

Title 296 WAC

LABOR AND INDUSTRIES

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- 296-350 Reassumption of jurisdiction pursuant to RCW 49.17.140.
- 296-400 Certification of competency for journeyman plumbers.
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DISPOSITION OF CHAPTERS FORMERLY CODIFIED IN THIS TITLE

Chapter 296-12

PRACTICE AND PROCEDURE--BOARD OF INDUSTRIAL INSURANCE APPEALS

[Rules filed 10/29/69, 10/29/65, 6/12/63, 3/23/60.] Now codified in Title 263 WAC.

Chapter 296-18

INDUSTRIAL INSURANCE AND MEDICAL AID CLASSIFICATION MANUAL

Reviser's note: The classification of occupations was enacted by the legislature as section 1, chapter 247, Laws of 1947. Such classifications were from time to time revised by the director pursuant to the authority contained in RCW 51.12.030, 51.12.040 and 51.16.100. As so revised they were reenacted by the legislature as chapter 51.20 RCW being part of chapter 23, Laws of 1961 which reenacted the entire industrial insurance title of RCW. The classification as originally published herein conforms to such 1961 statute. Added thereto in the departmental publication and reproduced herein is certain historical data indicating the original effective date of certain of the classifications. Also added by the director is the note following class 16-2. The effective date of chapter 23, Laws of 1961 was February 14, 1961.

Chapter 51.20 RCW and its parallels in chapter 231, Laws of 1961, have subsequently been repealed by section 39, chapter 93, Laws of 1972 ex. sess.

Sections 296-18-010, 296-18-020, 296-18-050, 296-18-060, 296-18-070, 296-18-080, 296-18-090, 296-18-100, 296-18-110, 296-18-130, 296-18-140, 296-18-150, 296-18-160, 296-18-170, 296-18-180, 296-18-210, 296-18-220, 296-18-240, 296-18-290, 296-18-310, 296-18-330, 296-18-350, 296-18-370, 296-18-380, 296-18-390, 296-18-400, 296-18-410, 296-18-420, 296-18-430, 296-18-440, 296-18-450, 296-18-460, 296-18-470, 296-18-480, 296-18-490, 296-18-500, 296-18-610, 296-18-620, 296-18-630, 296-18-640, 296-18-650, 296-18-660. [Order 71-14, §§ 296-18-010 thru 296-18-660, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74. See chapter 296-17 WAC.

296-18-340 [Order 70-11, § 296-18-340, filed 11/30/70.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.

296-18-600 [See Reviser's note for history.] Repealed by Order 71-14, filed 12/1/71, effective 1/1/72.

- 296-18-670 [Order 72-12, § 296-18-670, filed 7/18/72; Order 71-14, § 296-18-670, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74. See chapter 296-17 WAC.
- 296-18-680 [Order 72-12, § 296-18-680, filed 7/18/72; Order 71-14, § 296-18-680, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74. See chapter 296-17 WAC.
- 296-18-690 [Order 71-14, § 296-18-690, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74. See chapter 296-17 WAC.

Chapter 296-25

SAFETY STANDARDS--GENERAL

Sections 296-25-005, 296-25-010, 296-25-020, 296-25-030, 296-25-040, 296-25-050, 296-25-060, 296-25-070, 296-25-080, 296-25-090, 296-25-100, 296-25-110, 296-25-120, 296-25-130, 296-25-140, 296-25-200, 296-25-205, 296-25-210, 296-25-215, 296-25-220, 296-25-225, 296-25-230, 296-25-235, 296-25-240, 296-25-245, 296-25-250, 296-25-255, 296-25-260, 296-25-265, 296-25-270, 296-25-275, 296-25-280, 296-25-285, 296-25-290, 296-25-295, 296-25-300, 296-25-305, 296-25-310, 296-25-315, 296-25-320, 296-25-325, 296-25-330, 296-25-335, 296-25-340, 296-25-345, 296-25-350, 296-25-355, 296-25-360, 296-25-365, 296-25-370, 296-25-375, 296-25-380, 296-25-385, 296-25-390, 296-25-395, 296-25-400, 296-25-405, 296-25-410, 296-25-415, 296-25-420, 296-25-425, 296-25-430, 296-25-435, 296-25-440, 296-25-445, 296-25-450, 296-25-455, 296-25-460, 296-25-465, 296-25-470, 296-25-475, 296-25-480, 296-25-485, 296-25-490, 296-25-495, 296-25-500, 296-25-505, 296-25-510, 296-25-515, 296-25-520, 296-25-525, 296-25-530, 296-25-535, 296-25-540, 296-25-545, 296-25-550, 296-25-555, 296-25-560, 296-25-565, 296-25-570, 296-25-575, 296-25-580, 296-25-585, 296-25-590, 296-25-595, 296-25-600, 296-25-605, 296-25-610, 296-25-615, 296-25-620, 296-25-625, 296-25-630, 296-25-635, 296-25-640, 296-25-645, 296-25-650, 296-25-655, 296-25-660, 296-25-665, 296-25-670, 296-25-675, 296-25-680, 296-25-685, 296-25-690, 296-25-695, 296-25-700, 296-25-705, 296-25-710, 296-25-715, 296-25-720, 296-25-725, 296-25-730, 296-25-735, 296-25-740, 296-25-745, 296-25-750, 296-25-755, 296-25-760, 296-25-765, 296-25-770, 296-25-775, 296-25-780, 296-25-785, 296-25-790, 296-25-795, 296-25-800, 296-25-805, 296-25-810, 296-25-815, 296-25-820, 296-25-825, 296-25-830, 296-25-835, 296-25-840, 296-25-845, 296-25-850, 296-25-855, 296-25-860, 296-25-865, 296-25-870, 296-25-875, 296-25-880, 296-25-885, 296-25-890, 296-25-895, 296-25-900, 296-25-905, 296-25-910, 296-25-915, 296-25-920, 296-25-925, 296-25-930, 296-25-935, 296-25-940, 296-25-945, 296-25-950, 296-25-955, 296-25-960, 296-25-965, 296-25-970, 296-25-975. [Standards 1-152, filed 3/23/60.] Repeal of chapter 296-25 WAC was declared by Order 74-27, filed 5/7/74 to be effective upon the effective date of amendments to chapter 296-24 WAC set forth as part of this order. See chapter 296-24 WAC.

Chapter 296-26

LABOR CAMP RULES

- 296-26-010 Definitions. [Rule .60.010, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-020 Administration. [Rule .60.020, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-030 Water supply. [Rule .60.030, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-040 Sewage and liquid waste disposal--Existing and new construction. [Rule .60.040, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-050 Plumbing--Existing and new construction. [Rule .60.050, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-060 Refuse disposal--Existing and new construction. [Rule .60.060, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-070 Rodent and insect control--Existing and new construction. [Rule .60.070, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-080 Location and maintenance--Existing and new construction. [Rule .60.080, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.

- 296-26-090 Construction and maintenance of dwelling units. [Rule .60.090, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-100 Ventilation. [Rule .60.100, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-110 Heating—Existing and new construction. [Rule .60.110, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-120 Lighting. [Rule .60.120, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-130 Toilet, handwashing, bathing, and laundry facilities—Existing and new construction. [Rule .60.130, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-140 Foodhandling facilities—Existing and new construction. [Rule .60.140, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-150 Beds and bedding—Existing and new construction. [Rule .60.150, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-160 Supervision and responsibility. [Rule .60.160, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-170 Communicable disease. [Rule .60.170, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.
- 296-26-180 Effective date. [Rule .60.180, filed 3/29/61.] Repealed by Order 75-10, filed 4/4/75.

Chapter 296-38**CULINARY WORKERS SAFETY RULES**

- 296-38-010 General requirements. [Rule 1.010, filed 8/26/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-38-020 Equipment—Machinery. [Rule 2.010, filed 8/26/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-38-030 Fire protection and prevention. [Rule 3.010, filed 8/26/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-38-040 General working conditions. [Rules 4.010-4.040, filed 8/26/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-38-050 Illumination. [Rule 5.010, filed 8/26/63.] Repealed by Order 76-28, filed 9/28/76.

Chapter 296-40**SAFETY STANDARDS—CONSTRUCTION WORK**

- Sections 296-40-010, 296-40-015, 296-40-020, 296-40-030, 296-40-035, 296-40-040, 296-40-045, 296-40-050, 296-40-055, 296-40-060, 296-40-065, 296-40-070, 296-40-075, 296-40-080, 296-40-085, 296-40-090, 296-40-095, 296-40-100, 296-40-105, 296-40-110, 296-40-115, 296-40-120, 296-40-125, 296-40-130, 296-40-135, 296-40-140, 296-40-145, 296-40-150, 296-40-155, 296-40-160, 296-40-165, 296-40-170, 296-40-175, 296-40-180, 296-40-185, 296-40-190, 296-40-195, 296-40-200, 296-40-205, 296-40-210, 296-40-215, 296-40-220, 296-40-225, 296-40-230, 296-40-235, 296-40-240, 296-40-245, 296-40-250, 296-40-255, 296-40-260, 296-40-265, 296-40-270, 296-40-275, 296-40-280, 296-40-285, 296-40-290, 296-40-295, 296-40-300, 296-40-310, 296-40-320, 296-40-330, 296-40-350, 296-40-360, 296-40-365, 296-40-370, 296-40-375, 296-40-380, 296-40-385, 296-40-390, 296-40-395, 296-40-400, 296-40-410, 296-40-415, 296-40-420, 296-40-425, 296-40-430, 296-40-435, 296-40-440, 296-40-450, 296-40-460, 296-40-470, 296-40-480, 296-40-490, 296-40-500, 296-40-510, 296-40-520, 296-40-530, 296-40-540, 296-40-550, 296-40-560, 296-40-570, 296-40-580, 296-40-590, 296-40-600, 296-40-610, 296-40-620, 296-40-630, 296-40-640, 296-40-650, 296-40-660, 296-40-665, 296-40-670, 296-40-675, 296-40-680, 296-40-685, 296-40-690, 296-40-695, 296-40-700, 296-40-705, 296-40-710, 296-40-715, 296-40-720, 296-40-725, 296-40-730, 296-40-735, 296-40-740, 296-40-745, 296-40-750, 296-40-755, 296-40-760, 296-40-765, 296-40-770, 296-40-780, 296-40-790, 296-40-795, 296-40-800, 296-40-810, 296-40-820, 296-40-825, 296-40-830, 296-40-835, 296-40-840, 296-40-845, 296-40-850, 296-40-855, 296-40-860, 296-40-865, 296-40-870, 296-40-875, 296-40-880, 296-40-890, Appendix 1 Traffic control signs; Appendix 2 Sheet piling, shoring and bracing; and Appendix 3 Scaffolds. [Book entitled "Safety Standards for Construction Work" chapter 296-40 WAC, filed 3/23/60.] Repealed by Order 74-26, filed 5/7/74. For later promulgation, see chapter 296-155 WAC.

- 296-40-412 [Order 74-1, filed 1/8/74.] Repealed by Order 74-26, filed 5/7/74 before codification in the Washington Administrative Code See chapter 296-155 WAC, Safety Standards for Construction Work adopted by Order 74-26, filed 5/7/74.

Chapter 296-41**LIQUEFIED PETROLEUM GASES**

- The Standards for the Storage and Handling of Liquefied Petroleum Gases, N.B.F.U. #58, filed 3/29/61 was repealed by Order 76-28, filed 9/28/76.

Chapter 296-42**PETROLEUM—REFINING, TRANSPORTATION AND HANDLING**

- 296-42-010 Application, scope and permits for variations from orders. [§ 1, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-020 Definitions. [§ 2, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-030 Accident prevention program. [Rules 3.010-3.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-040 First aid. [Rule 4.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-050 Fire and explosions—Smoking, matches, lighters. [Rule 5.010, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-060 Fire and explosions—Fire protection and fire fighting equipment. [Rule 5.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-070 Fire and explosions—Cleaning oils. [Rule 5.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-080 Fire and explosions—Static electricity. [Rule 5.040, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-090 Fire and explosions—Spontaneous ignition. [Rule 5.050, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-100 Fire and explosions—Fire permits. [Rule 5.060, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-110 Fire and explosions—Surge tanks. [Rule 5.070, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-120 Fire and explosions—Flammable waste gases or vapors. [Rule 5.080, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-130 Fire and explosions—Transfer of light oils by air displacement. [Rule 5.090, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-140 Fire and explosions—Steam hose. [Rule 5.100, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-150 Dangerous exposure. [Rules 6.010 and 6.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-160 Enclosed and confined spaces—Ventilation. [Rule 7.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-170 Enclosed and confined spaces—Confined spaces. [Rule 7.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-180 Escape exits. [Rule 8.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-200 Tanks—Stationary tanks. [Rule 9.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-210 Tanks—Stationary tank maintenance. [Rule 9.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-220 Tanks—Diversion and retaining walls. [Rule 9.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-230 Gas and vapor testing. [Rule 10.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-240 Opening and blinding pipe lines and equipment—Opening pipe lines and equipment. [Rule 11.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.

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- 296-42-250 Opening and blinding pipe lines and equipment—Blinding of pipe lines and equipment. [Rule 11.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-260 Hazardous commodities—General. [Rule 12.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-270 Hazardous commodities—Corrosives. [Rule 12.020, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-280 Hazardous commodities—Leaded gasoline stationary tanks. [Rule 12.030, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-290 Drainage. [Rule 13.010, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-300 Agitation and heating of liquids in tanks. [Rule 14.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-310 Process equipment maintenance—General. [Rule 15.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-320 Process equipment maintenance—Condenser and cooling boxes. [Rule 15.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-330 Pumps, pipe lines and valves—Pumps. [Rule 16.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-340 Pumps, pipe lines and valves—Pipe lines and piping. [Rule 16.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-350 Pumps, pipe lines and valves—Valves. [Rule 16.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-360 Equipment leakage and breakage—Leakage control. [Rule 17.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-370 Equipment leakage and breakage—Gage glasses. [Rule 17.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-380 Equipment identification. [Rule 18.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-390 Gas compressors and engines—Gas compressor or gas processing plant protection. [Rule 19.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-400 Gas compressors and engines—Gas compressors. [Rule 19.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-410 Gas compressors and engines—Stationary internal combustion engines. [Rule 19.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-420 Loading and unloading facilities and operations—Loading platforms. [Rule 20.010, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-430 Loading and unloading facilities and operations—Loading and unloading operations. [Rule 20.020, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-440 Loading and unloading facilities and operations—Liquefied petroleum gases—Loading and unloading. [Rule 20.030, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-450 Laboratories and pilot plants. [Rule 21.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-460 Wharves. [Rule 22.010, filed 1/11/63.] Repealed by Order 76-28, filed 9/28/76.
- 296-42-470 Bulk distributing plants. [Rule 23.010, filed 1/11/63 and 1/15/63.] Repealed by Order 76-28, filed 9/28/76.

Chapter 296-51

AMMONIUM NITRATE PRECAUTIONS

- 296-51-010 Storage and handling of ammonium nitrate—Posting of caution placards. [Rule 1.010, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-020 Storage and handling of ammonium nitrate—General precautions. [Rule 1.020, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.

- 296-51-030 Storage and handling of ammonium nitrate—Storage of bags. [Rule 1.030, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-040 Storage and handling of ammonium nitrate—Storage in noncombustible type buildings. [Rule 1.040, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-050 Storage and handling of ammonium nitrate—Open lights or flame. [Rule 1.050, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-060 Storage and handling of ammonium nitrate—Bag handling. [Rule 1.060, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-070 Storage and handling of ammonium nitrate—Loosening of caked ammonium nitrate. [Rule 1.070, effective 11/1/62; § 2, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-100 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Mixing with sensitizing materials. [Rule 2.010, effective 11/1/62; Rule 6f1, filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-110 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Marking of bags or containers. [Rule 2.020, effective 11/1/62; Rule 6f2, filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-120 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Storage of raw ammonium nitrate. [Rule 2.030, effective 11/1/62; § 1b, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-130 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Open drains and piping—Warehouse floors. [Rule 2.040, effective 11/1/62; § 3a, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-140 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Floors in processing plant. [Rule 2.050, effective 11/1/62; Rule 3b, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-150 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Fuel storage. [Rule 2.060, effective 11/1/62; Rule 1c and 3b, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-160 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Heat. [Rule 2.070, effective 11/1/62; Rule 3d, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-170 Processing plant for sensitizing ammonium nitrate operation and storage requirements—Smoking. [Rule 2.080, effective 11/1/62; Rule 3j, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-180 Processing plant for sensitizing ammonium nitrate operation and storage requirements—One day's production. [Rule 2.090, effective 11/1/62; Rule 3f, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-200 General provisions—Unusual compositions. [Rule 3.010, effective 11/1/62; Rule 3e, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-210 General provisions—Mixing for above ground use at jobsite. [Rule 3.020, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-220 General provisions—Ammonium nitrate bag accumulation prohibited. [Rule 3.030, effective 11/1/62; § 3k, filed 8/8/60 and 5/1/62; § 6e(3a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-230 General provisions—Cleanliness. [Rule 3.040, effective 11/1/62; Rule 3l, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-240 General provisions—Proper stacking. [Rule 3.050, effective 11/1/62; Rule 3m, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.

- 296-51-250 General provisions—Mobile equipment. [Rule 3.060, effective 11/1/62; Rule 4a, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-260 General provisions—Volatile fuels. [Rule 3.070, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-270 General provisions—Crude oil and crankcase oil prohibited. [Rule 3.080, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-280 General provisions—Misfires (other than underground). [Rule 3.090, effective 11/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-300 General storage requirements—Standard magazine construction. [Rule 4.010, effective 11/1/62; Rule 3h, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-310 General storage requirements—Calculation of distance limitations. [Rule 4.020, effective 11/1/62; § 1a, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-320 General storage requirements—Storage of processed compositions. [Rule 4.030, effective 11/1/62; § 1d, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-330 General storage requirements—Ventilation of storage areas. [Rule 4.040, effective 11/1/62; § 3c, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-340 General storage requirements—Storage in vans. [Rule 4.050, effective 11/1/62; Rule 3g, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-350 General storage requirements—Storage van requirements. [Rule 4.060, effective 11/1/62; Rule 3i, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-360 General storage requirements—Limitation of amount of fuel sensitized ammonium nite at blasting site. [Rule 4.070, effective 11/1/62; § 5a, filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-400 Underground blasting operations—Permit required—Must be renewed annually—Posted on premises. [Rule 5.010, effective 11/1/62; § 6e, filed 8/8/60; § 6e, filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-410 Underground blasting operations—Rating of blasting agents. [Rule 5.020, effective 11/1/62; § 6f, filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-420 Underground blasting operations—Loading of holes. [Rule 5.030, effective 11/1/62; § 6e(1a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-430 Underground blasting operations—Priming. [Rule 5.040, effective 11/1/62; § 6a, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-440 Underground blasting operations—Grounding. [Rule 5.050, effective 11/1/62; § 6e(2a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-450 Underground blasting operations—Firing. [Rule 5.060, effective 11/1/62; § 6e(5a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-460 Underground blasting operations—Misfire. [Rule 5.070, effective 11/1/62; § 6b & 6c, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-470 Underground blasting operations—Fumes. [Rule 5.080, effective 11/1/62; § 6d, filed 8/8/60 and 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-480 Underground blasting operations—Wet holes. [Rule 5.090, effective 11/1/62; § 6e(4a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 296-51-490 Underground blasting operations—Liners prohibited. [Rule 5.100, effective 11/1/62; § 6e(4a), filed 5/1/62.] Repealed by Order 76-28, filed 9/28/76.
- 100, 296-53-110. [Paragraphs I through XI, effective 8/1/52, filed 3/23/60.] Repealed by Order 68-6, filed 10/24/68, effective 12/1/68.
- 296-53-200 Scope. [Order 68-6, § 296-53-200, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-210 Purpose. [Order 68-6, § 296-53-210, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-220 Exception. [Order 68-6, § 296-53-220, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-230 References to other codes. [Order 68-6, § 296-53-230, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-240 Effective date. [Order 68-6, § 296-53-240, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-250 Definitions. [Order 68-6, § 296-53-250, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-260 Design requirements—High velocity tools. [Order 68-6, § 296-53-260, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-270 Low velocity piston tools. [Order 68-6, § 296-53-270, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-280 Hammer-operated piston tools—Low velocity type. [Order 68-6, § 296-53-280, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-290 Requirements for loads and fasteners. [Order 68-6, § 296-53-290, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-300 Approvals. [Order 68-6, § 296-53-300, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-310 Operation. [Order 68-6, § 296-53-310, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-320 Servicing. [Order 68-6, § 296-53-320, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-330 Qualification and certification of operators. [Order 68-6, § 296-53-330, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-340 Storage of explosive-actuated tools, instruction books, cleaning kits, and tools. [Order 68-6, § 296-53-340, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.
- 296-53-350 Use low velocity tools when possible. [Order 68-6, § 296-53-350, filed 10/24/68, effective 12/1/68.] Repealed by Order 75-12, filed 4/4/75.

Chapter 296-58

SAFETY STANDARDS—METALS INDUSTRY

Chapter 296-53
SAFETY REQUIREMENTS FOR EXPLOSIVE-ACTUATED
FASTENING TOOLS

Sections 296-53-010, 296-53-020, 296-53-030, 296-53-040, 296-53-050, 296-53-060, 296-53-070, 296-53-080, 296-53-090, 296-53-

- 296-58-001 Foreword. [Foreword, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-004 Practical application of standards. [Practical Application Paragraphs, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-010 Safe place standards. [Standard 1, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-015 Safe practice standards. [Standard 2, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-020 Standard safeguard defined. [Standard 3, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-025 Approved. [Standard 4, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.

Title 296 WAC

Title 296 WAC: Labor and Industries

- 296-58-030 Substantial. [Standard 5, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-035 Exposed to contact. [Standard 6, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-040 Warning placards. [Standard 7, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-045 Wooden guards. [Standard 8, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-050 Metal guards—Framework. [Standard 9, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-055 Standard railings. [Standard 10, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-060 Fillers. [Standard 11, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-065 Filling material for metal guards. [Standard 12, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-070 Safeguards must not admit rod or pipes. [Standard 13, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-075 Lighting and illumination. [Standard 14, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-080 Diffusion and distribution of artificial and natural light. [Standard 15, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-085 Foundations. [Standard 16, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-090 Housekeeping. [Standard 17, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-095 Plant location. [Standard 18, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-100 Power transmission equipment and machine parts. [Standard 19, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-105 Saw guarding (metal and wood). [Standard 20, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-110 Machine power control. [Standard 21, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-115 Loose pulleys and cone pulleys. [Standard 22, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-120 Exposure to harmful atmospheric conditions and exposure to harmful materials. [Standard 23, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-125 Nontoxic dusts. [Standard 24, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-130 Methods of control. [Standard 25, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-135 Minimum general requirements for electrical safety. [Standard 26, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-140 Helpers around machines shall receive instructions. [Standard 27, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-145 Machines shall be stopped in making repairs. [Standard 28, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-150 Torn and loose clothing. [Standard 29, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-155 Personal protective equipment and clothing. [Standard 30, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-160 Sterilization of equipment. [Standard 31, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-165 Caps or other head covering. [Standard 32, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-170 Prevention of industrial disease. [Standard 33, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-175 Carbon monoxide gas. [Standard 34, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-180 Acids and chemicals. [Standard 35, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-185 Steam pipes. [Standard 36, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-190 Hot liquid vats—Location of. [Standard 37, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-195 Vats and tanks guarded. [Standard 38, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-200 Building—Floors. [Standard 39, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-205 Stairways. [Standard 40, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-210 Fire escapes. [Standard 41, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-215 Swinging doors—Windows required. [Standard 42, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-220 Doorways near railroad tracks and roadways. [Standard 43, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-225 Platforms and runways. [Standard 44, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-230 Floor openings. [Standard 45, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-235 Trestles and walks in industrial plants. [Standard 46, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.

- 296-58-240 Hoistways. [Standard 47, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-245 Elevators. [Standard 48, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-250 Conveyors. [Standard 49, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-255 Revolving drums and cylinders. [Standard 50, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-260 Means to prevent slipping. [Standard 51, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-265 Polishing and buffing wheels. [Standard 52, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-270 Cranes and hoists definitions. [Standard 53, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgations, see chapter 296-61 WAC.
- 296-58-275 All cranes—Construction. [Standard 54, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-280 All cranes—Electrical equipment. [Standard 55, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-285 All cranes—Chains and wire rope. [Standard 56, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-290 All cranes—Floor operated cranes. [Standard 57, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-295 All cranes—Operators. [Standard 58, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-300 All cranes—Signalmen. [Standard 59, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-305 All cranes—Repairmen. [Standard 60, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-310 All cranes—Construction requirements. [Standard 61, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-315 All cranes—Platforms and footwalks. [Standard 62, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-320 All cranes—Cages. [Standard 63, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-325 All cranes—Rail stops, bumpers and fenders. [Standard 64, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-330 Special requirements for gantry cranes. [Standard 65, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-335 Requirements for A-frames, mobile cranes and excavation equipment, loaders, and locomotive cranes and equipment. [Standard 66, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-340 Construction, operation and maintenance—Chain and electric hoists. [Standard 67, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-345 Construction, operation and maintenance—Monorail hoists. [Standard 68, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-350 Construction, operation and maintenance—Air hoists. [Standard 69, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-355 Jib, pillar, and portable floor cranes, crabs and winches. [Standard 70, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-360 Fibre rope. [Standard 71, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-365 Wire rope clamps—Thimbles—Sheaves. [Standard 72, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-370 Wire rope slings, hooks. [Standard 73, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-375 Ladles and crucibles. [Standard 74, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-380 Molding and casting areas. [Standard 75, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-385 Drop guarding. [Standard 76, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 297-58-390 Wet materials. [Standard 77, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-395 Explosive materials. [Standard 78, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-400 Material storage. [Standard 79, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-405 Shears. [Standard 80, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-410 Power vehicles. [Standard 81, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-415 Sanitation. [Standard 82, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-420 Washroom and locker. [Standard 83, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-425 Grinding wheels. [Standard 84, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-430 Spray rooms, spray booths, etc. [Standard 85, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-435 Care and use of ladders. [Standard 86, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-440 Fixed ladders. [Standard 87, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-445 Ladder cage. [Standard 88, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.

Title 296 WAC

Title 296 WAC: Labor and Industries

- 296-58-450 Landings. [Standard 89, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-455 Machine, forging and metalworking shops. [Standard 90, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.
- 296-58-460 Power presses and drop hammers. [Standard 91, effective 6/1/55, filed 3/23/60.] Repealed by Order 76-7, filed 3/1/76. For later promulgation, see chapter 296-61 WAC.

Chapter 296-60

SAFETY STANDARDS--METALLIC AND NONMETALLIC MINES

- Sections 296-60-010, 296-60-015, 296-60-020, 296-60-025, 296-60-030, 296-60-035, 296-60-040, 296-60-045, 296-60-050, 296-60-055, 296-60-060, 296-60-065, 296-60-070, 296-60-075, 296-60-080, 296-60-085, 296-60-090, 296-60-095, 296-60-100, 296-60-105, 296-60-110, 296-60-115, 296-60-120, 296-60-125, 296-60-130, 296-60-135, 296-60-140, 296-60-145, 296-60-150, 296-60-155, 296-60-160, 296-60-165, 296-60-166, 296-60-170, 296-60-175, 296-60-180, 296-60-185, 296-60-190, 296-60-195, 296-60-200, 296-60-205, 296-60-210, 296-60-215, 296-60-220, 296-60-225, 296-60-230, 296-60-235, 296-60-240, 296-60-245, 296-60-250, 296-60-255, 296-60-260, 296-60-265, 296-60-268, 296-60-270, 296-60-275, 296-60-280, 296-60-285, 296-60-290, 296-60-295, 296-60-300, 296-60-305, 296-60-310, 296-60-315, 296-60-320, 296-60-325, 296-60-330, 296-60-335, 296-60-340, 296-60-345, 296-60-350, 296-60-355, 296-60-358, 296-60-360, 296-60-365, 296-60-370, 296-60-375, 296-60-380, 296-60-385. [Rules, filed 3/23/60, effective 5/1/48.] Repealed by Order 72-1, filed 2/25/72, effective 4/1/72.

Chapter 296-66

SAFETY STANDARDS--PAINTING AND DECORATING INDUSTRY

- 296-66-005 Foreword. [Foreword, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-010 Safety educational standards—Introduction. [§ A-1, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-015 Safety educational standards—Management's responsibility. [§ A-2, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-020 Safety educational standards—Employee's responsibility. [§ A-3, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-025 Safety educational standards—Safety inspector plan. [§ A-4, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-030 Safety educational standards—Settlement of disputes. [§ A-5, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-035 Safety educational standards—Safety committee plan. [§ A-6, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-040 Safety educational standards—Settlement of disputes. [§ A-7, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-045 Safety educational standards—Safety educational report. [§ A-8, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-050 Safety educational standards—Safety bulletin board. [§ A-9, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-055 Safety educational standards—Minimum requirements for first aid. [§ A-9, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-060 Safety educational standards—First aid kit. [§ A-11, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-065 Safety educational standards—First aid room. [§ A-12 (part), effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.

- 296-66-070 Safety educational standards—Conclusion—Approval for changes. [§ A-12 (part), effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-080 Ladders and scaffolds—Purpose and application. [Ladder and scaffold rules (part), effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-085 Ladders and scaffolds—Definitions. [Ladder and scaffold definitions, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-090 Ladders and scaffolds—General requirements. [§§ B-1 through B-27, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-095 Ladders and scaffolds—Built-up wood scaffolds. [§§ C-1 through C-8, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-100 Ladders and scaffolds—Factory-built scaffold units. [§ D-1, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-105 Ladders and scaffolds—Tubular post scaffolds. [§§ E-1 through E-15, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-110 Ladders and scaffolds—Swinging scaffolds—Construction. [§§ F-1 through F-27, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-115 Ladders and scaffolds—General requirements for swinging scaffolds. [§§ G-1 through G-18, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-120 Ladders and scaffolds—Needle beam scaffolds. [§§ H-1 through H-21, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-125 Ladders and scaffolds—Horse scaffold. [§§ I-1 through I-21, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-130 Ladders and scaffolds—Plasterers' and decorators' inside scaffolds. [§§ J-1 through J-17, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-135 Ladders and scaffolds—Interior hung scaffolds. [§§ J-18 through J-24, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-140 Ladders and scaffolds—Window jack scaffolds. [§§ K-1 through K-6, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-145 Ladders and scaffolds—Crawling boards or chicken ladders. [§§ L-1 through L-6, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-150 Ladders and scaffolds—Ladder supported scaffolds. [§§ M-1 through M-9, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-155 Ladders and scaffolds—Ladder specifications—Definitions. [Definitions for ladder specifications, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-160 Ladders and scaffolds—Ladder material. [§ N-1, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-165 Ladders and scaffolds—Step ladders. [§ N-2, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-170 Ladders and scaffolds—Single ladders. [§ N-3, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-175 Ladders and scaffolds—Extension ladders. [§ N-4, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-180 Ladders and scaffolds—Trestle and extension ladders. [§ N-5, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-185 Ladders and scaffolds—Painter's ladder. [§ N-6, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-190 Ladders and scaffolds—Extension trestles. [§ N-7, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.

- 296-66-195 Ladders and scaffolds—Metal ladders. [§ N-8, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-200 Testing scaffold planks and stringers. [§§ O-1 through O-4, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-205 Care and use of ladders. [§§ P-1 through P-31, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-210 Roofing brackets. [§§ Q-1 and Q-2, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-215 Boatswain's chair. [§§ R-1 through R-6, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-220 Life nets—Safety belts—Life lines. [§§ S-1 through S-5, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-225 Application of paint coating—General. [Paint Coating Rules (part), effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-230 Application of paint coating—Definitions. [Paint coating definitions, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-235 Spray coating of buildings, structures and outdoor spraying—Scope of rules. [Scope of spray coating rules, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-240 Spray coating of buildings, structures and outdoor spraying—Equipment. [§§ T-1 and T-2, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-245 Spray coating of buildings, structures and outdoor spraying—Operation. [§§ U-1 through U-12, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-250 Spray coating of buildings, structures and outdoor spraying—Protection of person. [§§ V-1 through V-14, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-255 Coating operations inside of buildings. [§§ W-1 through W-7, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-260 Electrical equipment. [§§ X-1 through X-17, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-265 Air supply. [§§ Y-1 through Y-3, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-270 Operation. [§§ Z-1 through Z-3, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- 296-66-275 Maintenance. [§§ AA-1 through AA-5, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.
- Appendix Illustrations 1 thru 10 [Appendix, effective 11/1/48, filed 3/23/60.] Repealed by Order 76-29, filed 9/30/76.

Chapter 296-68**SAFETY STANDARDS—POWER PROPELLED TRUCKS**

- 296-68-005 Preface. [Preface, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-010 Use of intoxicants. [Rule A-1, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-015 Employer's responsibility. [Rules B-1 through B-3, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-020 Foreman's responsibility. [Rules C-1 through C-3, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-025 Workman's responsibility. [Rules D-1 and D-2, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-030 State inspector. [Rules E-1 and E-2, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.

- 296-68-035 Safety meetings. [Rules F-1 through F-4, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-040 First aid instruction and treatment of injured. [Rules G-1 through G-3, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.
- 296-68-045 Safety standards—Relating to the use of power-propelled trucks used principally in warehouses and docks (housed)—Construction of equipment and operation thereof. [Rules 1 through 16, effective 4/1/38.] Repealed by Order 75-13, filed 4/4/75.

Chapter 296-70**TUNNELS, SHAFTS AND SUBWAYS—SAFETY STANDARDS**

- 296-70-010 Definitions. [Part I, Definitions, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-020 Safety miner. [§ A, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-030 Minimum first aid requirements. [§ B, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-040 Fire protection. [§ C, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-050 Safe practice standards. [Subsecs. D-1—D-30, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-060 Personal protective equipment and clothing. [Subsecs. D-31—D-34, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-070 Rock dust. [§ E, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-080 Ventilation. [§ F, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-090 Protection against atmospheric containments. [§ G, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-100 Shaft protection. [§ H, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-110 Ladders and stairways. [§ I, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-120 Hoisting engineer. [§ J, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-130 Hoisting. [§ K, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-140 Hoisting ropes. [§ L, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-150 Signals and means of communication. [§ M, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-160 Blasting. [§ N, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-170 Timbering. [§ O, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-180 Lighting. [§ P, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-190 Electrical equipment. [§ Q, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-200 Use of fuel burning equipment in underground work and other enclosed areas. [§ R, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-210 Sumps. [§ S, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.
- 296-70-220 Sanitation. [§ T, filed 3/29/61.] Repealed by Order 76-29, filed 9/30/76.

Chapter 296-74**ANHYDROUS AMMONIA**

- 296-74-010 Tanks. [Rules (part), filed 3/29/61.] Repealed by Order 75-9, filed 4/4/75.
- 296-74-020 Electrical. [Rules (part), filed 3/29/61.] Repealed by Order 75-9, filed 4/4/75.
- 296-74-030 Personnel protection. [Rules (part), filed 3/29/61.] Repealed by Order 75-9, filed 4/4/75.

Chapter 296-76**SAFETY STANDARDS—QUARRY OPERATIONS**

- Sections 296-76-005, 296-76-010, 296-76-015, 296-76-020, 296-76-025, 296-76-030, 296-76-035, 296-76-040, 296-76-045, 296-76-050, 296-76-055, 296-76-060, 296-76-065, 296-76-070, 296-76-

075, 296-76-080, 296-76-085, 296-76-090, 296-76-095, 296-76-100, 296-76-105, 296-76-110, 296-76-115, 296-76-120, 296-76-125. [Rules, filed 3/29/61, effective 8/1/42.] Repealed by Order 72-1, filed 2/25/72, effective 4/1/72.

Chapter 296-150

FACTORY BUILT HOUSING AND GOVERNOR'S ADVISORY BOARD ADMINISTRATIVE RULES

- 296-150-010 Administration—Authority for factory-built housing code. [Order 73-25, § 296-150-010, filed 12/3/73; Order 71-1, § 296-150-010, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-015 Application and scope. [Order 73-25, § 296-150-015, filed 12/3/73; Order 71-1, § 296-150-015, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-020 Department services. [Order 73-25, § 296-150-020, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-025 Conditions of reciprocity. [Order 74-10, § 296-150-025, filed 4/8/74; Order 73-13, § 296-150-025, filed 7/31/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-026 Agreements with out-of-state jurisdictions. [Order 73-25, § 296-150-026, filed 12/3/73; Order 73-13, § 296-150-026, filed 7/31/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-027 Educational. [Order 73-25, § 296-150-027, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-050 Definitions—General. [Order 73-25, § 296-150-050, filed 12/3/73; Order 71-1, § 296-150-050, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-055 Definitions—A. Agency inspection. [Order 71-1, § 296-150-055, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-060 Definitions—Agency, listing. [Order 71-1, § 296-150-060, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-065 Definitions—Agency, testing. [Order 71-1, § 296-150-065, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-070 Definitions—Alteration or conversion. [Order 71-1, § 296-150-070, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-075 Definitions—Approved. [Order 71-1, § 296-150-075, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-080 Definitions—B. Building site. [Order 71-1, § 296-150-080, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-085 Definitions—C. Custom building. [Order 71-1, § 296-150-085, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-090 Definitions—D. Department. [Order 71-1, § 296-150-090, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-095 Definitions—Dwelling units. [Order 71-1, § 296-150-095, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-100 Definitions—E. Equipment. [Order 71-1, § 296-150-100, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-105 Definitions—F. Factory built housing (F.B.H.). [Order 71-1, § 296-150-105, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-110 Definitions—Field technical service. [Order 71-1, § 296-150-110, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-115 Definitions—First user. [Order 71-1, § 296-150-115, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-120 Definitions—G. No definition. [Order 71-1, § 296-150-120, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-130 Definitions—H. Habitable room. [Order 71-1, § 296-150-130, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-140 Definitions—I. Insignia. [Order 71-1, § 296-150-140, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-145 Definitions—Install. [Order 71-1, § 296-150-145, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-150 Definitions—J. No definition. [Order 71-1, § 296-150-150, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-160 Definitions—K. No definition. [Order 71-1, § 296-150-160, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-170 Definitions—L. Labeled. [Order 71-1, § 296-150-170, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-175 Definitions—Listed. [Order 71-1, § 296-150-175, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-180 Definitions—Local enforcement agency. [Order 71-1, § 296-150-180, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-185 Definitions—M. Manufacture. [Order 71-1, § 296-150-185, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-190 Definitions—N. No definition. [Order 71-1, § 296-150-190, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-200 Definitions—O. No definition. [Order 71-1, § 296-150-200, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-210 Definitions—P. No definition. [Order 71-1, § 296-150-210, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-220 Definitions—Q. No Definition. [Order 71-1, § 296-150-220, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-230 Definitions—R. Residential building. [Order 71-1, § 296-150-230, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-240 Definitions—S. Substantially prefabricated or assembled. [Order 71-1, § 296-150-240, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-245 Definitions—System. [Order 71-1, § 296-150-245, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-250 Definitions—T. No definition. [Order 71-1, § 296-150-250, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-260 Definitions—U. No definition. [Order 71-1, § 296-150-260, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-270 Definitions—V. No definition. [Order 71-1, § 296-150-270, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-280 Definitions—W. No definition. [Order 71-1, § 296-150-280, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-290 Definitions—X. No definition. [Order 71-1, § 296-150-290, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-300 Definitions—Y. No definition. [Order 71-1, § 296-150-300, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-310 Definitions—Z. No definition. [Order 71-1, § 296-150-310, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-315 Construction requirements. [Order 73-25, § 296-150-315, filed 12/3/73; Order 71-1, § 296-150-315, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-320 Electrical requirements. [Order 75-5, § 296-150-320, filed 3/5/75; Order 73-25, § 296-150-320, filed 12/3/73; Order 71-1, § 296-150-320, filed 2/11/71.]

- Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-325 Mechanical requirements. [Order 73-25, § 296-150-325, filed 12/3/73; Order 71-1, § 296-150-325, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-330 Plumbing requirements. [Order 73-25, § 296-150-330, filed 12/3/73; Order 71-1, § 296-150-330, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-335 Code research and materials evaluation service. [Order 73-25, § 296-150-335, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-400 Enforcement and administration—Enforcement. [Order 71-1, § 296-150-400, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-405 Enforcement and administration—Equipment and systems. [Order 71-1, § 296-150-405, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-410 Enforcement and administration—Department disapproval of listed or labeled equipment and systems. [Order 71-1, § 296-150-410, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-415 Alternates and equivalents. [Order 73-25, § 296-150-415, filed 12/3/73; Order 71-1, § 296-150-415, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-420 Inspections. [Order 73-25, § 296-150-420, filed 12/3/73; Order 71-1, § 296-150-420, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-423 Compliance control programs (CC). [Order 73-25, § 296-150-423, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-424 Factory-built housing—Compliance control (FBH-CC). [Order 73-25, § 296-150-424, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-425 Local enforcement agency—Compliance control (LEA-CC). [Order 73-25, § 296-150-425, filed 12/3/73; Order 71-1, § 296-150-425, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-430 Local enforcement agency application. [Order 73-25, § 296-150-430, filed 12/3/73; Order 71-1, § 296-150-430, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-435 Rights of local enforcement agency. [Order 73-25, § 296-150-435, filed 12/3/73; Order 71-1, § 296-150-435, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-440 The local enforcement agency responsibility. [Order 73-25, § 296-150-440, filed 12/3/73; Order 71-1, § 296-150-440, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-445 Manufacturer compliance control (M-CC). [Order 73-25, § 296-150-445, filed 12/3/73; Order 71-1, § 296-150-445, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-450 Independent inspection agency compliance control (IIA-CC). [Order 73-25, § 296-150-450, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-500 Design plan approval—General. [Order 73-25, § 296-150-500, filed 12/3/73; Order 71-1, § 296-150-500, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-505 Design plan approval application. [Order 73-25, § 296-150-505, filed 12/3/73; Order 71-1, § 296-150-505, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-506 Design plan types and descriptions. [Order 73-25, § 296-150-506, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-510 Engineering and test procedures. [Order 73-25, § 296-150-510, filed 12/3/73; Order 71-1, § 296-150-510, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-515 Design plan requirements. [Order 73-25, § 296-150-515, filed 12/3/73; Order 71-1, § 296-150-515, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-516 Technical report. [Order 73-25, § 296-150-516, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-520 Technical report—Live loads. [Order 71-1, § 296-150-520, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-525 Manufacturing in more than one location. [Order 73-25, § 296-150-525, filed 12/3/73; Order 71-1, § 296-150-525, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-530 Out-of-state applicant. [Order 73-25, § 296-150-530, filed 12/3/73; Order 71-1, § 296-150-530, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-535 Out-of-state applicant—Nonconforming application and plans. [Order 71-1, § 296-150-535, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-540 Manufacturers evidence of department approval. [Order 73-25, § 296-150-540, filed 12/3/73; Order 71-1, § 296-150-540, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-545 Design plan approval expiration. [Order 73-25, § 296-150-545, filed 12/3/73; Order 71-1, § 296-150-545, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-550 Revocation of approval. [Order 73-25, § 296-150-550, filed 12/3/73; Order 71-1, § 296-150-550, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-555 Changes to approved plans. [Order 73-25, § 296-150-555, filed 12/3/73; Order 71-1, § 296-150-555, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-560 Transfer of approvals. [Order 73-25, § 296-150-560, filed 12/3/73; Order 71-1, § 296-150-560, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-565 Change of name and address. [Order 73-25, § 296-150-565, filed 12/3/73; Order 71-1, § 296-150-565, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-570 Discontinuance of manufacture. [Order 73-25, § 296-150-570, filed 12/3/73; Order 71-1, § 296-150-570, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-575 Existing approvals. [Order 73-25, § 296-150-575, filed 12/3/73; Order 71-1, § 296-150-575, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-580 Compliance. [Order 73-25, § 296-150-580, filed 12/3/73; Order 71-1, § 296-150-580, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-585 Design plan approval—Custom building. [Order 71-1, § 296-150-585, filed 2/11/71.] Repealed by Order 73-25, filed 12/3/73.
- 296-150-590 Field erection. [Order 73-25, § 296-150-590, filed 12/3/73; Order 71-1, § 296-150-590, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-595 Proprietary material. [Order 73-25, § 296-150-595, filed 12/3/73; Order 71-1, § 296-150-595, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-600 Insignia—Insignia required. [Order 71-1, § 296-150-600, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.

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- 296-150-605 Application for insignia. [Order 73-25, § 296-150-605, filed 12/3/73; Order 71-1, § 296-150-605, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-606 Agreement of work completion (AWC). [Order 73-25, § 296-150-606, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-610 Alteration or conversion. [Order 73-25, § 296-150-610, filed 12/3/73; Order 71-1, § 296-150-610, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-615 Alteration or conversion—Denial of insignia. [Order 71-1, § 296-150-615, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-620 Alteration or conversion—Insignia removal. [Order 71-1, § 296-150-620, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-625 Lost or damaged insignia. [Order 73-25, § 296-150-625, filed 12/3/73; Order 71-1, § 296-150-625, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-630 Custom building. [Order 73-25, § 296-150-630, filed 12/3/73; Order 71-1, § 296-150-630, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-640 Unauthorized use. [Order 73-25, § 296-150-640, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-650 Unit identification. [Order 73-25, § 296-150-650, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-675 Components. [Order 73-25, § 296-150-675, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-680 Components application. [Order 73-25, § 296-150-680, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-685 Components approval. [Order 73-25, § 296-150-685, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-690 Components testing. [Order 73-25, § 296-150-690, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-695 Components fees and production reports. [Order 73-25, § 296-150-695, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-700 Fee schedule. [Order 73-25, § 296-150-700, filed 12/3/73; Order 71-1, § 296-150-700, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-800 Hearings—Public hearing. [Order 71-1, § 296-150-800, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-805 Hearings—Board of appeals. [Order 71-1, § 296-150-805, filed 2/11/71.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.

GOVERNOR'S ADVISORY BOARD ADMINISTRATIVE RULES**WAC 296-150-815—296-150-875**

- 296-150-815 Foreword. [Order 73-25, § 296-150-815, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-820 Definitions. [Order 73-25, § 296-150-820, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-825 Officers. [Order 73-25, § 296-150-825, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-830 Internal management. [Order 73-25, § 296-150-830, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-835 Duties. [Order 73-25, § 296-150-835, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.

- 296-150-840 Hearings. [Order 73-25, § 296-150-840, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-845 Appearance and practice before the board. [Order 73-25, § 296-150-845, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-850 Solicitation of business unethical. [Order 73-25, § 296-150-850, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-855 Standards of ethical conduct. [Order 73-25, § 296-150-855, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-860 Appearance by former employee. [Order 73-25, § 296-150-860, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-865 Former employee as expert witness. [Order 73-25, § 296-150-865, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-870 Computation of time. [Order 73-25, § 296-150-870, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.
- 296-150-875 Administrative procedures act. [Order 73-25, § 296-150-875, filed 12/3/73.] Repealed by Order 77-8, filed 4/29/77, effective 6/1/77.

Chapter 296-04 WAC**INTERNAL RULES—STATE APPRENTICESHIP AND TRAINING COUNCIL****AFFIRMATIVE ACTION PLAN OF THE WASHINGTON STATE APPRENTICESHIP COUNCIL TO PROMOTE EQUAL EMPLOYMENT OPPORTUNITY IN APPRENTICESHIP AND TRAINING****WAC****INTERNAL RULES**

- 296-04-001 Foreword.
- 296-04-005 Apprenticeship and training agreements—Proposed standards.
- 296-04-010 Regular meetings.
- 296-04-015 Definitions.
- 296-04-040 Council meetings—When held—Notice—Who may attend—Quorum.
- 296-04-045 Supervisor—administrator of council.
- 296-04-050 Plant program defined.
- 296-04-060 Officers, appointment, duties—Ex-officio members.
- 296-04-090 Rules of order.
- 396-04-105 Retroactivity.
- 296-04-115 Amendment.
- 296-04-125 Rule change—procedures and forms.
- 296-04-160 Apprenticeship committees.
- 296-04-260 Merit awards.
- 296-04-270 Apprenticeship agreements—Types—Standards—Registration, review, cancellation, re-registration—Certificate of completion.
- 296-04-280 On-the-job-training programs.
- 296-04-290 Appeal procedure.
- AFFIRMATIVE ACTION PLAN**
- 296-04-300 Promulgation.
- 296-04-310 Authority.
- 296-04-320 Definitions.
- 296-04-330 Equal opportunity standards.
- 296-04-340 Affirmative action plans.
- 296-04-350 Selection of apprentices.
- 296-04-351 Employer's responsibility.
- 296-04-360 Existing lists of eligibles and public notice.
- 296-04-370 Records.
- 296-04-380 Compliance reviews.
- 296-04-390 Noncompliance with federal and state equal opportunity requirements.
- 296-04-400 Complaint procedure.
- 296-04-410 Adjustments in schedule for compliance.

296-04-420 Sanctions.
 296-04-430 Reinstatement of program registration.
 296-04-440 Adoption of consistent state plans.
 296-04-460 Intimidatory or retaliatory acts.
 296-04-470 Nondiscrimination.
 296-04-480 Exemptions.
 296-04-490 Appeal.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-04-020 Special meetings [§ II, filed 3/23/60.] See WAC 296-04-030(1). This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-030 Executive meetings. [§§ III & IV, filed 10/11/65; §§ III & IV, filed 2/12/65; § II A, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-040.

296-04-050 Minutes of meetings. [§ VI, filed 10/11/65; § VI, filed 2/12/65; § IV, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-060.

296-04-070 Ex officio members. [§ VIII, filed 10/11/65; § VIII, filed 2/12/65; § V A, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-060.

296-04-080 Agencies consulted. [§ IX, filed 10/11/65; § IX, filed 2/12/65; § V B, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-060.

296-04-100 Official action. [§ XI, filed 10/11/65; § XI, filed 2/12/65; § VI A, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71.

296-04-110 Interim action. [§ VI B, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-120 Duration of and change of policies. [§ VII, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-130 Submission of petitions and requests. [§ XIV, filed 10/11/65; § XIV, filed 2/12/65; § VIII, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-040.

296-04-140 Where matters sent. [§ XV, filed 10/11/65; § XV, filed 2/12/65; § VIII A, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-045.

296-04-150 Delegation to director of apprenticeship. [§ IX, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-170 Program deviation from approved standards. [§ XVII, filed 10/11/65; § XVII, filed 2/12/65; § X B, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-270.

296-04-180 Program cancellation. [§ XVIII, filed 10/11/65; § XVIII, filed 2/12/65; § X C, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-270.

296-04-190 Effect of program cancellation. [§ XIX, filed 10/11/65; § XIX, filed 2/12/65; § X D, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-270.

296-04-195 Proposed programs must conform to council standards. [§ XX, filed 10/11/65; § XX, filed 2/12/65.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-270.

296-04-200 Certificates of completion. [§ XXI, filed 10/11/65; § XXI, filed 2/12/65; § XI, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-270.

296-04-210 Construction limit of rules. [§ XII, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-220 Director may obtain consultants. [§ XIII, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-225 Consultants. [§ XXII, filed 10/11/65; § XXII, filed 2/12/65.] Repealed by Order 71-3, filed 3/25/71.

296-04-230 Role of consultants. [§ XIV A, filed 3/23/60.] This section has been decodified as they were omitted from "The Rules and Regulations of the Washington State Apprenticeship Council" which were filed on 2/12/65 and 10/11/65.

296-04-240 Dissemination of information by consultants limited. [§ XXIII, filed 10/11/65; § XXIII, filed 2/12/65; § XIV B, filed 3/23/60.] Repealed by Order 71-3, filed 3/25/71.

296-04-250 Signatures accepted. [§ XXIV, filed 10/11/65; § XXIV, filed 2/12/65.] Repealed by Order 71-3, filed 3/25/71. See WAC 296-04-160.

INTERNAL RULES

WAC 296-04-001 Foreword. The Washington State Apprenticeship and Training Act, RCW 49.04.010-49.04.910, establishes the Council and its administrative arm, the Apprenticeship and Training Division of the Department of Labor and Industries. The intention of the Council and Department in promulgating and adopting these rules is to establish a uniform procedure to be followed by state and local apprenticeship and training committees in presenting matters to the State Apprenticeship and Training Council and further to establish standards by which the Council can operate to effectuate its statutory obligations set forth in the apprenticeship act.

All policies and rules of the Council are designed to strengthen apprenticeship and training in the State of Washington, as well as to explain related factors established under existing state and federal laws. The Council, as the responsible legislative organ governing apprenticeship and training, requests the cooperation and assistance of all interested persons, organizations, and agencies functioning within the framework of the rules and regulations. [Order 71-3, § 296-04-001, filed 3/25/71; Forward, filed 10/11/65, filed 2/12/65, filed 3/23/60.]

WAC 296-04-005 Apprenticeship and training agreements—Proposed standards. The Washington State Apprenticeship and Training Council is the body responsible for matters concerning apprenticeship and training in the State of Washington. The principal function of the Council is to approve and register apprenticeship and training agreements. Persons or organizations desiring to institute an apprenticeship or training program must first prepare proposed standards which conform to these rules and to RCW 49.04.050. The standards must also include the composition of and general rules for the committee which will administer the program. The supervisor, or Washington State apprenticeship coordinators, are available to give assistance in this task.

These standards, which will be either a plant program or committee program as defined herein, must then be presented to the supervisor at least 30 days before the

business meeting at which the Council will be requested to consider such proposed standards. The standards proposed will then be discussed by the Council and approved, disapproved, or approved subject to enumerated changes. Minor changes may be made at the Council meeting if authorized representatives of all concerned are present and authorized to accept changes.

The committee thus set up then begins functioning. Its duties are to run the day to day operations of the apprenticeship and training program. It is charged with operating the program in accordance with the standards as approved by the Council. It is charged with accepting or rejecting applicants for apprenticeship or training, registering accepted applicants as apprentices or trainees with the Supervisor of Apprenticeship and Training, removing apprentices or trainees from the program in accordance with the standards and informing the supervisor of any matters which affect the standing of individuals as apprentices or trainees. Persons not registered with the supervisor or apprentices or trainees cannot be recognized as apprentices or trainees by the Council.

The supervisor and his staff may be consulted on any matters concerning apprenticeship and training, and they will provide any information concerning apprenticeship training which is available to them. They are also required to investigate any discrepancies between the actual and required operation of any program and conduct systematic reviews of the operation of all programs. The supervisor may recommend cancellation of any program which is not operated in accordance with its approved standards after notice of violation is given in accordance with the provisions of WAC 296-04-270(3).

Any person, firm, committee, agency, or other body, aggrieved by a decision of the supervisor or of any committee may appeal that decision to the Council in accordance with the provisions of WAC 296-04-290. [Order 71-3, § 296-04-005, filed 3/25/71.]

WAC 296-04-010 Regular meetings. The council shall hold regular (quarterly) business meetings at such locations and times within the state, that will best serve apprenticeship. Notice of meetings, when called by the chairman, shall be sent to all council members, ex officio members, approved joint apprenticeship committees, and may be sent to such other person, persons, organizations or agency whose presence is desired, thirty days prior to such meetings. [§ II, filed 10/11/65; § II, filed 2/12/65; § 1, filed 3/23/60.]

WAC 296-04-015 Definitions. Whenever in these rules and regulations, the following words shall have these meanings:

(1) "Council" shall mean the Washington State Apprenticeship and Training Council established pursuant to RCW 49.04.010.

(2) The words "apprenticeship committee" shall mean a state or local Joint Apprenticeship Committee established pursuant to RCW 49.04.040 and/or a committee administering a plant program.

(3) The words "business meeting" shall mean a public meeting of the Council as described in WAC 296-04-040(1).

(4) The term "special meeting" shall mean a public meeting of the Council as described in WAC 296-04-040(2).

(5) The word "supervisor" shall mean the Supervisor of Apprenticeship and Training appointed pursuant to RCW 49.04.030.

(6) The term "agreement" shall mean an apprenticeship agreement and/or training agreement.

(7) The term "plant program" shall mean an apprenticeship agreement defined in WAC 296-04-270(1)(b).

(8) The term "individual agreement" shall mean a written agreement between an apprentice and/or trainee and either his employer or an apprenticeship committee acting as agent for the employer.

(9) The term "committee program" shall mean an apprenticeship agreement described in WAC 296-04-270(1)(a).

(10) The term "on-the-job training program" shall mean a program described in WAC 296-04-280.

(11) The term "trainee" shall mean a person registered with the supervisor pursuant to an on-the-job training program pursuant to WAC 296-04-280.

(12) The term "apprentice" shall mean a person registered with the supervisor pursuant to an apprenticeship training program pursuant to WAC 296-04-270 for purposes of chapter 49.04 RCW and these rules.

(13) The term "standards" shall mean a written agreement setting forth a plan containing all terms and conditions for the qualifications, recruitment, selection, employment, and training of apprentices, as further defined in RCW 49.04.050. [Order 76-4, § 296-04-015, filed 2/20/76; Order 71-13, § 296-04-015, filed 10/28/71; Order 71-3, § 296-04-015, filed 3/25/71; § I, filed 10/11/65; § I, filed 2/12/65.]

WAC 296-04-040 Council meetings—When held—Notice—Who may attend—Quorum. Council meetings shall be of two kinds—business meetings and special meetings:

(1) **Business Meetings.** Business meetings of the Council shall be held at least quarterly during each year on the third Thursday and Friday of the months of January, April, July and October. Such business meetings shall be held at such locations within the State of Washington which in the opinion of the Council will best promote the purposes of the Washington State Apprenticeship and Training Act. All meetings of the Council shall be open to the general public, and all actions, transaction of official business of the Council, collective decision, commitment or promise, and all collective discussion, acquisition and exchange of facts in the course of deliberation prior to any action of the Council shall only be made in meetings open to the public consistent with the provisions of the Open Public Meetings Act of 1971 (chapter 250, Laws of 1971 1st ex. sess.) and chapter 34.04 RCW. No member of the general public will be required as a condition upon attending any Council meeting to register his name or give any other information or to fulfill any condition precedent to his

attendance at Council meetings. Notice of such meetings shall be given to all approved committees and may be given to any persons, organizations, or agencies at the direction of the Council, or any member thereof, and in addition shall be given to any newspaper, news service, television or radio station which has requested to be notified of Council meetings. Committee programs, plant programs, or amendments thereto, may be approved or disapproved only at business meetings.

(2) **Special Meetings.** Special meetings of the Council may be called by the chairman or by majority of the Council members by delivering personally or by mail, written notice to each member of the Council, and all approved joint apprenticeship and training committees, and to each newspaper of general circulation, television or radio station, which has on file with the Council or the Supervisor, a request to be notified of such special meeting of the Council which shall be ineffective unless it sets forth the date, time and location of the meeting and specifies the business to be transacted by the Council at such special meetings. Final disposition may not be made of any matter at such special meeting other than specified in the notice of such special meeting. Special meetings shall be open to the general public to the same extent at the quarterly business meetings of the Council. Notice of special meetings must be delivered personally or by mail at least twenty-four hours before the time specified in the notice of such special meeting except in the case of rule changes pursuant to Chapter 34.04 RCW which must be at least 20 days before the time specified in the notice.

(3) **Notice of Council Meetings.** Notice of each quarterly business meeting of the Council shall be given to all Council members by the Supervisor at least 20 days before the date set for the meeting and in addition shall give notice to such other persons and organizations as specified in subsection (1) of this section.

(4) **Notice of Special Meetings of the Apprenticeship Council.** Notice of special meetings of the Council may be given by the Supervisor at the request of the Chairman or the majority of the members of the Council in the manner and form specified in subsection (2) of this section. If such notices are not given, no action taken by the Council shall be effective at such meetings unless each regular Council member at such meeting, or prior thereto, gives a written waiver of notice of such meeting to be filed by the Supervisor and the notice shall be deemed to be waived by any member who is present at the meeting at the time it convenes. *Provided*, That rule change may not be made at such special meeting unless the requirements of Chapter 34.04 RCW have been complied with.

(5) **Submission of Petitions or Requests.** The Council will not act upon any petition or request which is addressed to the Council unless such a petition or request is submitted in writing, to the Supervisor at least 30 days prior to the date of such quarterly business meeting, and any petitions or requests not submitted 30 days prior to such quarterly meeting shall be deferred to the next quarterly business meeting of the Council and the petitioner shall be so notified by the supervisor.

(6) **Quorum.** Two-thirds of the Council members entitled to vote shall be considered a quorum. [Order 72-8, § 296-04-040, filed 6/8/72; Order 71-3, § 296-04-040, filed 3/25/71; § V, filed 10/11/65; § V, filed 2/12/65; § III, filed 3/23/60.]

WAC 296-04-045 Supervisor-administrator of council. The supervisor shall be the administrator of the Council. He shall perform the duties listed in RCW 49.04.030 and, in addition, he shall register all agreements conforming to WAC 296-04-270 in his office, review programs and their operation, and recommend cancellation of any committee program, or plant program previously registered which is not operated in conformity with its agreement. All documents concerning apprenticeship or training agreements, their revision or any other matters affecting apprenticeship or training shall be sent to him. Such documents may be addressed to: Supervisor of Apprenticeship and Training, Department of Labor and Industries, Olympia, Washington. [Order 71-3, § 296-04-045, filed 3/25/71.]

WAC 296-04-050 Plant program defined. For the purpose of these rules a "plant program", over which the Council will assume jurisdiction and serve as a joint apprenticeship committee, pursuant to the authority of RCW 49.04.040, means: An apprenticeship agreement or agreements with an employer which conforms in form and substance with the applicable provisions of these rules and chapter 49.04 RCW in an apprenticeable trade, craft or occupation in which a major portion of the work to be performed by the apprentice for such employer, is within a geographical area not served by an approved local or joint apprenticeship and training committee. The apprenticeship agreement must specify the number of required hours for completion of apprenticeship which must equal or exceed the average number of hours for such trade, craft or occupation within this state, which in any event shall not be less than 4,000 hours of reasonably continuous employment. [Order 72-18, § 296-04-050, filed 11/8/72.]

WAC 296-04-060 Officers, appointment, duties—Ex-officio members. The officers of the Council shall be a chairman, vice-chairman, and secretary.

(1) Chairman and vice-chairman.

(a) The chairman and vice-chairman shall be elected by majority vote of the Council members present and voting at the quarterly business meeting nearest to the month of June in each odd-numbered year. They shall hold office for a term of two years and until their successors are elected, or until their death or resignation.

(b) The chairman shall preside over all meetings, conducting them in accordance with Robert's Rules of Order as modified by these rules and regulations. He may vote in all matters before the Council as a regular member and may participate in discussion of all matters before the Council. He shall have such other powers and duties as are now or hereafter provided in these rules and regulations and as are usual or necessary to chairmen, as provided in Robert's Rules of Order.

(c) The vice-chairman shall preside over all Council meetings in the absence of the Chairman. He shall have all of the powers and duties of chairman when he is so presiding.

(2) Secretary:

(a) The supervisor shall be the secretary of the Council. He shall hold the office of secretary during his tenure as supervisor.

(b) The secretary shall, with the assistance of a recording secretary, keep minutes of all special and regular meetings. He shall keep a copy of the minutes of all regular and special meetings on file in his office as supervisor. He shall forward copies of minutes of all meetings to all regular and ex-officio members of the Council and shall make copies of the minutes of all meetings available to the public upon request. He shall have other powers and duties as are provided in these rules and regulations and as are usually or necessarily concomitant with the office of secretary.

(3) Ex-officio members of the Council shall have the full right to participate in discussion of any matters before the Council. They shall have no vote. [Order 76-4, § 296-04-060, filed 2/20/76; Order 71-3, § 296-04-060, filed 3/25/71; § VII, filed 10/11/65; § VII, filed 2/12/65; § V, filed 3/23/60.]

WAC 296-04-090 Rules of order. "Robert's Rules of Order" shall prevail at all meetings unless otherwise provided for by these rules. [§ X, filed 10/11/65; § X, filed 2/12/65; § VI, filed 3/23/60.]

WAC 296-04-105 Retroactivity. The Council may make any action or decision which it takes retroactive to the date of the previous business session. [Order 71-3, § 296-04-105, filed 3/25/71; § XII, filed 10/11/65; § XII, filed 2/12/65.]

WAC 296-04-115 Amendment. These rules and regulations may be amended by a two-thirds majority of regular Council members. All Council members, the supervisor, the committees and any other interested persons shall be promptly notified of any changes in writing. Such amendments shall be promulgated in accordance with the Administrative Procedure Act, Title 34 RCW. [Order 71-3, § 296-04-115, filed 3/25/71; § XIII, filed 10/11/65; § XIII, filed 2/12/65.]

WAC 296-04-125 Rule change-procedures and forms. The procedure and form for petitions requesting the making, amendment, or repeal of a rule are set forth in WAC 296-08-540, 296-08-550, 296-08-560, 296-08-570 and 296-08-590(2). The procedure and form for requests for declaratory rulings are set forth in WAC 296-08-580, 296-08-590(1). Such petitions and requests shall be addressed to the Washington State Apprenticeship and Training Council and mailed to the Supervisor of Apprenticeship and Training at his address hereinbefore in WAC 296-04-045 stated. [Order 71-3, § 296-04-125, filed 3/25/71.]

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WAC 296-04-160 Apprenticeship committees. Apprenticeship committees shall be appointed in accordance with the provisions of RCW 49.04.040. Such committees shall have the duties prescribed by statute, these rules and the approved standards under which they operate. The Council will not approve the creation of any state or local apprenticeship committee in an area already served by such a committee in the same trade or craft, except to consolidate committees. Committees shall function, administrate or relinquish authority only with the consent of the Council. On any petition addressed to the Council or the Supervisor, only the signature of the elected chairman and secretary of the committee shall be accepted unless the apprenticeship committee has petitioned the Council to recognize and accept the signature of another person. Such a petition must be signed by a quorum of the members of the petitioning apprenticeship committee. It is the Council's view that joint apprenticeship and training committees are not state agencies but rather only quasi-public entities performing services jointly for management and labor by assistance to the apprenticeship program. [Order 76-4, § 296-04-160, filed 2/20/76; Order 72-8, § 296-04-160, filed 6/8/72; Order 71-3, § 296-04-160, filed 3/25/71; § XVI, filed 10/11/65; § XVI, filed 2/12/65; § X A, filed 3/23/60.]

WAC 296-04-260 Merit awards. The supervisor, with the approval of the Council, may issue awards for meritorious service to persons who have given at least five years of continuous service to the apprenticeship and training program of this State. [Order 71-3, § 296-04-260, filed 3/25/71; § XXV, filed 10/11/65; § XXV, filed 2/12/65.]

WAC 296-04-270 Apprenticeship agreements—Types—Standards—Registration, review, cancellation, re-registration—Certificate of completion. (1) The following apprenticeship agreements shall be recognized pursuant to RCW 49.04.060:

(a) A written agreement between an association of employers and an organization of employees describing the conditions of training for apprentices.

(b) A written statement of an employer or a written agreement between an employer and an employee organization describing the conditions of training for apprentices.

(c) A written statement of an employer or a written agreement between an employer and an employee organization describing the conditions of training apprentices. The former agreement shall be recognized only if there is no bona fide employee organization in the plant affected by the agreement.

(d) A written agreement between an employer and an individual apprentice describing the conditions of apprenticeship.

(2) Apprenticeship agreements shall conform to the following standards:

(a) Committee programs, plant programs and on-the-job training programs must contain the provisions required by RCW 49.04.050 and, in addition, shall contain:

(i) Provision for nondiscrimination in the selection of apprentices in substantially the following form:

Each sponsor of an apprenticeship program shall include in its standards the following equal opportunity pledge: "The recruitment, selection, employment and training of apprentices during their apprenticeship shall be without discrimination because of race, color, religion, national origin, or sex. The sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required by the rules of the Washington State Apprenticeship and Training Council and Title 29, Part 30 of the Code of Federal Regulations.

(ii) Provision that there shall be no discrimination on the basis of race, color, creed, sex, or national origin after selection during all phases of employment during apprenticeship.

(iii) Provision that adequate records of the selection process must be kept for a period of at least five years and will be made available to the Council or its designated representative on request. Such records must include a brief summary of any interviews and the conclusions reached on each of the specific factors which are part of the total judgment concerning each applicant.

(iv) Provision for local committee rules and regulations consistent with these rules and the applicable apprenticeship agreement.

(b) Any proposed standards for apprenticeship must be substantially similar to any standards for apprenticeship already approved by the Council for the industry, craft or trade in question to the end that there is general statewide uniformity of such standards in each industry, trade or craft.

(c) A sample apprenticeship agreement which the Council approves is available on request from the supervisor.

(3) Registration, Review, Cancellation, Re-Registration.

(a) All individual agreements shall be registered with the supervisor and subject to his approval.

(b) The supervisor and his staff, in the performance of their field work, shall conduct a systematic review of all plant and committee programs and shall take appropriate action, including recommendation of cancellation, when they find that any program is not being operated according to these rules and regulations or according to its applicable standards.

(c) When any program is found to be operating in a manner inconsistent with or contrary to these rules and regulations or its established plant or committee program, the supervisor shall notify the offending committee, person, firm or agency of the violation. If the supervisor does not receive notice, within 60 days, of action taken to correct such violations, the supervisor may take whatever action he deems necessary, including recommendation of cancellation of the apprenticeship or training program and agreement to the Council.

(d) If the supervisor deems it necessary to recommend cancellation of an apprenticeship or training program, he shall do so in writing to each Council member, stating in detail the reasons for his recommendation. A copy of

said recommendation shall be mailed to the last known address of each member of the committee administering said program, or to those persons responsible for said program, together with notice that the Council shall consider the recommendation at its next regularly scheduled meeting more than 30 days subsequent to the date of the recommendation and that all interested persons may present evidence or testimony regarding said recommendation. The Council shall decide the question before it upon majority vote of the members present and voting and shall notify all interested parties of its decision together with the reasons for it, in writing.

(e) The cancellation of any program or agreement shall automatically effect a cancellation of any agreement registered thereunder, provided that any organization or firm not responsible for the violations causing the cancellation may petition the Council for approval of such cancelled agreement or program as a new program.

(f) Certificates of completion shall be issued at the request of the appropriate committee. An affidavit of the secretary of the committee concerned shall accompany the request, which affidavit shall state that the apprentice has successfully completed the apprenticeship program of that committee, and that he has been an active, registered participant of that committee's program for at least six months. [Order 76-4, § 296-04-270, filed 2/20/76; Order 71-3, § 296-04-270, filed 3/25/71; § XXVI, filed 10/11/65; § XXVI, filed 2/12/65.]

WAC 296-04-280 On-the-job-training programs.

(1) Training programs may be set up in the same manner as apprenticeship programs, with any exceptions authorized by the Council provided that no on-the-job training program shall be established or authorized where there is a parallel apprenticeship program in existence. A training program shall be any program which requires 4,000 or less hours of employment for completion. All of these rules shall apply to them as to apprenticeship agreements and programs, except that they will be approved by the supervisor subject to the review of the Council.

(2) A pattern standard for a trainee program is available from the supervisor on request. [Order 76-4, § 296-04-280, filed 2/20/76; Order 71-3, § 296-04-280, filed 3/25/71.]

WAC 296-04-290 Appeal procedure. Local and state apprenticeship committees shall conduct their affairs consistent with the standards and accompanying foreword section as approved by the Council and the following procedures:

(1) Any person, firm, committee or agency feeling aggrieved by any final action taken or decision made by a local or state apprenticeship committee (relating to any subject matter under chapter 49.04 RCW) may appeal same to the Council after exhausting a reconsideration procedure before such local or state committee.

(2) Requests for reconsideration to any local or state committee regarding their acts or decisions shall be made within 30 days following said act or decision. Such request shall not suspend such act or decision pending

the re-examination by such committee. Final determinations by the committee shall be in writing and transmitted to all parties either directly or by mail following reconsideration.

(3) Appeals to the Council must be submitted to the Council Secretary in writing within 30 days after the final committee decision is transmitted by the local or state committee to the appealing party. Copies of said appeal notice shall also be forwarded to the committee and any other party to the proceeding. Requests for appeal to the Council shall not suspend such action or decision pending a determination of the appeal by the Council unless by express order of the Council for good cause shown.

(4) The Council, at the request of the appealing party, may conduct either a formal or informal hearing (if applicant so requests the Council may approve a closed hearing) in accordance with chapter 34.04 RCW, and may dispose of such matter by stipulation, agreed settlement, consent order, or default. The Council may approve and conduct an informal hearing upon a written agreement of the appealing party and committee. Appeal hearings will be held in conjunction with regular quarterly meetings unless the appealed act or decision is one that in the judgment of the Council requires special processing, in which event the Council will take action to expedite a determination as soon as practicable. Intervenor may be admitted into the proceedings by timely application to the Council so long as this admittance would not unduly delay the proceedings.

(5) All parties and their attorneys of record, if any, will receive a copy of the Council's decision in the form of findings, conclusions and order. Such order, consistent with all applicable state law, shall be subject to judicial review pursuant to the Administrative Procedures Act of the State of Washington, chapter 34.04 RCW.

(6) These appeal procedures are intended to be supplemental to any other legal procedures and appeal rights that may be applicable under law or collective bargaining provisions to any individual, firm, committee or agency. [Order 76-4, § 296-04-290, filed 2/20/76; Order 72-18, § 296-04-290, filed 11/8/72; Order 71-3, § 296-04-290, filed 3/25/71.]

AFFIRMATIVE ACTION PLAN

WAC 296-04-300 Promulgation. WAC 296-04-300 through 296-04-480 of this chapter sets forth the affirmative action plan of the Washington State Apprenticeship and Training Council and establishes the policies and procedures to promote equality of opportunity in apprenticeship programs approved by the Washington State Apprenticeship and Training Council and are adopted in accordance with the provisions of Title 29, Part 30 of the Code of Federal Regulations as amended and promulgated by the United States Department of Labor. These policies and procedures apply to the recruitment and selection of apprentices, and to all conditions of employment and training during apprenticeship; and the procedures established provide for review of apprenticeship programs, for processing

complaints, and for deregistering noncomplying apprenticeship programs. These policies and procedures also provide for continued or withdrawal of recognition of apprenticeship programs. The purpose of the following sections are to promote equality of opportunity in apprenticeship by prohibiting discrimination based on race, color, religion, national origin, or sex in apprenticeship programs, by requiring affirmative action to provide equal opportunity in such apprenticeship programs, and by coordinating these policies and procedures with other equal opportunity programs. All sections of WAC 296-04-300 through 296-04-480 of this chapter addressing affirmative action for minorities shall also apply to women, except for WAC 296-04-340(4)(e). [Order 77-3, § 296-04-300, filed 1/25/77; Order 71-13, § 296-04-300, filed 10/28/71.]

WAC 296-04-310 Authority. The authority for the implementation and adoption of these rules and policies and procedures hereinafter set forth affecting the approval and registration of an apprenticeship program is vested in the Washington State Apprenticeship Council in accordance with the provisions of RCW 49.04.010 through 49.04.910. [Order 71-13, § 296-04-310, filed 10/28/71.]

WAC 296-04-320 Definitions. For the purpose of the interpretation of WAC 296-04-300 through WAC 296-04-480, the following terms shall have the following meanings:

(1) "Council" shall mean the Washington State Apprenticeship and Training Council established pursuant to RCW 49.04.010.

(2) "Department" shall mean the United States Department of Labor.

(3) "Supervisor" shall mean the Supervisor of Apprenticeship and Training appointed pursuant to RCW 49.04.030.

(4) "Employer" means any person or organization employing an apprentice whether or not the apprentice is enrolled with such person or organization or with some other person or organization.

(5) "Apprenticeship Program" means a program registered and approved by the Washington State Apprenticeship Council as meeting the standards of the Council for apprenticeship.

(6) "Sponsor" means any person or organization operating an apprenticeship program irrespective of whether such person or organization is an employer. [Order 71-13, § 296-04-320, filed 10/28/71.]

WAC 296-04-330 Equal opportunity standards. Obligations of Sponsors. Each sponsor of an apprenticeship program shall:

(1) Recruit, select, employ and train apprentices during their apprenticeship, without discrimination because of race, color, religion, national origin, or sex; and

(2) Uniformly apply rules and regulations concerning apprentices, including but not limited to, equality of wages, periodic advancement, promotion, assignment of

work, job performance, rotation among all work processes of the trade, imposition of penalties or other disciplinary action, and all other aspects of the apprenticeship program administered by the program sponsors; and

(3) Take affirmative action to provide equal opportunity in apprenticeship, including adoption of an affirmative action plan as required by the provisions of WAC 296-04-340.

(4) **Equal Opportunity Pledge.** Each sponsor of an apprenticeship program shall include in its standards the following equal opportunity pledge: "The recruitment, selection, employment, and training of apprentices during their apprenticeship shall be without discrimination because of race, color, religion, national origin, or sex. The sponsor will take affirmative action to provide equal opportunity in apprenticeship and will operate the apprenticeship program as required by the rules of the Washington State Apprenticeship Council and Title 29, Part 30 of the Code of Federal Regulations."

(5) **Programs Presently Registered.** Each sponsor of the program registered with the Council as of the effective date of these rules shall within six months following that effective date take the following action:

(a) Include in the standards of its apprenticeship program the equal opportunity pledge prescribed by subsection (4) of this section; and

(b) Adopt an affirmative action plan as required by WAC 296-04-340; and

(c) Adopt a selection procedure as required by WAC 296-04-350. A sponsor adopting a selection method under WAC 296-04-350(2), (3) or (4) shall prepare and have available for submission upon request, copies of its amended standards, affirmative action plans, and selection procedure. A sponsor adopting a selection method under WAC 296-04-350(5) shall submit to the Council copies of its standards, affirmative action plan, and selection procedure in accordance with the requirements of WAC 296-04-350(5)(a).

(6) **Sponsors Seeking New Registration.** A sponsor of a program seeking new registration and approval of the Council shall submit copies of its proposed standards, affirmative action plan, selection procedures, and such other information as may be required. The program shall be registered and approved and such standards, affirmative action plan, and selection procedure meet the requirements of these rules.

(7) **Programs Subject to Approved Equal Employment Opportunity Plans.** A sponsor shall not be required to adopt an affirmative action plan under WAC 296-04-340, for a selection procedure under WAC 296-04-350, if it submits to the Council satisfactory evidence that it is subject to an equal employment opportunity program providing for the selection of apprentices and for affirmative action in apprenticeship which has been approved as meeting the requirements of Title VII of the Civil Rights Act of 1964 (42 U.S.C. 2000 e, et seq.) or Executive Order 11246, as amended (30 F.R. 12319, 32 F.R. 14303, 34 F.R. 12986) and the implementing regulations published in Title 29 of the Code of Federal Regulations, Chapter XIV, and Title 41 of the Code of Federal Regulations, chapter 60.

(8) **Program with Fewer than Five Apprentices.** A sponsor of a program in which fewer than five apprentices are indentured shall not be required to adopt an affirmative action plan under WAC 296-04-340, or a selection procedure under WAC 296-04-350. [Order 71-13, § 296-04-330, filed 10/28/71.]

WAC 296-04-340 Affirmative action plans. (1) Adoption of a sponsor's commitment to equal opportunity in recruitment, selection, employment, and training of apprentices shall include the adoption of a written affirmative action plan.

(2) **Definition of Affirmative Action.** Affirmative action is not mere passive nondiscrimination. It includes procedures, methods and programs for the identification, positive recruitment, training, and motivation of present and potential minority group apprentices. It is action which will equalize opportunity in apprenticeship so as to allow full utilization of minority group manpower potential. The overall result to be sought is equal opportunity in apprenticeship for all individuals participating in or seeking entrance to the labor force of this state.

(3) **Outreach and Positive Recruitment.** An acceptable affirmative action plan must also include adequate provisions for outreach and positive recruitment that would reasonably be expected to increase minority participation in apprenticeship by expanding the opportunity of minority persons to become eligible for apprenticeship selection. In order to achieve these objectives, sponsors shall undertake activities such as those listed below. It is not contemplated that each sponsor necessarily will include all of the listed activities in its affirmative action program. The scope of the affirmative action program will depend on all the circumstances including the size and type of the program and its resources. However, the sponsor will be required to undertake a significant number of appropriate activities in order to enable it to meet its obligations under these rules. The affirmative action plan shall set forth the specific steps the sponsor intends to take in the areas listed below. Whenever special circumstances warrant, the Council may provide from any funds made available to it for such purpose, such financial or other assistance it deems necessary to implement the requirements of this paragraph.

(a) **Dissemination of information concerning the nature of apprenticeship, availability of apprenticeship opportunities, sources of apprenticeship applications, and equal opportunity policy of the sponsor.** For programs accepting applications only at specified intervals, such information shall be disseminated at least 30 days in advance of the earliest date for application at each interval. For programs customarily receiving applications throughout the year, such information shall be regularly disseminated, but not less than semiannually. Such information shall be given to the Council, local schools, employment service offices, community organizations which can effectively reach minority groups, and published in newspapers which are circulated in the minority community as well as the general areas in which the program sponsor operates.

(b) Participate in any workshops conducted by employment service agencies for the purpose of familiarizing school, employment service and other appropriate personnel with the apprenticeship system and current opportunities therein.

(c) Cooperation with the local school boards and vocational education systems to develop programs for preparing students to meet the standards and criteria required to qualify for entry into apprenticeship programs.

(d) Internal communication of the sponsor's equal opportunity policy in such a manner as to foster understanding, acceptance, and support among the sponsor's various officers, supervisors, employees, and members and to encourage such persons to take the necessary action to aid the sponsor in meeting its obligations under these rules.

(e) Engaging in such programs as outreach for the positive recruitment and preparation of potential applicants for apprenticeship; where appropriate and feasible, such programs shall provide for pretesting experience and training. If no programs are in existence, the sponsor shall seek to initiate these programs, or, when available, to obtain financial assistance from the Council. In initiating and conducting these programs, the sponsor may be required to work with other sponsors and appropriate community organizations.

(f) To encourage the establishment and utilization of programs of preapprenticeship, preparatory trade training, or others designed to afford related work experience or to prepare candidates for apprenticeship, a sponsor shall make appropriate provision in its affirmative action plan to assure that those who complete such programs are afforded full and equal opportunity for admission into the apprenticeship program.

(g) Utilization of journeymen to assist in the implementation of the sponsor's affirmative action program.

(h) Granting advance standing or credit on the basis of previously acquired experience, training, skills, or aptitude for all applicants equally.

(i) Admitting to apprenticeship persons whose age exceeds the maximum age for admission to the program, where such action is necessary to assist the sponsor in achieving its affirmative action obligations.

(j) Such other action as to assure that the recruitment, selection, employment, and training of apprentices during apprenticeship, shall be without discrimination because of race, color, religion, national origin, or sex; such as: General publication of apprenticeship opportunities and advantages in advertisements, industry reports, articles, etc.; use of present minority apprentices and journeymen as recruiters; career counseling; periodic auditing of affirmative action programs and activities; and development of reasonable procedures between the sponsor and the employers of apprentices to insure that equal employment opportunity is being granted including reporting systems, on site reviews, briefing sessions, etc. The affirmative action programs shall set forth the specific steps the program under this subsection (3) sponsors intend to take in the above areas. Whenever special circumstances warrant, the Council may provide such financial or other assistance from funds available to

it for that purpose, as it deems necessary to implement the above requirements.

(4) Goals and Timetables. (a) A sponsor adopting a selection method under WAC 296-04-350, (2) or (3) which determines on the basis of analysis described in subdivision (e) and (f) as applicable of this subsection that it has deficiencies in terms of the underutilization of minorities and women in the craft or crafts represented by the program shall include in its affirmative action plan percentage goals and timetables for the admission of minority and female applicants into the eligibility pool.

(b) A sponsor adopting a selection method under WAC 296-04-350, (4) or (5), which determines on the basis of the analysis described in subdivision (e) and (f) as applicable of this subsection, that it has deficiencies in terms of the underutilization of the minorities and women in the craft or crafts represented by the program shall include in its affirmative action plan percentage goals and timetables for the selection of minority and female applicants for the apprenticeship program.

(c) "Underutilization" as used in this subsection refers to the situation where there are fewer minorities and women in the particular craft or crafts represented by the program than would reasonably be expected in view of an analysis of the specific factors in subdivision (e) and (f) as applicable, of this subsection, below. Where, on the basis of the analysis, the sponsor determines that it has no deficiencies, no goals and timetables need be established. However, where no goals and timetables are established, the affirmative action plan shall include a detailed explanation why no goals and timetables have been established.

(d) Where the sponsor fails to submit goals and timetables as part of its affirmative action plan or submits goals or timetables which are unacceptable, and the Council determines that the sponsor has deficiencies in terms of underutilization of minorities and women within the meaning of this section, the Council shall establish goals and timetables applicable to the sponsor for the admission of minority and female applicants into the eligibility pool or selection of apprentices, as appropriate. The sponsor shall make good faith efforts to obtain these goals and timetables in accordance with the requirements of this section.

(e) Analysis to Determine if Deficiencies Exist For Minorities. The sponsor's determination as to whether goals and timetables shall be established for minorities shall be based on an analysis of at least the following factors, which analysis shall be set forth in writing as part of the affirmative action plan.

(i) The minority population of the labor market in which the program sponsor operates;

(ii) The size of the minority labor force in the program sponsor's labor market area;

(iii) The percentage of the minority participation as apprentices in the craft as compared with the percentage of minorities in the labor force in the program sponsor's labor market area;

(iv) The percentage of minority participation as journeymen employed by the employer or employers participating in the program as compared with the percentage of

minorities in the sponsor's labor market area and the extent to which the sponsor should be expected to correct any deficiencies through the achievement of goals and timetables for the selection of apprentices;

(v) The general availability of minorities with present or potential capacity for apprenticeship in the program sponsor's labor market area.

(f) Analysis to Determine if Deficiencies Exist [Exist] for Women. The sponsor's determination as to whether goals and timetables shall be established for women, shall be based on an analysis of at least the following factors, which analysis shall be set forth in writing as part of the affirmative action plan.

(i) The size of the female unemployment force in the labor market in which the program sponsor operates;

(ii) The percentage of the female workforce as compared with the total workforce in the program sponsor's labor market area;

(iii) The availability of women meeting the program entrance requirements in the program sponsor's labor market area;

(iv) The percentage of female participation as journeymen employed by the employer or employers participating in the program as compared by the percentage of women in the workforce in the sponsor's labor market area;

(v) The general availability of women with interest and present or potential capacity for apprenticeship in the program sponsor's labor market area.

(g) Establishment and Attainment of Goals and Timetables. The goals and timetables shall be established on the basis of the sponsor's analysis of its underutilization of minorities and its entire affirmative action program. In establishing the goals, the sponsor should consider the results which could be reasonably expected from its good faith efforts to make its overall affirmative action program work. Compliance with these requirements shall be determined by whether the sponsor has met its goals within its timetable, or failing that, whether it has made good faith efforts to meet its goals and timetables. Its "good faith efforts" shall be judged by whether it is following its affirmative action program and attempting to make it work, including evaluation and changes in its program were necessary to attain the maximum effectiveness toward the attainment of its goals.

(h) Data and Information. The supervisor shall make available to program sponsors data and information on minority population and labor force characteristics for each Standard Metropolitan Statistical Area, and for other special areas as appropriate. [Order 77-3, § 296-04-340, filed 1/25/77; Order 71-13, § 296-04-340, filed 10/28/71.]

WAC 296-04-350 Selection of apprentices. (1) Obligations of Sponsors. In addition to development of a written affirmative action plan to insure that minorities have an equal opportunity for selection as apprentices and otherwise insure the prompt achievement of full and equal opportunity in apprenticeship, each sponsor shall further provide in its affirmative action program that the selection of apprentices shall be made under one of the

methods specified in the following subsections (2) through (5) of this section.

(2) **Selection Methods.** The sponsor shall adopt one of the following methods of selecting apprentices:

(a) Selection on Basis of Rank from Pool of Eligible Applicants. A sponsor may select apprentices from a pool of eligible applicants created in accordance with the requirements of subdivision (c) of this subsection on the basis of the rank order of scores of applicants on one or more qualification standards where there is a significant statistical and practical relationship between rank order of scores and performance in the apprenticeship program. In demonstrating such relationship, the sponsor shall follow the procedure set forth in the Department of Labor order of September 9, 1968 (33 F.R. 14392, Sept. 24, 1968), covering the validation of employment tests of contractors and subcontractors subject to the provisions of Executive Order 11246, as amended.

(b) Requirements. The sponsor adopting this method of selecting apprentices shall meet the requirements of subdivisions (c) through (g) of this subsection.

(c) Creation of Pool of Eligibles. A pool of eligibles shall be created from applicants who meet the qualifications of minimum legal working age and the sponsor's minimum physical requirements; or from applicants who meet qualification standards in addition to minimum legal working age and the sponsor's minimum physical requirements: *Provided*, That any additional qualification standards conform with the following requirements:

(i) Qualification Standards. The qualification standards and the procedures for determining such qualification standards shall be stated in detail and shall provide criteria for the specific factors and attributes to be considered in evaluation of applicants for admission to the pool. The score required under each qualification standard for admission to the pool shall also be specified. All qualification standards, and the score required on any standard for admission to the pool, shall be directly related to job performance, as shown by a significant statistical and practical relationship between the score on the standards, and the score required for admission to the pool, and performance in the apprenticeship program. In demonstrating such relationships, the sponsor shall follow the procedures set forth in the United States Department of Labor's testing order of September 9, 1968. Qualifications shall be considered as separately required so that the failure of an applicant to obtain the specified score under a single qualification standard shall disqualify the applicant from admission to the pool.

(ii) Aptitude Tests. Any qualification standard for admission to the pool consisting of aptitude test scores shall be directly related to job performance, as shown by significant statistical and practical relationships between the score on the aptitude test, and the score required for admission to the pool, and performance in the apprenticeship program. In determining such relationships, the sponsor shall follow the procedures set forth in the United States Department of Labor's testing order of September 9, 1968. The requirements of this item (ii) shall also be applicable to aptitude tests utilized by a program sponsor which are administered by a state employment service agency, a private employment agency,

or any other person, agency or organization engaged in the selection or evaluation of personnel. A national test developed and administered by a national joint apprenticeship committee will not be approved by the United States Department of Labor unless such test meets the requirements of this subdivision.

(iii) Educational Attainments. All educational attainments or achievements as qualifications for admission to the pool shall be directly related to job performance, as shown by a significant statistical and practical relationship between the score, and the score required for admission to the pool, and performance in the apprenticeship program. In demonstrating such relationships the sponsor shall meet the requirements of the United States Department of Labor's testing order of September 9, 1968. School records or the results of general educational development tests recognized by the State or local public instruction authority shall be evidence of educational achievement. Education requirements shall be applied uniformly to all applicants.

(d) Oral Interviews. Oral interviews shall not be used as a qualification standard for admission into an eligibility pool. However, once an applicant is placed in the eligibility pool, and before he is selected for apprenticeship from the pool, he may be required to submit to an oral interview. Oral interviews shall be limited to only such objective questions as may be required to determine the fitness of applicants to enter the apprenticeship program, which shall not include questions relating to qualifications previously determined in gaining entrance to the eligibility pool. When an oral interview is used, each interviewer shall record his questions, the general nature of answers, and shall prepare a summary of any conclusions. Applicants rejected from the pool of eligibles on the basis of an oral interview shall be given a written statement of such rejection, the reasons therefor, and the appeal rights available to the applicant.

(e) Notification of Applicants. All applicants who meet the requirements for admission shall be notified and placed in the eligibility pool. The program sponsors shall give each rejected applicant notice of his rejection, including the reason for his rejection, the requirements for admission to the pool of the eligibles, and the appeal rights available to the applicant.

(f) Goals and Timetables. The sponsor shall establish, where required by WAC 296-04-340(4), percentage goals and timetables for the admission of minority persons into the pool of eligibles in accordance with the provisions of WAC 296-04-340(4), (a) through (f).

(g) Compliance. A sponsor shall be deemed to be in compliance with its commitments under subdivision (f) of this subsection (2) if it meets its goals or timetables or if it makes a good faith effort to meet these goals and timetables. In the event of the failure of the sponsor to meet his goals and timetables, it shall be given an opportunity to demonstrate that it has made every "good faith effort" to meet its commitments (see WAC 296-04-430(4)(f)). All the actions for the sponsor shall be reviewed and evaluated in determining whether such good faith efforts have been made.

(3) Random Selection from Pool of Eligible Applicants.

(a) Selection. A sponsor may select apprentices from a pool of eligible applicants on a random basis. The method of random selection is subject to approval by the Council. Supervision of the random selection process shall be any impartial person or persons selected by the sponsor, but not associated with the administration of the apprenticeship program. The time and place of the selection, and the number of apprentices to be selected, shall be announced. The place of the selection shall be open to all applicants and the public. The names of apprentices drawn by this method shall be posted immediately following the selection at the program sponsor's place of business.

(b) The sponsor adopting this method of selecting apprentices shall meet the requirements of subdivisions (c) through (e) of subsection (3) of this section relating to the creation of a pool of eligibles, oral interviews and notification of applicants.

(c) Goals and Timetables. The sponsor shall establish where required by WAC 296-04-340(4), percentage goals and timetables for the admission of minority persons into the pool of eligibles in accordance with the provisions of WAC 296-04-340(4), (d) through (f).

(d) Compliance. Determinations as to the sponsor's compliance with its obligations under these rules shall be in accordance with the provisions of subdivision (g) of subsection (2) of this section.

(4) Selection from Pool of Current Employees.

(a) Selection. A sponsor may select apprentices from an eligibility pool of the workers already employed by the program sponsor in a manner prescribed by a collective bargaining agreement where such exists, or by the sponsor's established promotion policy. The sponsor adopting this method of selecting apprentices shall establish goals and timetables for the selection of minority apprentices, unless the sponsor concludes, in accordance with the provisions of WAC 296-04-340(4), (d) through (f), that it does not have deficiencies in terms of underutilization of minorities in the apprenticeship of journeymen crafts represented by the program.

(b) Compliance. The determination as to the sponsor's compliance with its obligations under these regulations shall be in accordance with the provisions of subdivision (g) of subsection (2) of this section.

(5) Alternative Selection Methods. Selection. The sponsor may select apprentices by means of any other method, including its present selection method: *Provided*, That the sponsor meets the following requirements:

(a) Selection Method and Goals and Timetables. Within six months of the effective date of these rules, the sponsor shall submit to the Council, through its Supervisor, a detailed statement of the selection method it proposed to use along with the rest of its written affirmative action program including, where required by WAC 296-04-340(4), its percentage goals and timetables for the selection of minority applicants for apprenticeship and its written analysis, upon which such goals and timetables, or lack thereof, are based. The establishment of goals and timetables shall be in accordance with the provisions of WAC 296-04-340(4), (d) through (f). The sponsor may not implement any such method as

meeting the requirements of subdivision (b) of this subsection (5) and has approved the remainder of its affirmative action program including its goals and timetables. If the Council fails to act upon the selection method and the affirmative action program within 30 days of its submission, the sponsor may implement the selection method until acted upon by the Council.

(b) **Qualification Standards.** Apprentices shall be selected on the basis of objective and specific qualification standards. Examples of such standards as to fair aptitude tests, school diplomas, age requirements, occupationally essential physical requirements, fair interviews, school grades, and previous work experience. Where interviews are used, adequate records shall be kept including a brief summary of each interview and the conclusions on each of the specific factors, e.g., motivation, ambition, and willingness to accept direction which are part of the total judgment.

(6) **Compliance.** Determination as to the sponsor's compliance with its obligations under these regulations shall be in accordance with the provisions of subdivision (g) of subsection (2) of this section. Where a sponsor, despite its good faith efforts, fails to meet its goals and timetables within a reasonable period of time, the sponsor may be required to make appropriate changes in its affirmative action program to the extent necessary to obtain maximum effectiveness toward the attainment of its goals. The sponsor may also be required to develop and adopt an alternative selection method, including a method prescribed by the Council where it is determined that the failure of the sponsor to meet its goals is attributable in substantial part to the selection method. Where the sponsor's failure to meet its goals is attributable in substantial part to its use of the qualification standard which has adversely affected the opportunities of minority persons for apprenticeship, the sponsor may be required to demonstrate that such qualification standard is directly related to job performance, in accordance with the provisions of subsection (2), subdivision (c), item (i), of this section. [Order 71-13, § 296-04-350, filed 10/28/71.]

WAC 296-04-351 Employer's responsibility. In affirmative action programs under WAC 296-04-350(5) alternate selection methods where the employer does the selecting, the employer shall sign an agreement assuming responsibility for adherence to the Council's affirmative action plan contained in these regulations and 29 CFR Part 30. [Order 76-4, § 296-04-351, filed 2/20/76.]

WAC 296-04-360 Existing lists of eligibles and public notice. A sponsor adopting a selection method under WAC 296-04-350, subsections (2) or (3), and a sponsor adopting a selection method under WAC 296-04-350, subsection (5), who determines that there are few minorities on its existing list of eligibles than would be reasonably expected in view of the analysis described in WAC 296-04-340, subsection (4), subdivision (e), shall discard all existing eligibility lists upon adoption of the selection methods required by these rules. New eligibility pools shall be established and lists of eligibility

pools shall be posted at the sponsor's place of business. Sponsor shall establish a reasonable period of not less than two weeks for accepting applications for admission to the apprenticeship program. There shall be at least 30 days of public notice in advance of the earliest date for application for admission to the apprenticeship program. Applicants who have been placed in a pool of eligibles shall be retained on lists of eligibles subject to selection for a period of two years. Applicants may be removed from the list at an early date by their request or following their failure to respond to apprentice job opportunity given by registered return receipt mail notice. Applicants who have been accepted in the program shall be afforded a reasonable period of time in light of the customs and practices of the industry for reporting for work. All applicants shall be treated equally in determining such period of time. It shall be the responsibility of the applicant to keep the sponsor informed of his current mailing address. A sponsor may restore to the list of eligibles an applicant who has been removed from the list at his request or who failed to respond to an apprenticeship job opportunity. [Order 71-13, § 296-04-360, filed 10/28/71.]

WAC 296-04-370 Records. Obligations of Sponsors. (1) Each sponsor shall keep adequate records including a summary of the qualifications of each applicant, the basis for evaluation and for selection or rejection of each applicant, the records pertaining to the interviews of applicants, the original application for each applicant, information relative to the operation of the apprenticeship program, including but not limited to job assignment, promotion, demotion, layoff, or termination, rates of pay, or other forms of compensation or conditions of work, and any other records pertinent to the determination of compliance with these regulations as may be required by the Council. The records pertaining to the individual applicants, whether selected or rejected, shall be maintained in such manner as to permit identification of minority participants.

(2) **Affirmative Action Plans.** Each sponsor must retain a statement of its affirmative action plan required by WAC 296-04-340 for the prompt achievement of full and equal opportunity in apprenticeship, including all data and analysis made pursuant to the requirements of WAC 296-04-340. Sponsors shall periodically review their affirmative action plan and update it where necessary.

(3) **Qualification Standards.** Each sponsor must maintain evidence that its qualification standards have been validated in accordance with the requirements set forth in WAC 296-04-350, subsection (2).

(4) **Records of State Apprenticeship Council.** The records of the Council shall be kept in the offices of the supervisor which records shall include registration requirements, individual program standards, registration records, program compliance reviews and investigations, and any other records pertinent to the determination of compliance with these rules, as may be required by the United States Department of Labor, and shall report to the Department as may be required.

(5) **Maintenance of Records.** The records required by these rules (WAC 296-04-300 through 296-04-480) and any other information relevant to compliance with Part 30 of Title 29 of the Code of Federal Regulations shall be maintained for five years and made available upon request to the United States Department of Labor or other authorized representative. [Order 71-13, § 296-04-370, filed 10/28/71.]

WAC 296-04-380 Compliance reviews. (1) **Conduct of Compliance Reviews.** The supervisor shall regularly conduct systematic reviews of the apprenticeship programs in order to determine the extent to which sponsors are complying with these rules and will also conduct compliance reviews when circumstances, including a receipt of complaints not referred to a private review body, pursuant to WAC 296-04-400, subsection (2), subdivision (a), so warrant, and take appropriate action regarding programs which are not in compliance with the requirements of these rules. Compliance reviews will consist of comprehensive analysis and evaluations of each aspect of the apprenticeship program, including on-site investigations and audits.

(2) **Reregistration.** Sponsors seeking reregistration shall be subject to a compliance review as described in subsection (1) of this section by the supervisor as part of the reregistration process.

(3) **New Registrations.** Sponsors seeking new registrations shall be subject to a compliance review as described in subsection (1) of this section by the supervisor as part of the registration process.

(4) **Voluntary Compliance.** Where the compliance review indicates that the sponsor is not operating in accordance with these rules, the supervisor shall notify the sponsor in writing of the results of the review and make a reasonable effort to secure voluntary compliance on the part of the program sponsor within a reasonable time before undertaking sanctions under WAC 296-04-420. In the case of sponsors seeking new registrations, the supervisor will provide appropriate recommendations to the sponsor to enable it to achieve compliance for registration purposes. [Order 71-13, § 296-04-380, filed 10/28/71.]

WAC 296-04-390 Noncompliance with federal and state equal opportunity requirements. A pattern or practice of noncompliance by a sponsor (or where the sponsor is a joint apprenticeship committee, by one of the parties represented on each committee) with Federal or State laws or regulations requiring equal opportunity may be grounds for the imposition of sanctions in accordance with WAC 296-04-420, if such noncompliance is related to the equal employment opportunity of apprentices and/or graduates of such an apprenticeship program under these rules. The sponsor shall take affirmative steps to assist and cooperate with employers and unions in fulfilling their equal employment opportunity obligations. [Order 71-13, § 296-04-390, filed 10/28/71.]

WAC 296-04-400 Complaint procedure. (1) **Filing.**

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(a) Any apprentice or applicant for apprenticeship who believes that he has been discriminated against on the basis of race, color, religion, national origin, or sex with regard to apprenticeship or that the equal opportunity standards with respect to his selection have not been followed in the operation of an apprenticeship program may, by himself or by an authorized representative, file a complaint with the Council, or with a private review body established pursuant to subdivision (c) of this subsection (1). The complaint shall be in writing and shall be signed by the complainant. It must include the name, address, and telephone number of the person allegedly discriminated against, the program sponsor involved, and a brief description of the circumstances of the failure to apply the equal opportunity standards provided for in these rules.

(b) The complaint must be filed not later than 90 days from the date of the alleged discrimination of specified failure to follow the equal opportunity standards; and, in the case of complaints filed directly with review bodies designated by program sponsors to review such complaints, any referral of such complaint by the complainant to the Council must occur within the time limitation stated above or 30 days from the final decision of such review body, whichever is later. The time may be extended by the Council for good cause shown.

(c) Sponsors are encouraged to establish fair, speedy, and effective procedures for a review body to consider complaints of failure to follow the equal opportunity standards. A private review body established by the program sponsor for that purpose should number three or more responsible persons from the community serving in the capacity without compensation. Members of the review body should not be directly associated with the administration of an apprenticeship program. Sponsors may join together in establishing a review body to serve the needs of programs within the community.

(2) Processing of Complaints.

(a) When the sponsor has designated a review body for reviewing complaints, and if the Council determines that such review body will effectively enforce the equal opportunity standards, the supervisor, upon receiving a complaint, shall refer the complaint to the review body.

(b) The supervisor shall, within 30 days following the referral of the complaint to the review body, obtain the reports from the complainant and the review body as to the disposition of the complaint. If the complaint has been satisfactorily adjusted and there is no other indication of failure to apply equal opportunity standards, the case shall be closed and the parties appropriately informed.

(c) When a complaint has not been resolved by the review body within 90 days or where, despite satisfactory resolution of the particular complaint by the review body, there is evidence that equal opportunity practices of the apprenticeship program are not in accordance with these rules the Council may conduct such compliance review as found necessary, and will take all necessary steps to resolve the complaint.

(3) Where no review body exists, the Council may conduct such compliance review as found necessary in order to determine the facts of the complaint, and obtain

such other information relating to compliance with these regulations as the circumstances warrant. [Order 71-13, § 296-04-400, filed 10/28/71.]

WAC 296-04-410 Adjustments in schedule for compliance. If in the judgment of the Council, a particular situation warrants and requires special processing, and either expedited or extended determination, it shall take the steps necessary to permit such determination, if it finds that no person or party affected by such determination will be prejudiced by such special processing. [Order 71-13, § 296-04-410, filed 10/28/71.]

WAC 296-04-420 Sanctions. (1) Where the supervisor, as a result of a compliance review or other reason, determines that there is reasonable cause to believe that an apprenticeship program is not operating in accordance with these rules and voluntary corrective action has not been taken by the program sponsor, the Council shall institute proceedings to deregister the program.

(2) The deregistration proceedings shall be conducted according to the following procedures:

(a) The Council shall notify the sponsor, in writing, that a determination of reasonable cause has been made under subsection (1) of this section and that the apprenticeship program may be deregistered unless, within 15 days of the receipt of the notice, the sponsor requests a hearing. The notification shall specify the facts on which the determination is based.

(b) If within 15 days of the receipt of the notice provided for in subdivision (a) of this subsection (2), the sponsor mails a request for hearing, the supervisor shall convene an appropriate hearing.

(c) The Council shall make a final decision on the basis of the record before it, which shall consist of the compliance review file and other evidence presented. In its discretion, the Council may allow the sponsor a reasonable time to achieve voluntary corrective action. If the Council's decision is that the apprenticeship program is not operating in accordance with these rules, the apprenticeship program may be deregistered. In each case in which deregistration is ordered, the Council shall make public notice of the order and shall notify the sponsor and the complainant, if any. [Order 76-4, § 296-04-420, filed 2/20/76; Order 71-13, § 296-04-420, filed 10/28/71.]

WAC 296-04-430 Reinstatement of program registration. Any apprenticeship program deregistered pursuant to these rules may be reinstated upon presentation of adequate evidence to the Council that the apprenticeship program is operating in accordance with these rules. [Order 71-13, § 296-04-430, filed 10/28/71.]

WAC 296-04-440 Adoption of consistent state plans. All apprenticeship programs registered with the Council shall comply with the requirements of WAC 296-04-300 through 296-04-480 within one year after the effective date of these rules. (1) The United States Department of Labor shall have authority to conduct compliance reviews to determine whether the Washington State affirmative action plan or any state

apprenticeship program registered with the Council is being administered or operated in accordance with the provisions of Title 29, Part 30 of the Code of Federal Regulations.

(2) It shall be the responsibility of the Council to take the necessary action to bring a noncomplying program into compliance with these rules. In the event the Council fails to fulfill this responsibility, the Secretary of the United States Department of Labor may withdraw the recognition for Federal purposes of any or all State apprenticeship programs, in accordance with the procedures for deregistration of programs registered by the Department, or refer the matter to the Attorney General of the United States with a recommendation for the institution by the Attorney General of a court action under Title 7 of the Civil Rights Act of 1964.

(3) The Council shall notify the United States Department of Labor of any State apprenticeship program disapproved and deregistered by it.

(4) Any state apprenticeship program disapproved and deregistered by the Council for noncompliance with the requirements of these rules or Title 29, Part 30 of the Code of Federal regulations may, within 15 days of the receipt of the notice of disapproval and deregistration, appeal to the United States Department of Labor to set aside the determination of the State Apprenticeship Council. The Department shall make its determination on the basis of the record. The Department may grant the State program sponsor, the State Apprenticeship Council and the complainant, if any, the opportunity to present oral or written argument.

(5) **Withdrawal of Recognition.** Whenever the United States Department of Labor determines that reasonable cause exists to believe that the Council has not adopted or implemented a plan in accordance with the equal opportunity requirements of Title 29, Part 30 of the Code of Federal Regulations, it shall give notice to the Council and to appropriate State sponsors of this determination, stating specifically wherein the State's plan failed to meet such requirements and the United States Department of Labor proposes to withdraw recognition for Federal purposes from the State Apprenticeship Council unless within 15 days of the receipt of the notice, the Council complies with the provisions of Title 29, Part 30, of the Code of Federal Regulations or mails a request for a hearing to the Secretary of the United States Department of Labor.

(6) If within 15 days of the receipt of the notice provided for in subsection (5) of this section, the Council neither complies with the provisions of Title 29, Part 30 of the Code of Federal Regulations, nor mails a request for a hearing, the Secretary of the United States Department of Labor shall determine whether the Council has adopted or implemented a plan in accordance with the equal opportunity requirements of Title 29, Part 30 of the Code of Federal Regulations.

(7) If within 15 days of the receipt of the notice provided for in subsection (5) of this section, the Council mails a request for a hearing, the Secretary of the United States Department of Labor shall proceed in accordance with Title 29, Section 30.16 of the Code of Federal Regulations.

(8) If a hearing is conducted in accordance with Title 29, Section 30.16 of the Code of Federal Regulations, the Secretary of the United States Department of Labor upon receipt of the proposed findings and recommended decision of the hearing officer shall make a final decision of whether the Council has adopted or implemented a plan in accordance with equal opportunity requirements of Title 29 of Part 30 of the Code of Federal Regulations.

(9) If the Secretary of the United States Department of Labor determines to withdraw from recognition, for Federal purposes, from the State Apprenticeship Council, he shall notify the Council of his determination. He shall also notify the State's sponsors that within 30 days of the receipt of the notice the United States Department of Labor shall cease to recognize, for Federal purposes, each State apprenticeship program unless the State program sponsor requests registration with the Department. Such registration may be granted contingent upon finding that the State apprenticeship program is operating in accordance with the requirements of Title 29, Part 30 of the Code of Federal Regulations.

(10) If the Secretary of the United States Department of Labor determines to withdraw recognition, for Federal purposes, from the State Apprenticeship Council, such recognition may be reinstated upon presentation of adequate evidence to the Secretary of the United States Department of Labor that the Council has adopted and implemented a plan carrying out the equal opportunity requirements of Title 29, Part 30 of the Code of Federal Regulations. [Order 71-13, § 296-04-440, filed 10/28/71.]

WAC 296-04-460 Intimidatory or retaliatory acts. Any intimidation, threat, coercion, or retaliation by or with the approval of any sponsor against any person for the purpose of interfering with any right or privilege secured by Title VII of the Civil Rights Act of 1964, Executive Order 11246 of September 24, 1965, or because he has made a complaint, testified, assisted or participated in any manner in an investigation proceeding, or hearing under these rules or Title 29, Part 30 of the Code of Federal Regulations, shall be considered non-compliance with the equal opportunity standards of these rules. The identity of complainants shall be kept confidential except to the extent necessary to carry out the purpose of these rules, including the conduct of any investigation, hearing, or judicial proceeding arising therefrom. [Order 71-13, § 296-04-460, filed 10/28/71.]

WAC 296-04-470 Nondiscrimination. The commitments contained in the sponsor's affirmative action program are not intended and shall not be used to discriminate against any qualified applicant or apprentice on the basis of race, color, religion, national origin, or sex. [Order 71-13, § 296-04-470, filed 10/28/71.]

WAC 296-04-480 Exemptions. Requests for exemption from these rules, or any part thereof, shall be made in writing to the Supervisor, and shall contain a

statement of reasons supporting the request. The exemptions may be granted for good cause by the Council, or the Secretary of the United States Department of Labor, and the Council shall notify the United States Department of Labor of any such exemptions granted affecting a substantial number of employers and the reasons therefor. These variances are intended to apply only to WAC 296-04-300 through 296-04-480, the affirmative action plan of the State Apprenticeship and Training Council. [Order 76-4, § 296-04-480, filed 2/20/76; Order 71-13, § 296-04-480, filed 10/28/71.]

WAC 296-04-490 Appeal. Any person, corporation, partnership, employer of sponsor aggrieved by any action taken, or the failure to take action when requested under the provisions of WAC 296-04-300 through WAC 296-04-480 may appeal to the Council in accordance with the requirements of WAC 296-04-290. [Order 71-13, § 296-04-490, filed 10/28/71.]

Chapter 296-06 WAC PUBLIC RECORDS

WAC	Purpose.
296-06-010	Description of organization of the department.
296-06-020	Location of established places where information about the department may be obtained and department's public records inspected and copied.
296-06-030	Operations and procedures.
296-06-040	Rules of procedure, substantive rules, general policy statements, and interpretations of general applicability.
296-06-050	Authorization for release of information.
296-06-080	Public records officer.
296-06-090	Office hours.
296-06-100	Requests for public records.
296-06-110	Copying and fees.
296-06-120	Denials of requests for public records.
296-06-130	Review of denials of requests for inspection or copying of public records.
296-06-140	Protection of public records.
296-06-150	Records index.
296-06-170	Appendix A—Form—Department of Labor and Industries authorization to inspect or copy public records in which an individual has a right of privacy.
296-06-990	Appendix B—Form—Request for public records under the provisions of chapter 1, Laws of 1973 (Initiative 276).
296-06-99001	

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-06-060	Substantive rules, general policy statements and interpretations of general applicability. [Order 73-12, § 296-06-060, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
296-06-070	Public records available. [Order 73-12, § 296-06-070, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
296-06-160	Procedure for copying public records. [Order 73-12, § 296-06-160, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
296-06-180	Department final opinions and orders not indexed. [Order 73-12, § 296-06-180, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
296-06-190	Instructions to staff in individual cases not indexed. [Order 73-12, § 296-06-190, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.

- 296-06-200 Factual staff reports, etc., not indexed in individual cases. [Order 73-12, § 296-06-200, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
- 296-06-210 Correspondence and materials not indexed. [Order 73-12, § 296-06-210, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
- 296-06-220 Communications regarding public records. [Order 73-12, § 296-06-220, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
- 296-06-230 Adoption of form. [Order 73-12, § 296-06-230, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.
- 296-06-240 Maintenance of index. [Order 73-11, § 296-06-240, filed 7/31/73.] Repealed by Order 76-27, filed 9/28/76.

WAC 296-06-010 Purpose. The department of labor and industries is a department of state government created by RCW 43.17.010. It shall hereafter in this chapter be referred to as the "department." Where appropriate, department also refers to its staff and employees. The department promulgates this chapter to ensure compliance with the provisions of chapter 42.17 RCW, and in particular with sections of that act dealing with public records. [Order 76-27, § 296-06-010, filed 9/28/76; Order 73-12, § 296-06-010, filed 7/31/73.]

WAC 296-06-020 Description of organization of the department. (1) **Central Organization.** The chief executive officer of the department is the director of labor and industries, hereinafter called "director." He is appointed by the governor with the consent of the senate to hold office at the pleasure of the governor. The department is organized in five divisions: Industrial insurance, industrial safety and health, industrial relations, apprenticeship, and building and construction safety inspection services. Each division is headed by an assistant director appointed by the director, but in the case of the division of apprenticeship, the director's selection must be confirmed by the Washington State Apprenticeship Council, whose members are also appointed by the director. The department also has a section to administer the Crime Victims Act, chapter 7.68 RCW. This section is also headed by an assistant director appointed by the director. Major policy decisions, rule-making, and the primary administrative functions of the department are carried out by the department's central organizations in Olympia. The director also serves as chairman of the five-member state board of pilotage commissioners but that board is not a part of the department.

(2) **Field Organization.** (a) The department maintains service locations or major field offices in fifteen cities. Each of these offices is headed by a district manager.

(b) The department-owned rehabilitation center in Seattle is headed by a superintendent. [Order 76-27, § 296-06-020, filed 9/28/76; Order 73-12, § 296-06-020, filed 7/31/73.]

WAC 296-06-030 Location of established places where information about the department may be obtained and department's public records inspected and copied. (1) **Olympia Office.** (a) The office of the director, the administrative office of the department, the main offices of the division of industrial insurance, the office of the public records officer are in the General Administration Building, Olympia, Washington. The main offices of the

other divisions are located at the following places: Industrial safety and health at 308-318 East Fourth Avenue, Olympia, Washington; apprenticeship at 318 East Fourth Avenue, Olympia, Washington; building and construction safety inspection services at 319 East Fourth Avenue, Olympia, Washington; and industrial relations and crime victims compensation at 208 Eleventh Avenue, Olympia, Washington. General information about the department and its divisions may be obtained at these places.

(2) **Field Offices.** (a) General information about the department may also be obtained at its service locations or major field offices at the following places:

- Aberdeen, P.O. Box 66, 2700 Simpson Avenue, 98520
- Bellingham, P.O. Box 608, 2500 Elm Street, Suite F, 98225
- Bremerton, P.O. Box 307, 245 Fourth Street Building, Suite 501, 98310
- Ephrata, P.O. Box 906, 21 "C" Street, Southwest, 98823
- Everett, P.O. Box 67, Eastmont Plaza, 98206
- Kennewick, P.O. Box 6126, 130 Vista Way, 99336
- Longview, P.O. Box 578, 1342 12th Avenue, 98632
- Mount Vernon, P.O. Box 189, 2021 College Way, 98273
- Port Angeles, 405 East 8th, 98362
- Seattle, 300 West Harrison, 98119
- Spokane, 1322 North Post Street, 99201
- Tacoma, 122 Public Service Building, 1305 Tacoma Avenue South, 98402
- Vancouver, P.O. Box 331, 601 West Evergreen Boulevard, 98660
- Walla Walla, 1750 Portland Avenue, Eastgate Professional Building, 99362
- Wenatchee, P.O. Box 597, 1139 Princeton, 98801
- Yakima, P.O. Box 527, 1011 South Third Street, 98907

(b) Information about the extended care services offered injured workers including physical therapy, special instruction, or vocational counseling may be obtained from the department's rehabilitation center at 4730 32nd Avenue South and Alaska Street, P.O. Box 18289, Columbia Station, Seattle, Washington 98118. [Order 76-27, § 296-06-030, filed 9/28/76; Order 73-12, § 296-06-030, filed 7/31/73.]

WAC 296-06-040 Operations and procedures. The general course and method of channeling and determining the operations of the five divisions of the department and the nature of requirements of all formal and informal procedures connected therewith are summarized in the following subsections:

(1) **Industrial Insurance.** This division administers medical care and payment of disability compensation for workers (or their dependents or survivors) sustaining job injuries or occupational diseases. Virtually all employers in the state must provide this industrial insurance coverage. The medical program of the state fund is funded through payments by employers and employees. The

disability payments by the state fund are funded by premiums collected from employers. Descriptions of procedures to be followed by employers and employees are outlined in department publications entitled "A Guide For Employers" and "Guide to Workers' Compensation Benefits."

This division also certifies certain employers to become "self-insured," which means that they are permitted to pay the legally defined industrial insurance benefits from their own funds. After this division certifies an employer as a self-insurer, it monitors all claims for injury benefits to make certain employees receive all rightful benefits.

(2) **Industrial Safety and Health.** This division endeavors to prevent job injuries and illnesses by adopting and enforcing safety and health standards and by training employers and employees in safe working procedures. It administers the Washington Industrial Safety and Health Act (WISHA), operating under a state plan agreement with the federal Occupational Safety and Health Administration (OSHA). Employer and employee procedures are outlined in the department's publication, "A Guide to WISHA."

(3) **Industrial Relations.** This division administers the laws regulating wages, hours, and working conditions. The division enforces the Minimum Wage Law and may assist in the collection of claims for unpaid wages. The industrial statistician determines the "prevailing rate of wage" on public works contracts and gathers information on wages and conditions of labor in the state, the consumer price index, standard family budgets, and manpower data on the labor force, employment, unemployment, and earnings. The section headed by the supervisor of employment standards administers the state employment standard designed to protect the health, safety, and welfare of virtually all nonagricultural employees. This section also issues minor work permits designed to protect young workers from exploitation and hazardous environments. Industrial relations agents investigate complaints of violations of employment standards, the Minimum Wage Law and other wage laws; hold conferences between employees and employers; inspect records; make investigations to determine whether or not there have been violations of statutes, rules, or regulations; and suggest remedial actions.

(4) **Apprenticeship.** This division, with the Washington State Apprenticeship and Training Council, administers the apprenticeship training law for those persons desiring to become skilled in any one of various trades, crafts, and services. Local joint apprenticeship committees throughout the state are responsible for the actual training. This division acts as a liaison between these committees and the council to make certain that the policies of the council are followed uniformly. The division also administers on-the-job training programs for those persons training in occupations other than apprenticeable occupations.

(5) **Building and Construction Safety Inspection Services.** This division administers programs designed to protect the life, health, and property of the general public. The various sections of this division issue licenses; promulgate rules and regulations; certify standards; and

ensure compliance. The division conducts electrical inspections; registers electrical contractors; inspects and regulates the use of boilers and pressure vessels; inspects elevators; ensures compliance with the standards for the manufacture, lease, and sale of mobile homes and recreational vehicles; enforces the statutes, rules, and regulations governing factory-built structures; licenses plumbers and electricians; and tests and registers general and specialty contractors.

(6) **Crime Victims Compensation.** This section pays medical and disability benefits to innocent victims of criminal acts (or to their dependents or survivors) who sustain injuries as a result thereof. Funds for this program are appropriated by the legislature from the state general fund. Benefit payments and procedures are outlined in the department's publication "When Crime Strikes."

(7) **State Board of Pilotage Commissioners.** This board is not a part of the department but is included here because by statute the director of the department of labor and industries is its chairman and because RCW 88.16.020 names the department of labor and industries as its office and record-keeper. Other members include: Two pilots' representatives and two shipping company representatives. This board regulates pilotage services for ships moving in Puget Sound and adjacent inland waters, Grays Harbor and Willapa Bay. To carry out its responsibilities, the board establishes qualifications for, examines, and licenses pilots. It also fixes pilotage rates and enforces provisions of the law relating to safe pilotage. [Order 76-27, § 296-06-040, filed 9/28/76; Order 73-12, § 296-06-040, filed 7/31/73.]

WAC 296-06-050 Rules of procedure, substantive rules, general policy statements, and interpretations of general applicability. The department's rules of procedure, substantive rules of general applicability, and statements of general policy and interpretations of general applicability adopted as authorized by law are contained in Title 296 WAC. [Order 76-27, § 296-06-050, filed 9/28/76; Order 73-12, § 296-06-050, filed 7/31/73.]

WAC 296-06-080 Authorization for release of information. Any person having a right of privacy in any records of the department may authorize the inspection and copying of any such records by persons not otherwise so authorized by providing the department with a signed and dated written authorization describing the records covered by the authorization, and naming the person or persons authorized to inspect and copy. No such authorization shall be valid until submitted to the department. [Order 76-27, § 296-06-080, filed 9/28/76; Order 73-12, § 296-06-080, filed 7/31/73.]

WAC 296-06-090 Public records officer. The department's public records officer shall have charge of its public records. He shall have his office in the administrative office of the department at Olympia, Washington. He shall be responsible for the enforcement of the department's rules and regulations regarding the release of public records, and shall ensure compliance

and cooperation of the department's staff with the public records disclosure requirements of chapter 42.17 RCW. He may choose such designees as may be necessary. [Order 76-27, § 296-06-090, filed 9/28/76; Order 73-12, § 296-06-090, filed 7/31/73.]

WAC 296-06-100 Office hours. The customary office hours of the department for the purpose of inspection and copying of any of the department's public records as provided by this chapter shall be from 8:00 a.m. to noon and from 1:00 p.m. to 5:00 p.m., Monday through Friday, excluding legal holidays. [Order 76-27, § 296-06-100, filed 9/28/76; Order 73-12, § 296-06-100, filed 7/31/73.]

WAC 296-06-110 Requests for public records. Persons requesting opportunity to copy or inspect the department's public records shall follow these procedures:

(1) Informal requests may be made orally or in written form to any of the department's service locations or its office in Olympia.

(2) The department may require a person who has made an informal request to submit a formal request.

(3) All formal requests shall be in writing on the form entitled: "Request for Public Record." Copies of said form shall be maintained in the department's offices in Olympia and at each service location.

(4) All formal requests shall be submitted by mail or personally to the assistant director who heads the division or the section from which records are being requested.

(5) Each formal request shall include the following information:

(a) The name of the person or persons making the request;

(b) The time of day and calendar date on which the request is made;

(c) The nature of the request, including description of the requested records by title, subject matter, date, and other means of enabling the staff of the department to identify the requested records and make them available.

(6) The staff of the department shall assist any person making a request, whether formal or informal, in identifying the requested record or records but in the event the records cannot be identified, the department shall so advise the person making the request, and, in the case of formal requests, return the formal request for resubmission with additional description of the requested records.

(7) When any request is made to inspect and copy material in files and records where a right of privacy is involved, or when such files and records are exempt by any other provision of law, inspection and copying shall not be permitted until the authorization described in WAC 296-06-080, together with a formal request, is presented to the assistant director for the division involved. The assistant director shall make a record of all such authorizations. The authorization shall be immediately attached to such files and records and shall become a part thereof. [Order 76-27, § 296-06-110, filed 9/28/76; Order 73-12, § 296-06-110, filed 7/31/73.]

WAC 296-06-120 Copying and fees. Where copies of public records are requested, the department may charge a fee of ten cents for each letter-size or legal-size copy for reimbursement of its actual costs incident to such copying. For each paper copy of a microfilmed record, the department may charge 20 cents per copy. Whenever copies of public records are mailed to the person making the request, the department may require reimbursement for postage costs. All copies made at the request of persons desiring copies on copy equipment of the department will be made by department staff at times when the making of such copies will not unreasonably disrupt the operations of the department. If the records to be copied contain information that would violate any right of personal privacy, the department staff member shall prevent such information from appearing on any copy. Where the use of such equipment does not harm the public records or impede the normal work of the department, those requesting copies of public records may use their own copying equipment and paper without charge, but in such event the department staff will supervise the copying at all times. [Order 76-27, § 296-06-120, filed 9/28/76; Order 73-12, § 296-06-120, filed 7/31/73.]

WAC 296-06-130 Denials of requests for public records. Only the public records officer shall have the power to make a denial of a request for public records. Action on all such requests shall be prompt. In cases of informal requests, any member of the department's staff to whom an informal request is made may require the person making the request to submit a formal request or such staff member may bring the matter to the attention of the assistant director or his designee of the division from which records are being requested.

A decision on a formal request may be deferred for a reasonable time but immediate written notice of such deferral shall be given. All denials of requests for public records shall be in written form. All denials shall include a statement specifying the reason for the denial, a statement of any exemption authorizing withholding the record and a brief explanation of how the exemption applies to the record withheld, and shall be signed by the public records officer or his designee. [Order 76-27, § 296-06-130, filed 9/28/76; Order 73-12, § 296-06-130, filed 7/31/73.]

WAC 296-06-140 Review of denials of requests for inspection or copying of public records. After any request for inspection or copying is denied, any person may petition the department to review its denial. Any such petition for review must be made in writing to the public records officer prior to the end of the second business day following the denial. Such petition shall specifically refer to the denial and shall contain a brief statement or any reasons for reconsideration of the denial. Any such petition shall be immediately referred to the director or such persons as he may designate to review such petitions. The person reviewing such petitions shall promptly review and reconsider the matter and either affirm or reverse the denial and communicate the decision promptly to the person submitting the petition. [Order

76-27, § 296-06-140, filed 9/28/76; Order 73-12, § 296-06-140, filed 7/31/73.]

WAC 296-06-150 Protection of public records. The department shall protect public records from damage or disorganization and prevent excessive interference with other essential functions of the department. All inspections of public records shall be supervised by a department staff member. Any staff member supervising public records inspection may decline to act upon the requests of person who are intoxicated, violent, abusive, threatening, or disruptive, and may terminate the inspection or copying of public records by such persons. Any staff member supervising public records inspection will at all times insure that those inspecting the department's public records do not tear, mutilate, mark, or otherwise harm such records and shall terminate the inspection or copying of public records by any person who has harmed such records. The staff member may limit inspection and copying to any extent necessary to prevent such activity from unreasonably disrupting the department's operations. Any staff member supervising public records inspection shall at all times provide full, prompt, courteous assistance to persons requesting the inspection and copying of the department's public records. [Order 76-27, § 296-06-150, filed 9/28/76; Order 73-12, § 296-06-150, filed 7/31/73.]

WAC 296-06-170 Records index. The department of labor and industries will not maintain a current index as provided for in RCW 42.17.260(2). As provided in RCW 42.17.260(3), this formal order is issued and published specifying the reasons why and the extent to which maintenance of such a current index would unduly burden or interfere with the operations of the department.

(1) It would both unduly burden and interfere with department operations to maintain a current index with the items specified in RCW 42.17.260(2)(a), "final opinions, including concurring and dissenting opinions, as well as orders, made in the adjudication of cases," as the department through its several divisions, sections, and other subdivisions routinely and regularly issues a great number of determinative orders. The division of industrial insurance alone is estimated to issue daily an average of about 1,200 to 2,000 or more determinative orders. It is estimated that the division of industrial safety and health averages over 60 orders daily. While other divisions, sections, and subdivisions have a lesser volume of orders, it would be unduly burdensome for the department to index all of the materials which would come within the scope of RCW 42.17.260(2)(a). To index all such orders would either require more personnel and consequent expense or reduce the level of handling the essential functions and result in constantly greater periods of delay. Furthermore, all indexes maintained for departmental use by the various divisions, sections, and subdivisions of the department for internal use will remain available for public inspection and copying where permitted by law.

Accordingly, and for the above reasons, it is ordered that the public records officer not establish an index relative to such subject matter.

(2) It would both unduly burden and interfere with the department's operations to maintain a current index with all "instructions to staff that affect a member of the public" within the scope of RCW 42.17.260(2)(c). The inclusion of every such instruction to the staff would require either more personnel to index such instructions or a reduction in the department's capacity to carry out its other functions. The department will, however, as it has in the past, continue to make available to the public for inspection or copying all instructions of a general nature to its staff that affects members of the public.

Accordingly, and for the above reasons, it is ordered that the public records officer not establish an index relative to such subject matter.

(3) It would both unduly burden and interfere with department operations to maintain a current index of all "factual staff reports and studies, scientific reports and studies, and any other factual information derived from tests, studies, reports, or surveys, whether conducted by public employees or others" within the scope of RCW 42.17.260(2)(3). Further, many of the items covered by that description may be protected by rights of privacy, involve specific intelligence information and specific investigative files compiled by the department in its investigative capacities, involve the rights of privacy of a taxpayer, reveal the identity of persons who file complaints with the department in its investigative capacities, reveal valuable formulae, designs, drawings, or research data, disclosure of which would produce private gain and public loss, or involve records relevant to a controversy to which the department is a party but which records would not be available to another party under the rules of pretrial discovery for causes pending in the superior court. The department regularly and routinely has physical examinations conducted of injured workers and maintains the reports of such examinations in its confidential claim files. The indexing of such reports would be highly burdensome. Such reports are available to persons authorized to inspect them by the injured workers, to the employer, and to public officers in the course of their duties. To make such information available to the public at large would, quite apart from any question of violations of rights of privacy, subject the department to great inconvenience. For the foregoing reasons the department will continue to make available for inspection and copying only the material described in RCW 42.17.260(2)(3) which is of a general nature and does not involve any rights of privacy or the other points mentioned above.

Accordingly, and for the above reasons, it is ordered that the public records officer not establish an index relative to such subject matter.

(4) It would both unduly burden and interfere with department operations to maintain a current index of the materials within the scope of RCW 42.17.260(2)(f), that is, all "correspondence, and materials, referred to therein, by and with the agency relating to any regulatory, supervisory or enforcement responsibilities of the agency, whereby the agency determines, or opines upon, or is

asked to determine or opine upon, the rights of the state, the public, a subdivision of state government, or of any private party." The department daily, routinely, and regularly receives and sends a vast amount of material fitting this description. It would require either a greatly increased staff to index everything of that nature or a drastic reduction of the department's ability to carry out its other essential functions. Also, much of the material is incorporated in confidential claim files or is otherwise subject to rights of privacy or is exempt from public inspection and copying by the provisions of RCW 42.17-.310. Materials relating to the claims of injured workers are available to the employer, to public employees in the performance of their official duties and persons authorized by the injured worker. The various divisions, sections, and parts of the department maintain internal indexes which are available for public inspection.

Accordingly, and for the above reasons, it is ordered that the public records officer not establish an index relative to such subject matter.

(5) The department did maintain a current index of the matters not covered by subsections (1) through (4) for nearly three years following the promulgation of its initial set of public records rules which was filed with the office of the code reviser on July 31, 1973. That index was virtually never asked for, nor was it used to any extent at all by the public. The department devoted many manhours that could have been put to accomplishment of its statutory duties to prepare and maintain that current index. The department finds it has been unduly burdensome to make the extensive effort necessary to maintain such a current index in the face of almost complete public apathy. Therefore, pursuant to RCW 42.17.260(3), the department issues and publishes this formal order specifying the reasons why and the extent to which compliance with any of the provisions of RCW 42.17.260(2) requiring the maintenance of a current index would unduly burden or interfere with its operations. The department herewith states that it will not hereafter maintain such a current index. The department further states that it will, however, make available for public inspection and copying all indexes and lists, not otherwise exempt, maintained for normal agency use. Guidance to public records available through the department will be provided by the public records officer upon request. [Order 76-27, § 296-06-170, filed 9/28/76; Order 73-12, § 296-06-170, filed 7/31/73.]

WAC 296-06-990 Appendix A—Form—Department of Labor and Industries authorization to inspect or copy public records in which an individual has a right of privacy.

APPENDIX A.

DEPARTMENT OF LABOR AND INDUSTRIES
AUTHORIZATION TO INSPECT OR COPY
PUBLIC RECORDS
IN WHICH AN INDIVIDUAL HAS A RIGHT OF
PRIVACY

I, _____ residing at _____, hereby authorize _____ to inspect and/or copy any records of the Department of Labor and Industries relating to me, the disclosure of which records without my permission would violate my rights of privacy.

Dated this _____ day of _____, 197...

Signature

[Order 73-12, Appendix A (codified as WAC 296-06-990), filed 7/31/73.]

WAC 296-06-99001 Appendix B—Form—Request for public records under the provisions of chapter 1, Laws of 1973 (Initiative 276).

DEPARTMENT OF LABOR AND INDUSTRIES
APPENDIX B.

Request for Public Records under the Provisions of chapter 1, Laws of 1973 (Initiative 276)

Name: _____
Date: _____
Time: _____

Please state the nature of your request:

Please identify the public records you wish to inspect by reference to the department's current index or if the records are not so indexed, please describe the records to enable the public records officer or designee to find them. Also please indicate whether you wish to have copies made.

FOR DEPARTMENT USE ONLY:

Action taken on request: _____

Name of person taking the action: _____

Date action taken: _____

[Order 73-12, Appendix B (codified as WAC 296-06-99001), filed 7/31/73.]

Chapter 296-07 WAC
STATE ENVIRONMENTAL POLICY ACT
GUIDELINES

WAC

296-07-010	Use of abbreviations.
296-07-020	Purpose and scope.
296-07-030	Meaning of words and terms.
296-07-040	Exemptions.
296-07-050	Sufficiency of compliance with SEPA Guidelines.
296-07-060	Designation of responsible official.
296-07-070	Department's SEPA public information center.
296-07-080	Maintenance of EIS available register.
296-07-090	Exemption for emergency actions.
296-07-100	Chapter to be amended when SEPA Guidelines amended.
296-07-110	Consideration of economic values.

WAC 296-07-010 Use of abbreviations. In this chapter the department of labor and industries shall be referred to as the "department"; the director of labor and industries as the "director"; the State Environmental Policy Act, chapter 43.21C RCW, as "SEPA"; chapter 197-10 WAC effective January 16, 1976 as the "SEPA Guidelines"; and Environmental Impact Statement as "EIS." [Order 76-16, § 296-07-010, filed 5/20/76.]

WAC 296-07-020 Purpose and scope. The rules contained in this chapter are to carry out the policy and procedures of SEPA and the SEPA Guidelines, and shall govern the application of SEPA requirements to the Department. These rules are adopted pursuant to the requirement of and authority provided by chapter 43.21C RCW and chapter 197-10 WAC.

From the effective date of this chapter the Department in undertaking non-exempt actions shall conform to those relevant and applicable policies and procedures declared mandatory by the provisions of SEPA or the SEPA Guidelines. Such pertinent and mandatory policy and procedures are hereby incorporated by reference and adopted as the policy and procedures of the Department. [Order 76-16, § 296-07-020, filed 5/20/76.]

WAC 296-07-030 Meaning of words and terms. The words and terms in this chapter and in all proceedings of the department in compliance with SEPA shall be deemed to conform to the mandatory definitions contained in the SEPA Guidelines. [Order 76-16, § 296-07-030, filed 5/20/76.]

WAC 296-07-040 Exemptions. All activities under programs administered by the department as of December 12, 1975 are hereby exempted, except the issuance of any license for the manufacture of explosives or the adoption or amendment by the department of any regulations incorporating general standards respecting the issuance of licenses authorizing the storage of explosives pursuant to chapter 70.74 RCW.

The adoption of any industrial health or safety regulations containing noise standards shall be considered a major action under this chapter. In addition all other exemptions provided by SEPA or the SEPA Guidelines shall apply. [Order 76-16, § 296-07-040, filed 5/20/76.]

WAC 296-07-050 Sufficiency of compliance with SEPA Guidelines. Compliance with the applicable mandatory SEPA Guidelines as supplemented by this chapter shall be deemed to constitute compliance with this chapter. [Order 76-16, § 296-07-050, filed 5/20/76.]

WAC 296-07-060 Designation of responsible official. The assistant director of any department, division, or head of any independent department section with major responsibility for any non-exempt action shall be the responsible official for the purpose of complying with SEPA. In any other case the director shall be the responsible official or he shall designate another person to be the responsible official. [Order 76-16, § 296-07-060, filed 5/20/76.]

WAC 296-07-070 Department's SEPA public information center. There is hereby established a Department public information center to carry out the functions contemplated by the SEPA Guidelines, WAC 197-10-830, to be located in the offices of the Department at Olympia, Washington. The Department's public records officer shall have charge thereof. [Order 76-16, § 296-07-070, filed 5/20/76.]

WAC 296-07-080 Maintenance of EIS available register. The Department shall maintain an EIS Available Register at its SEPA public information center. Said register shall be in the charge of the Department's public records officer and it shall be available for public inspection and copying. [Order 76-16, § 296-07-080, filed 5/20/76.]

WAC 296-07-090 Exemption for emergency actions. When actions are exempted from the requirements of SEPA or the SEPA Guidelines because they are actions which must be taken immediately, or within a time too short to allow full compliance with SEPA or the SEPA Guidelines to avoid an imminent danger to public or private property, or to prevent an imminent threat of serious environmental degradation, the responsible official shall prepare a written statement showing the nature of the action and the reasons for immediate action. Such statement shall be filed in the Department's SEPA Public Information Center. [Order 76-16, § 296-07-090, filed 5/20/76.]

WAC 296-07-100 Chapter to be amended when SEPA Guidelines amended. When amendments are adopted to the SEPA Guidelines the Department shall adopt all amendments to this chapter within one hundred twenty days to bring this chapter into conformance with the SEPA Guidelines as amended. [Order 76-16, § 296-07-100, filed 5/20/76.]

WAC 296-07-110 Consideration of economic values. In promulgating rules in compliance with the SEPA Guidelines and any environmental, social, health, safety, or other standards connected therewith, the department shall, pursuant to chapter 117, Laws of 1975-'76 2nd ex. sess., give appropriate consideration to economic values

along with such other considerations. [Order 76-16, § 296-07-110, filed 5/20/76.]

Chapter 296-08 WAC PRACTICE AND PROCEDURE

WAC

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WAC 296-08-001 Effective date and validity. These rules of practice and procedure have been adopted by the department of labor and industries in accordance with the authority vested in it by law and pursuant to a hearing held at Olympia, Washington, on March 10, 1960. The effective date of these rules is March 18th, 1960. [Rule .08.591, effective 3/18/60, filed 3/23/60.]

WAC 296-08-010 Appearance and practice before agency—Who may appear. No person may appear in a representative capacity before the department or any division, board, commission or council thereof or its designated hearing officer 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 our state law.

(3) Persons otherwise qualified as possessing the requisite skill to appear and expertly represent others who have applied to the department or the division, board, commission or council thereof and have been duly authorized by the same to appear before it in a representative capacity.

(4) A bona fide officer, partner, or full time employee of an individual firm, association, partnership, or corporation. [Rule .08.010, effective 3/18/60, filed 3/23/60.]

WAC 296-08-020 Appearance and practice before agency—Appearance in certain proceedings may be limited to attorneys. In all hearings involving the taking of testimony and the formulation of a record subject to review by the courts, where the department or any division, board, commission or council thereof or its designated hearing officer determine that representative activity in such hearing requires a high degree of legal training, experience, and skill, the department or the division, board, commission or council thereof or its designated hearing officer may limit those who may appear in a representative capacity to attorneys at law. [Rule .08.020, effective 3/18/60, filed 3/23/60.]

WAC 296-08-030 Appearance and practice before agency—Solicitation of business unethical. It shall be unethical for persons acting in a representative capacity before the department or any division, board, commission or council thereof to solicit business by circulars, advertisements or by personal relations, provided that such representatives may publish or circulate business cards. It is equally unethical to procure business indirectly by solicitors of any kind. [Rule .08.030, effective 3/18/60, filed 3/23/60.]

WAC 296-08-040 Appearance and practice before agency—Standards of ethical conduct. All persons appearing in proceedings before the department of any division, board, commission or council thereof in 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 department or the division, board, commission or council thereof may decline to permit such person to appear in a representative capacity in any proceeding before it. [Rule .08.040, effective 3/18/60, filed 3/23/60.]

WAC 296-08-050 Appearance and practice before agency—Appearance by former employee of agency or former member of attorney general's staff. No former employee of the department or any division, board, commission or council thereof or member of the attorney general's staff may at any time after severing his employment with the department or the division, board, commission or council thereof or the attorney general appear, except with the written permission and in compliance with RCW 42.22.040, in a representative capacity on behalf of other parties in a formal proceeding wherein he previously took an active part as a representative of the department or any division, board, commission or council thereof. [Rule .08.050, effective 3/18/60, filed 3/23/60.]

WAC 296-08-060 Appearance and practice before agency—Former employee as expert witness. No former employee of the department or any division, board, commission or council thereof shall at any time after severing his employment with the department or the division, board, commission or council thereof appear, except with the written permission and in compliance with RCW 42.22.040, as an expert witness on behalf of other parties in a formal proceeding wherein he previously took an active part in the investigation as a representative of the department or any division, board, commission or council thereof. [Rule .08.060, effective 3/18/60, filed 3/23/60.]

WAC 296-08-070 Computation of time. In computing any period of time prescribed or allowed by the rules or by the order of the department or any division, board, commission or council thereof 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, unless it is a Saturday, Sunday or a legal holiday, in which event the period runs until the end of the next day which is neither a Saturday, Sunday nor a holiday. When the period of time prescribed or allowed is less than seven days, intermediate Saturdays, Sundays and holidays shall be excluded in the computation. [Rule .08.070, effective 3/18/60, filed 3/23/60.]

WAC 296-08-080 Notice and opportunity for hearing in contested cases. In any contested case, all parties shall be served with a notice at least 10 days before the date set for the hearing, unless otherwise prescribed by law, or unless all interested parties waive such notice in writing. The notice shall state the time, place, and issues involved, as required by RCW 34.04.090(2)(i). [Rule .08.080, effective 3/18/60, filed 3/23/60.]

WAC 296-08-090 Service of process—By whom served. The department or any division, board, commission or council thereof shall cause to be served all orders, notices and other papers issued by it, together with any other papers which it is required by law to serve. Every other paper shall be served by the party filing it. [Rule .08.090, effective 3/18/60, filed 3/23/60.]

WAC 296-08-100 Service of process—Upon whom served. All papers served by either the department or any division, board, commission or council thereof or any party shall be served upon all counsel of record at the time such filing and upon parties not represented by counsel or upon their agents designated by them by law. Any counsel entering an appearance subsequent to the initiation of the proceeding shall notify all other counsel then of record and all parties not represented by counsel of such fact. [Rule .08.100, effective 3/18/60, filed 3/23/60.]

WAC 296-08-110 Service of process—Service upon parties. The final order, and any other paper required to be served by the agency upon a party, shall be served upon such party or upon the agent designated by him or by law to receive service of such papers, and a copy shall be furnished to counsel of record. [Rule .08.110, effective 3/18/60, filed 3/23/60.]

WAC 296-08-120 Service of process—Methods of service. Service of papers shall be made personally or, unless otherwise provided by law, by first-class, or registered, or certified mail; or by telegraph. [Rule .08.120, effective 3/18/60, filed 3/23/60.]

WAC 296-08-130 Service of process—When service complete. Service upon parties shall be regarded as complete: By mail, upon deposit in the United States mail properly stamped and addressed; by telegraph, when deposited with a telegraph company properly addressed and with charges prepaid. [Rule .08.130, effective 3/18/60, filed 3/23/60.]

WAC 296-08-140 Service of process—Filing with agency. Papers required to be filed with the department or any division, board, commission or council thereof shall be deemed filed upon actual receipt by the department or the division, board, commission or council thereof at the place specified in its rules accompanied by proof of service upon parties required to be served. [Rule .08.140, effective 3/18/60, filed 3/23/60.]

WAC 296-08-150 Subpoenas—Where provided by law—Form. Every subpoena, where authorized by law, shall state "Department of labor and industries, state of Washington (name of appropriate division, board, etc.)" and the title of the proceeding, if any, and shall command the person to whom it is directed to attend and give testimony or produce designated books, documents or things under his control at a specified time and place. [Rule .08.150, effective 3/18/60, filed 3/23/60.]

WAC 296-08-160 Subpoenas—Issuance to parties. Upon application of counsel or other representative authorized to practice before the agency for any party to a contested case, there shall be issued to such party subpoenas requiring the attendance and testimony of witnesses or the production of evidence in such proceeding. Where authorized by law, the department, or any division, board, commission or council thereof may issue subpoenas to parties not so represented upon request or upon a showing of general relevance and reasonable scope of the testimony or evidence sought. [Rule .08.160, effective 3/18/60, filed 3/23/60.]

WAC 296-08-170 Subpoenas—Service. Unless the service of a subpoena is acknowledged on its face by the person subpoenaed, service shall be made by delivering a copy of the subpoena to such person and by tendering him on demand, if entitled to make such demand, the fees for one day's attendance and the mileage allowed by law. [Rule .08.170, effective 3/18/60, filed 3/23/60.]

WAC 296-08-180 Subpoenas—Fees. Witnesses summoned before the department or any division, board, commission or council thereof shall be paid by the party at whose instance they appear the same fees and mileage that are paid to witnesses in the superior courts of the state of Washington. [Rule .08.180, effective 3/18/60, filed 3/23/60.]

WAC 296-08-190 Subpoenas—Proof of service. The person serving the subpoena shall make proof of service by filing the subpoena and the required return, affidavit or acknowledgment of service with the department or the division, board, commission or council thereof or the officer before whom the witness is required to testify or produce evidence. If service is made by a person other than an officer of the department or the division, board, commission or council thereof and such service has not been acknowledged by the witness, such person shall make an affidavit of service. Failure to make proof of service does not affect the validity of the service. [Rule .08.190, effective 3/18/60, filed 3/23/60.]

WAC 296-08-200 Subpoenas—Quashing. Upon motion made promptly, and in any event at or before the time specified in the subpoena for compliance, by the person to whom the subpoena is directed (and upon notice to the party to whom the subpoena was issued) the department or the division, board, commission or council thereof or its authorized member or officer may (1) quash or modify the subpoena if it is unreasonable or requires evidence not relevant to any matter in issue, or (2) condition denial of the motion upon just and reasonable conditions. [Rule .08.200, effective 3/18/60, filed 3/23/60.]

WAC 296-08-210 Subpoenas—Enforcement. Upon application and for good cause shown, the department or any division, board, commission or council thereof will seek judicial enforcement of subpoenas,

where authorized by law, issued to parties and which have not been quashed. [Rule .08.210, effective 3/18/60, filed 3/23/60.]

WAC 296-08-220 Subpoenas—Geographical scope. Such attendance of witnesses and such production of evidence may be required from any place in the state of Washington, at any designated place of hearing. [Rule .08.220, effective 3/18/60, filed 3/23/60.]

WAC 296-08-370 Official notice—Matters of law. The department or any division, board, commission or council thereof or its hearing officer upon request made before or during a hearing, will officially notice:

(1) **Federal law.** The constitution; congressional acts, resolutions, records, journals and committee reports; decisions of federal courts and administrative agencies; executive orders and proclamations; and all rules, orders and notices published in the Federal Register.

(2) **State law.** The constitution of the state of Washington, acts of the legislature, resolutions, records, journals and committee reports; decisions of administrative agencies of the state of Washington, executive orders and proclamations by the governor; and all rules, orders and notices filed with the code revisor.

(3) **Governmental organization.** Organization, territorial limitations, officers, departments, and general administration of the government of the state of Washington, the United States, the several states and foreign nations.

(4) **Agency organization.** The department's or any division's, board's, commission's or council's thereof organization, administration, officers, personnel, official publications, and practitioners before its bar. [Rule .08.370, effective 3/18/60, filed 3/23/60.]

WAC 296-08-380 Official notice—Material facts. In the absence of controverting evidence, the department or any division, board, commission or council thereof and its hearing officers, upon request made before or during a hearing, may officially notice:

(1) **Agency proceedings.** The pendency of, the issue and position of the parties therein, and the disposition of any proceeding then pending before or theretofore concluded by the department or the division, board, commission or council thereof;

(2) **Business customs.** General customs and practices followed in the transaction of business;

(3) **Notorious facts.** Facts so generally and widely known to all well-informed persons as not to be subject to reasonable dispute, or specific facts which are capable of immediate and accurate demonstration by resort to accessible sources of generally accepted authority, including but not exclusively, facts stated in any publication authorized or permitted by law to be made by any federal or state officer, department, or agency;

(4) **Technical knowledge.** Matters within the technical knowledge of the department or the division, board, commission or council thereof as a body of experts, within the scope or pertaining to the subject matter of its statutory duties, responsibilities or jurisdiction;

(5) **Request or suggestion.** Any party may request, or the hearing officer or the department or the division, board, commission or council thereof may suggest, that official notice be taken of a material fact, which shall be clearly and precisely stated, orally on the record, at any prehearing conference or oral hearing or argument, or may make such request or suggestion by written notice, any pleading, motion, memorandum, or brief served upon all parties, at any time prior to a final decision;

(6) **Statement.** Where an initial or final decision of the department or the division, board, commission or council thereof rests in whole or in part upon official notice of a material fact, such fact shall be clearly and precisely stated in such decision. In determining whether to take official notice of material facts, the hearing officer of the department or the division, board, commission or council thereof may consult any source of pertinent information, whether or not furnished as it may be, by any party and whether or not admissible under the rules of evidence;

(7) **Controversion.** Any party may controvert a request or a suggestion that official notice of a material fact be taken at the time the same is made if it be made orally, or by a pleading, reply or brief in response to the pleading or brief or notice in which the same is made or suggested. If any decision is stated to rest in whole or in part upon official notice of a material fact which the parties have not had a prior opportunity to controvert, any party may controvert such fact by appropriate exceptions if such notice be taken in an initial or intermediate decision or by a petition for reconsideration if notice of such fact be taken in a final report. Such controversion shall concisely and clearly set forth the sources, authority and other data relied upon to show the existence or nonexistence of the material fact assumed or denied in the decision;

(8) **Evaluation of evidence.** Nothing herein shall be construed to preclude the department or the division, board, commission or council thereof or its authorized agents from utilizing their experience, technical competence, and specialized knowledge in the evaluation of the evidence presented to them. [Rule .08.380, effective 3/18/60, filed 3/23/60.]

WAC 296-08-390 Presumptions. Upon proof of the predicate facts specified in the following six subsections hereof without substantial dispute and by direct, clear, and convincing evidence, the department or the division, board, commission or council thereof with or without prior request or notice, may make the following presumptions, where consistent with all surrounding facts and circumstances:

(1) **Continuity.** That a fact of a continuous nature, provided to exist at a particular time, continues to exist as of the date of the presumption, if the fact is one which usually exists for at least that period of time;

(2) **Identity.** That persons and objects of the same name and description are identical;

(3) **Delivery.** Except in a proceeding where the liability of the carrier for nondelivery is involved, that mail matter, communications, express or freight, properly addressed, marked, billed and delivered respectively to the

post office, telegraph, cable or radio company, or authorized common carrier of property with all postage, tolls and charges properly prepaid, is or has been delivered to the addressee or consignee in the ordinary course of business;

(4) **Ordinary course.** That a fact exists or does not exist, upon proof of the existence or nonexistence of another fact which in the ordinary and usual course of affairs, usually and regularly co-exists with the fact presumed;

(5) **Acceptance of benefit.** That a person for whom an act is done or to whom a transfer is made has, does or will accept same where it is clearly in his own self-interest so to do;

(6) **Interference with remedy.** That evidence, with respect to a material fact which in bad faith is destroyed, eloiigned, suppressed or withheld by a party in control thereof, would if produced, corroborate the evidence of the adversary party with respect to such fact. [Rule .08.390, effective 3/18/60, filed 3/23/60.]

WAC 296-08-400 Stipulations and admissions of record. The existence or nonexistence of a material fact, as made or agreed in a stipulation or in an admission of record, will be conclusively presumed against any party bound thereby, and no other evidence with respect thereto will be received upon behalf of such party, provided:

(1) **Upon whom binding.** Such a stipulation or admission is binding upon the parties by whom it is made, their privies and upon all other parties to the proceeding who do not expressly and unequivocally deny the existence or nonexistence of the material fact so admitted or stipulated, upon the making thereof, if made on the record at a prehearing conference, oral hearing, oral argument or by a writing filed and served upon all parties within five days after a copy of such stipulation or admission has been served upon them;

(2) **Withdrawal.** Any party bound by a stipulation or admission or record at any time prior to final decision may be permitted to withdraw the same in whole or in part by showing to the satisfaction of the hearing officer or the department or the division, board, commission or council thereof that such stipulation or admission was made inadvertently or under a bona fide mistake of fact contrary to the true fact and that its withdrawal at the time proposed will not unjustly prejudice the rights of other parties to the proceeding. [Rule .08.400, effective 3/18/60, filed 3/23/60.]

WAC 296-08-410 Form and content of decisions in contested cases. Every decision and order, whether proposed, initial, or final, shall:

(1) Be correctly captioned as to name of agency and name of proceeding;

(2) Designate all parties and counsel to the proceeding;

(3) Include a concise statement of the nature and background of the proceeding;

(4) Be accompanied by appropriate numbered findings of fact and conclusions of law;

(5) Whenever practical, include the reason or reasons for the particular order or remedy afforded;

(6) Wherever practical, be referenced to specific provisions of the law and/or regulations appropriate thereto, together with reasons and precedents relied upon to support the same. [Rule .08.410, effective 3/18/60, filed 3/23/60.]

WAC 296-08-420 Definition of issues before hearing. In all proceedings the issues to be adjudicated shall be made initially as precise as possible, in order that hearing officers may proceed promptly to conduct the hearings on relevant and material matter only. [Rule .08.420, effective 3/18/60, filed 3/23/60.]

WAC 296-08-430 Prehearing conference rule—Authorized. In any proceeding the department or any division, board, commission or council thereof or its designated hearing officer upon its or his own motion, or upon the motion of one of the parties or their qualified representatives, may in its or his discretion direct the parties or their qualified representatives to appear at a specified time and place for a conference to consider:

- (1) The simplification of the issues;
- (2) The necessity of amendments to the pleadings;
- (3) The possibility of obtaining stipulations, admissions of facts and of documents;
- (4) The limitation of the number of expert witnesses;
- (5) Such other matters as may aid in the disposition of the proceeding. [Rule .08.430, effective 3/18/60, filed 3/23/60.]

WAC 296-08-440 Prehearing conference rule—Record of conference action. The department of the division, board, commission or council thereof or its designated hearing officer shall make an order or statement which recites the action taken at the conference, the amendments allowed to the pleadings and the agreements made by the parties or their qualified representatives as to any of the matters considered, including the settlement or simplification of issues, and which limits the issues for hearing to those not disposed of by admissions or agreements; and such order or statement shall control the subsequent course of the proceeding unless modified for good cause by subsequent order. [Rule .08.440, effective 3/18/60, filed 3/23/60.]

WAC 296-08-450 Submission of documentary evidence in advance. Where practical the department or the division, board, commission or council thereof or its designated hearing officer may require:

(1) That all documentary evidence which is to be offered during the taking of evidence be submitted to the hearing examiner and to the other parties to the proceeding sufficiently in advance of such taking of evidence to permit study and preparation of cross-examination and rebuttal evidence.

(2) That documentary evidence not submitted in advance, as may be required by subsection (1), be not received in evidence in the absence of a clear showing that the offering party had good cause for his failure to produce the evidence sooner;

(3) That the authenticity of all documents submitted in advance in a proceeding in which such submission is required, be deemed admitted unless written objection thereto is filed prior to the hearing, except that a party will be permitted to challenge such authenticity at a later time upon a clear showing of good cause for failure to have filed such written objection. [Rule .08.450, effective 3/18/60, filed 3/23/60.]

WAC 296-08-460 Excerpts from documentary evidence. When portions only of a document are to be relied upon, the offering party shall prepare the pertinent excerpts, adequately identified, and shall supply copies of such excerpts, together with a statement indicating the purpose for which such materials will be offered, to the hearing examiner and to other parties. Only the excerpts, so prepared and submitted, shall be received in the record. However, the whole of the original document shall be made available for examination and for use by all parties to the proceeding. [Rule .08.460, effective 3/18/60, filed 3/23/60.]

WAC 296-08-470 Expert or opinion testimony and testimony based on economic and statistical data—Number and qualifications of witnesses. That the hearing examiner or other appropriate officer in all classes of cases where practicable make an effort to have the interested parties agree upon the witness or witnesses who are to give expert or opinion testimony, either by selecting one or more to speak for all parties or by limiting the number for each party; and, if the interested parties cannot agree, require them to submit to him to the other parties written statements containing the names, addresses and qualifications of their respective opinion or expert witnesses, by a date determined by him and fixed sufficiently in advance of the hearing to permit the other interested parties to investigate such qualifications. [Rule .08.470, effective 3/18/60, filed 3/23/60.]

WAC 296-08-480 Expert or opinion testimony and testimony based on economic and statistical data—Written sworn statements. That the hearing examiner or other appropriate officer, in all classes of cases in which it is practicable and permissible, require, and when not so permissible, make every effort to bring about by voluntary submission, that all direct opinion or expert testimony and all direct testimony based on economic or statistical data be reduced to written sworn statements, and, together with the exhibits upon which based, be submitted to him and to the other parties to the proceeding by a date determined by the hearing officer and fixed a reasonable time in advance of the hearing; and that such sworn statements be acceptable as evidence upon formal offer at the hearing, subject to objection on any ground except that such sworn statements shall not be subject to challenge because the testimony is not presented orally, and provided that witnesses making such statements shall not be subject to cross-examination unless a request is made sufficiently in advance of the hearing to insure the presence of the witnesses. [Rule .08.480, effective 3/18/60, filed 3/23/60.]

WAC 296-08-490 Expert or opinion testimony and testimony based on economic and statistical data—Supporting data. That the hearing examiner or other appropriate officer, in his discretion but consistent with the rights of the parties, cause the parties to make available for inspection in advance of the hearing, and for purposes of cross-examination at the hearing, the data underlying statements and exhibits submitted in accordance with WAC 296-08-480, but, wherever practicable that he restrict to a minimum the placing of such data in the record. [Rule .08.490, effective 3/18/60, filed 3/23/60.]

WAC 296-08-500 Expert or opinion testimony and testimony based on economic and statistical data—Effect of noncompliance with WAC 296-08-470 or 296-08-480. Whenever the manner of introduction of opinion or expert testimony or testimony based on economic or statistical data is governed by requirements fixed under the provisions of WAC 296-08-470 or 296-08-480, such testimony not submitted in accordance with the relevant requirements shall not be received in evidence in the absence of a clear showing that the offering party had good cause for his failure to conform to such requirements. [Rule .08.500, effective 3/18/60, filed 3/23/60.]

WAC 296-08-510 Continuances. Any party who desires a continuance shall, immediately upon receipt of notice of hearing, or as soon thereafter as requiring such continuance come to his knowledge, notify the department or the division, board, commission or council thereof or its designated hearing officer of said desire, stating in detail the reasons why such continuance is necessary. The department or the division, board, commission or council thereof or its designated hearing officer, in passing upon a request for continuance, shall consider whether such request was promptly and timely made. For good cause shown the department or the division, board, commission or council thereof or its designated hearing officer may grant such a continuance and may at any time order a continuance upon its or his own motion. During a hearing, if it appears in the public interest or in the interest of justice that further testimony or argument should be received, the examiner or other officer conducting the hearing may in his discretion continue the hearing and fix a date for introduction of additional evidence or presentation of argument. Such oral notice shall constitute final notice of such continued hearing. [Rule .08.510, effective 3/18/60, filed 3/23/60.]

WAC 296-08-520 Rules of evidence—Admissibility criteria. Subject to the other provisions of these rules, all relevant evidence is admissible which, in the opinion of the officer conducting the hearing, is the best evidence reasonably obtainable, having due regard for its necessity, availability and trustworthiness. In passing upon the admissibility of evidence, the officer conducting the hearing shall give consideration to, but shall not be bound to follow, the rules of evidence governing civil proceedings in matters not involving trial by jury, in the

superior court of the state of Washington. [Rule .08.520, effective 3/18/60, filed 3/23/60.]

WAC 296-08-530 Rules of evidence—Tentative admission—Exclusion—Discontinuance—Objections. When objection is made to the admissibility of evidence such evidence may be received subject to a later ruling. The officer conducting the hearing may, in his discretion, either with or without objection, exclude inadmissible evidence or order cumulative evidence discontinued. Parties objecting to the introduction of evidence shall state the precise grounds of such objection at the time such evidence is offered. [Rule .08.530, effective 3/18/60, filed 3/23/60.]

WAC 296-08-540 Petitions for rule making, amendment or repeal. Any interested person may petition the department or any division, board, commission or council thereof requesting the promulgation, amendment, or repeal of any rule. [Rule .08.540, effective 3/18/60, filed 3/23/60.]

WAC 296-08-550 Petitions for rule making, amendment or repeal—Requisites. Where the petition requests the promulgation of a rule, the requested or proposed rule must be set out in full, the petition must also include all the reasons for the requested rule together with briefs of any applicable law. Where the petition requests the amendment or repeal of a rule presently in effect, the rule or portion of the rule in question must be set out as well as a suggested amended form, if any. The petition must include all reasons for the requested amendment or repeal of the rule. [Rule .08.550, effective 3/18/60, filed 3/23/60.]

WAC 296-08-560 Petitions for rule making, amendment or repeal—Agency must consider. All petitions shall be considered by the department or the division, board, commission or council thereof and the department or the division, board, commission or council thereof may, in its discretion, order a hearing for the further consideration and discussion of the requested promulgation, amendment, repeal or modification of any rule. [Rule .08.560, effective 3/18/60, filed 3/23/60.]

WAC 296-08-570 Petitions for rule making, amendment or repeal—Notice of disposition. The department or the division, board, commission or council thereof shall notify the petitioning party within a reasonable time of the disposition, if any, of the petition. [Rule .08.570, effective 3/18/60, filed 3/23/60.]

WAC 296-08-580 Declaratory rulings. As prescribed by RCW 34.04.080, any interested person may petition the department or any division, board, commission or council thereof for a declaratory ruling. The department or the division, board, commission or council thereof shall consider the petition and within a reasonable time shall:

- (1) Issue a nonbinding declaratory ruling; or
- (2) Notify the person that no declaratory ruling is to be issued; or

(3) Set a reasonable time and place for a hearing or the submission of written evidence upon the matter, and give reasonable notification to the person of the time and place for such hearing or submission and of the issues involved.

If a hearing is held or evidence is submitted as provided in subsection (3), the department or the division, board, commission or council thereof shall within a reasonable time:

- (1) Issue a binding declaratory rule; or
- (2) Issue a nonbinding declaratory ruling; or
- (3) Notify the person that no declaratory ruling is to be issued. [Rule .08.580, effective 3/18/60, filed 3/23/60.]

WAC 296-08-590 Forms. (1) Any interested person petitioning the department or the division, board, commission or council thereof for a declaratory ruling pursuant to RCW 34.04.080, shall generally adhere to the following form for such purpose.

(a) At the top of the page shall appear the wording "Before the Department of Labor and Industries (name of appropriate Division Board, etc.)." On the left side of the page below the foregoing the following caption shall be set out: "In the matter of the petition of (name of petitioning party) for a declaratory ruling." Opposite the foregoing caption shall appear the word "Petition".

(b) The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party. The second paragraph shall state all rules or statutes that may be brought into issue by the petition. Succeeding paragraphs shall set out the state of facts relied upon in form similar to that applicable to complaints in civil actions before the superior courts of this state. The concluding paragraphs shall contain the prayer of the petitioner. The petition shall be subscribed and verified in the manner prescribed for verification of complaints in the superior courts of this state.

(c) The original and two legible copies shall be filed with the agency. Petitions shall be on white paper, either 8-1/2" x 11" or 8-1/2" x 13" in size.

(2) Any interested person petitioning the department or any division, board, commission or council thereof requesting the promulgation, amendment or repeal of any rules shall generally adhere to the following form for such purpose:

(a) At the top of the page shall appear the wording, "Before the Department of Labor and Industries (name of appropriate Division, Board, etc.)." On the left side of the page below the foregoing the following caption shall be set out: "In the matter of the petition of (name of petitioning party) for (state whether promulgation, amendment or repeal) of rule (or rules)." Opposite the foregoing shall appear the word "Petition."

(b) The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party and whether petitioner seeks the promulgation of new rule or rules, or amendment or repeal of existing rule or rules. The second paragraph, in case of a proposed new rule or amendment of an existing rule, shall set forth the desired

rule in its entirety. Where the petition is for amendment, the new matter shall be underscored and the matter proposed to be deleted shall appear in double parentheses. Where the petition is for repeal of an existing rule, such shall be stated and the rule proposed to be repealed shall either be set forth in full or shall be referred to by agency rule number. The third paragraph shall be set forth concisely the reasons for the proposal of the petitioner and shall contain a statement as to the interest of the petitioner in the subject matter of the rule. Additional numbered paragraphs may be used to give full explanation of petitioner's reason for the action sought.

(c) Petitions shall be dated and signed by the person or entity named in the first paragraph or by his attorney. The original and two legible copies of the petition shall be filed with the agency. Petitions shall be on white paper, either 8-1/2" x 11" or 8-1/2" x 13" in size. [Rule .08.590, effective 3/18/60, filed 3/23/60.]

Chapter 296-09 WAC

PRACTICE AND PROCEDURE—BOARD OF BOILER RULES

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WAC 296-09-010 Appearance and practice before agency—Who may appear. No person may appear in a representative capacity before the board of boiler rules or its designated hearing officer 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 our state law.

(3) Persons otherwise qualified as possessing the requisite skill to appear and expertly represent others who have applied to the board of boiler rules and have been duly authorized by the same to appear before it in a representative capacity.

(4) A bona fide officer, partner, or full time employee of an individual firm, association, partnership, or corporation. [Rule .08.010, effective 3/10/60, filed 3/23/60.]

WAC 296-09-020 Appearance and practice before agency—Appearance in certain proceedings may be limited to attorneys. In all hearings involving the taking of testimony and the formulation of a record subject to review by the courts, where the board of boiler rules or its designated hearing officer determine that representative activity in such hearing requires a high degree of legal training, experience, and skill, the board or its designated hearing officer may limit those who may appear in a representative capacity to attorneys at law. [Rule .08.020, effective 3/10/60, filed 3/23/60.]

WAC 296-09-030 Appearance and practice before agency—Solicitation of business unethical. It shall be unethical for persons acting in a representative capacity before the board of boiler rules to solicit business by circulars, advertisements or by personal relations, provided that such representatives may publish or circulate business cards. It is equally unethical to procure business indirectly by solicitors of any kind. [Rule .08.030, effective 3/10/60, filed 3/23/60.]

WAC 296-09-040 Appearance and practice before agency—Standards of ethical conduct. All persons appearing in proceedings before the board of boiler rules in 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 it. [Rule .08.040, effective 3/10/60, filed 3/23/60.]

WAC 296-09-050 Appearance and practice before agency—Appearance of former employee of board or former member of attorney general's staff. No former employee of the board of boiler rules 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 and in compliance with chapter 42.22 RCW, in a representative capacity on behalf of other parties in a formal proceeding wherein he previously took an active part as a representative of the board. [Rule .08.050, effective 3/10/60, filed 3/23/60.]

WAC 296-09-060 Appearance and practice before agency—Former employee as expert witness. No former employee of the board of boiler rules shall at any time after severing his employment with the board appear, except with the written permission and in compliance with chapter 42.22 RCW, as an expert witness on behalf of other parties in a formal proceeding wherein he previously took an active part in the investigation as a representative of the board. [Rule .08.060, effective 3/10/60, filed 3/23/60.]

WAC 296-09-070 Computation of time. In computing any period of time prescribed or allowed by the rules or by the order of the board of boiler rules 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, unless it is a Saturday, Sunday or a legal holiday, in which event the period runs until the end of the next day which is neither a Saturday, Sunday nor a holiday. When the period of time prescribed or allowed is less than seven days, intermediate Saturdays, Sundays and holidays shall be excluded in the computation. [Rule .08.070, effective 3/10/60, filed 3/23/60.]

WAC 296-09-080 Notice and opportunity for hearing in contested cases. In any contested case, all parties shall be served with a notice at least 10 days before the date set for the hearing, unless otherwise prescribed by law, or unless all interested parties waive such notice, and such waiver be noted in the minutes. The notice shall state the time, place, and issues involved, as required by RCW 34.04.090(1). [Rule .08.080, effective 3/10/60, filed 3/23/60.]

WAC 296-09-090 Service of process—By whom served. The board of boiler rules shall cause to be served all orders, notices and other papers issued by it, together with any other papers which it is required by law to serve. Every other paper shall be served by the party filing it. [Rule .08.090, effective 3/10/60, filed 3/23/60.]

WAC 296-09-100 Service of process—Upon whom served. All papers served by either the board of boiler rules or any party shall be served upon all counsel of record at the time [of] such filing and upon parties not represented by counsel or upon their agents designated by them by law. Any counsel entering an appearance subsequent to the initiation of the proceeding shall notify all other counsel then of record and all parties not represented by counsel of such fact. [Rule .08.100, effective 3/10/60, filed 3/23/60.]

WAC 296-09-110 Service of process—Service upon parties. The final order, and any other paper required to be served by the agency upon a party, shall be served upon such party or upon the agent designated by him or by law to receive service of such papers, and a copy shall be furnished to counsel of record. [Rule .08.110, effective 3/10/60, filed 3/23/60.]

WAC 296-09-120 Service of process—Method of service. Service of papers shall be made personally or, unless otherwise provided by law, by first-class, or registered, or certified mail; or by telegraph. [Rule .08.120, effective 3/10/60, filed 3/23/60.]

WAC 296-09-130 Service of process—When service complete. Service upon parties shall be regarded as complete: By mail, upon deposit in the United States mail properly stamped and addressed; by telegraph, when deposited with a telegraph company properly addressed and with charges prepaid. [Rule .08.130, effective 3/10/60, filed 3/23/60.]

WAC 296-09-140 Service of process—Filing with agency. Papers required to be filed with the board of boiler rules shall be deemed filed upon actual receipt by the board at the place specified in its rules accompanied by proof of service upon parties required to be served. [Rule .08.140, effective 3/10/60, filed 3/23/60.]

WAC 296-09-370 Official notice—Matters of law. The board of boiler rules or its hearing officer upon request made before or during a hearing, will officially notice: (1) **Federal law.** The constitution; congressional acts, resolutions, records, journals and committee reports; decisions of federal courts and administrative agencies; executive orders and proclamations; and all rules, orders and notices published in the Federal Register.

(2) **State law.** The constitution of the state of Washington, acts of the legislature, resolutions, records, journals and committee reports; decisions of administrative agencies of the state of Washington, executive orders and proclamations by the governor; and all rules, orders and notices filed with the code reviser.

(3) **Governmental organization.** Organization, territorial limitations, officers, departments, and general administration of the government of the state of Washington, the United States, the several states and foreign nations.

(4) **Agency organization.** The board of boiler rules' organization, administration, officers, personnel, official

publications, and practitioners before its bar. [Rule .08.370, effective 3/10/60, filed 3/23/60.]

WAC 296-09-380 Official notice—Material facts. In the absence of controverting evidence, the board of boiler rules and its hearing officers, upon request made before or during a hearing, may officially notice: (1) **Agency proceedings.** The pendency of, the issue and position of the parties therein, and the disposition of any proceeding then pending before or theretofore concluded by the board of boiler rules;

(2) **Business customs.** General customs and practices followed in the transaction of business;

(3) **Notorious facts.** Facts so generally and widely known to all well-informed persons as not to be subject to reasonable dispute, or specific facts which are capable of immediate and accurate demonstration by resort to accessible sources of generally accepted authority, including but not exclusively, facts stated in any publication authorized or permitted by law to be made by any federal or state officer, department, or agency;

(4) **Technical knowledge.** Matters within the technical knowledge of the board of boiler rules as a body of experts, within the scope or pertaining to the subject matter of its statutory duties, responsibilities or jurisdiction;

(5) **Request or suggestion.** Any party may request, or the hearing officer or the board of boiler rules may suggest, that official notice be taken of a material fact, which shall be clearly and precisely stated, orally on the record, at any pre-hearing conference or oral hearing or argument, or may make such request or suggestion by written notice, any pleading, motion, memorandum, or brief served upon all parties, at any time prior to a final decision;

(6) **Statement.** Where an initial or final decision of the board of boiler rules rests in whole or in part upon official notice of a material fact, such fact shall be clearly and precisely stated in such decision. In determining whether to take official notice of material facts, the hearing officer of the board may consult any source of pertinent information, whether or not furnished as it may be, by any party and whether or not admissible under the rules of evidence;

(7) **Controversion.** Any party may controvert a request or a suggestion that official notice of a material fact be taken at the time the same is made if it be made orally, or by a pleading, reply or brief in response to the pleading or brief or notice in which the same is made or suggested. If any decision is stated to rest in whole or in part upon official notice of a material fact which the parties have not had a prior opportunity to controvert, any party may controvert such fact by appropriate exceptions if such notice be taken in an initial or intermediate decision or by a petition for reconsideration if notice of such fact be taken in a final report. Such controversion shall concisely and clearly set forth the sources, authority and other data relied upon to show the existence or nonexistence of the material fact assumed or denied in the decision;

(8) **Evaluation of evidence.** Nothing herein shall be construed to preclude the board of boiler rules or its authorized agents from utilizing their experience, technical

competence, and specialized knowledge in the evaluation of the evidence presented to them. [Rule .08.380, effective 3/10/60, filed 3/23/60.]

WAC 296-09-390 Presumptions. Upon proof of the predicate facts specified in the following six subdivisions hereof without substantial dispute and by direct, clear, and convincing evidence, the board of boiler rules with or without prior request or notice, may take the following presumptions, where consistent with all surrounding facts and circumstances:

(1) **Continuity.** That a fact of a continuous nature, provided to exist at a particular time, continues to exist as of the date of the presumption, if the fact is one which usually exists for at least that period of time;

(2) **Identity.** That persons and objects of the same name and description are identical;

(3) **Delivery.** Except in a proceeding where the liability of the carrier for nondelivery is involved, that mail matter, communications, express or freight, properly addressed, marked, billed and delivered respectively to the post office, telegraph, cable or radio company, or authorized common carrier of property with all postage, tolls and charges properly prepaid, is or has been delivered to the addressee or consignee in the ordinary course of business;

(4) **Ordinary course.** That a fact exists or does not exist, upon proof of the existence or nonexistence of another fact which in the ordinary and usual course of affairs, usually and regularly co-exists with the fact presumed;

(5) **Acceptance of benefit.** That a person for whom an act is done or to whom a transfer is made has, does or will accept same where it is clearly in his own self-interest so to do,

(6) **Interference with remedy.** That evidence, with respect to a material fact which in bad faith is destroyed, eloiigned, suppressed or withheld by a party in control thereof, would if produced, corroborate the evidence of the adversary party with respect to such fact. [Rule .08.390, effective 3/10/60, filed 3/23/60.]

WAC 296-09-400 Stipulations and admissions of record. The existence or nonexistence of a material fact, as made or agreed in a stipulation or in an admission of record, will be conclusively presumed against any party bound thereby, and no other evidence with respect thereto will be received upon behalf of such party, provided: (1) **Upon whom binding.** Such a stipulation or admission is binding upon the parties by whom it is made, their privies and upon all other parties to the proceeding who do not expressly and unequivocally deny the existence or nonexistence of the material fact so admitted or stipulated, upon the making thereof, if made on the record at a pre-hearing conference, oral hearing, oral argument or by a writing filed and served upon all parties within five days after a copy of such stipulation or admission has been served upon them;

(2) **Withdrawal.** Any party bound by a stipulation or admission or record at any time prior to final decision may be permitted to withdraw the same in whole or in part by showing to the satisfaction of the hearing officer

or the board of boiler rules that such stipulation or admission was made inadvertently or under a bona fide mistake of fact contrary to the true fact and that its withdrawal at the time proposed will not unjustly prejudice the rights of other parties to the proceeding. [Rule .08.400, effective 3/10/60, filed 3/23/60.]

WAC 296-09-410 Form and content of decisions in contested cases. Every decision and order, whether proposed, initial, or final, shall: (1) Be correctly captioned as to name of agency and name of proceeding;

(2) Designate all parties and counsel to the proceeding.

(3) Include a concise statement of the nature and background of the proceeding;

(4) Be accompanied by appropriate numbered findings of fact and conclusions of law;

(5) Whenever practical, include the reason or reasons for the particular order or remedy afforded;

(6) Whenever practical, be referenced to specific provisions of the law and/or regulations appropriate thereto, together with reasons and precedents relied upon to support the same. [Rule .08.410, effective 3/10/60, filed 3/23/60.]

WAC 296-09-420 Definition of issues before hearing. In all proceedings the issues to be adjudicated shall be made initially as precise as possible, in order that hearing officers may proceed promptly to conduct the hearings on relevant and material matter only. [Rule .08.420, effective 3/10/60, filed 3/23/60.]

WAC 296-09-430 Prehearing conference rule—Authorized. In any proceeding the board of boiler rules or its designated hearing officer upon its or his own motion, or upon the motion of one of the parties or their qualified representatives, may in its or his discretion direct the parties or their qualified representatives to appear at a specified time and place for a conference to consider

(1) The simplification of the issues;

(2) The necessity of amendments to the pleadings;

(3) The possibility of obtaining stipulations, admissions of facts and of documents;

(4) The limitation of the number of expert witnesses;

(5) Such other matters as may aid in the disposition of the proceeding. [Rule .08.430, effective 3/10/63, filed 3/23/60.]

WAC 296-09-440 Prehearing conference rule—Record of conference action. The board of boiler rules or its designated hearing officer shall make an order or statement which recites the action taken at the conference, the amendments allowed to the pleadings and the agreements made by the parties or their qualified representatives as to any of the matters considered, including the settlement or simplification of issues, and which limits the issues for hearing to those not disposed of by admissions or agreements; and such order or statement shall control the subsequent course of the proceeding unless modified for good cause by subsequent order. [Rule .08.440, effective 3/10/60, filed 3/23/60.]

WAC 296-09-450 Submission of documentary evidence in advance. Where practical the board of boiler rules or its designated hearing officer may require: (1) That all documentary evidence which is to be offered during the taking of evidence be submitted to the hearing examiner and to the other parties to the proceeding sufficiently in advance of such taking of evidence to permit study and preparation of cross-examination and rebuttal evidence.

(2) That documentary evidence not submitted in advance, as may be required by subsection (1), be not received in evidence in the absence of a clear showing that the offering party had good cause for his failure to produce the evidence sooner;

(3) That the authenticity of all documents submitted in advance in a proceeding in which such submission is required, be deemed admitted unless written objection thereto is filed prior to the hearing, except that a party will be permitted to challenge such authenticity at a later time upon a clear showing of good cause for failure to have filed such written objection. [Rule .08.450, effective 3/10/60, filed 3/23/60.]

WAC 296-09-460 Excerpts from documentary evidence. When portions only of a document are to be relied upon, the offering party shall prepare the pertinent excerpts, adequately identified, and shall supply copies of such excerpts, together with a statement indicating the purpose for which such materials will be offered, to the hearing examiner and to other parties. Only the excerpts, so prepared and submitted, shall be received in the record. However, the whole of the original document shall be made available for examination and for use by all parties to the proceeding. [Rule .08.460, effective 3/10/60, filed 3/23/60.]

WAC 296-09-470 Expert or opinion testimony and testimony based on economic or statistical data—Number and qualifications of witnesses. That the hearing examiner or other appropriate officer in all classes of cases where practicable make an effort to have the interested parties agree upon the witness or witnesses who are to give expert or opinion testimony, either by selecting one or more to speak for all parties or by limiting the number for each party; and, if the interested parties cannot agree, require them to submit to him [and] to the other parties written statements containing the names, addresses and qualifications of their respective opinion or expert witnesses, by a date determined by him and fixed sufficiently in advance of the hearing to permit the other interested parties to investigate such qualifications. [Rule .08.470, effective 3/10/60, filed 3/23/60.]

WAC 296-09-480 Expert or opinion testimony and testimony based on economic or statistical data—Written sworn statements. That the hearing examiner or other appropriate officer, in all classes of cases in which it is practicable and permissible, require, and when not so permissible, make every effort to bring about by voluntary submission, that all direct opinion or expert testimony and all direct testimony based on economic or statistical data be reduced to written sworn statements,

and, together with the exhibits upon which based, be submitted to him and to the other parties to the proceeding by a date determined by the hearing officer and fixed a reasonable time in advance of the hearing; and that such sworn statements be acceptable as evidence upon formal offer at the hearing, subject to objection on any ground except that such sworn statements shall not be subject to challenge because the testimony is not presented orally, and provided that witnesses making such statements shall not be subject to cross-examination unless a request is made sufficiently in advance of the hearing to insure the presence of the witnesses. [Rule .08.480, effective 3/10/60, filed 3/23/60.]

WAC 296-09-490 Expert or opinion testimony and testimony based on economic or statistical data—Supporting data. That the hearing examiner or other appropriate officer, in his discretion but consistent with the rights of the parties, cause the parties to make available for inspection in advance of the hearing, and for purposes of cross-examination at the hearing, the data underlying statements and exhibits submitted in accordance with WAC 296-09-480, but, wherever practicable that he restrict to a minimum the placing of such data in the record. [Rule .08.490, effective 3/10/60, filed 3/23/60.]

WAC 296-09-500 Expert or opinion testimony and testimony based on economic or statistical data—Effect of noncompliance with WAC 296-09-470 or 296-09-480. Whenever the manner of introduction of opinion or expert testimony or testimony based on economic or statistical data is governed by requirements fixed under the provisions of WAC 296-09-470 or 296-09-480, such testimony not submitted in accordance with the relevant requirements shall not be received in evidence in the absence of a clear showing that the offering party had good cause for his failure to conform to such requirements. [Rule .08.500, effective 3/10/60, filed 3/23/60.]

WAC 296-09-510 Continuances. Any party who desires a continuance shall, immediately upon receipt of notice of hearing, or as soon thereafter as requiring such continuance come to his knowledge, notify the board of boiler rules or its designated hearing officer of said desire, stating in detail the reasons why such continuance is necessary. The board or its designated hearing officer, in passing upon a request for continuance, shall consider whether such request was promptly and timely made. For good cause shown the board or its designated hearing officer may grant such a continuance and may at any time order a continuance upon its or his own motion. During a hearing, if it appears in the public interest or in the interest of justice that further testimony or argument should be received, the examiner or other officer conducting the hearing may in his discretion continue the hearing and fix a date for introduction of additional evidence or presentation of argument. Such oral notice shall constitute final notice of such continued hearing. [Rule .08.510, effective 3/10/60, filed 3/23/60.]

WAC 296-09-520 Rules of evidence—Admissibility criteria. Subject to the other provisions of these rules, all relevant evidence is admissible which, in the opinion of the officer conducting the hearing, is the best evidence reasonably obtainable, having due regard for its necessity, availability and trustworthiness. In passing upon the admissibility of evidence, the officer conducting the hearing shall give consideration to, but shall not be bound to follow, the rules of evidence governing civil proceedings in matters not involving trial by jury, in the superior court of the state of Washington. [Rule .08.520, effective 3/10/60, filed 3/23/60.]

WAC 296-09-530 Rules of evidence—Tentative admission—Exclusion—Discontinuance—Objections. When objection is made to the admissibility of evidence such evidence may be received subject to a later ruling. The officer conducting the hearing may, in his discretion, either with or without objection, exclude inadmissible evidence or order cumulative evidence discontinued. Parties objecting to the introduction of evidence shall state the precise grounds of such objection at the time such evidence is offered. [Rule .08.530, effective 3/10/60, filed 3/23/60.]

WAC 296-09-540 Petitions for rule making, amendment or repeal—Who may petition. Any interested person may petition the board of boiler rules requesting the promulgation, amendment, or repeal of any rule. [Rule .08.540, effective 3/10/60, filed 3/23/60.]

WAC 296-09-550 Petitions for rule making, amendment or repeal—Requisites. Where the petition requests the promulgation of a rule, the requested or proposed rule must be set out in full, the petition must also include all the reasons for the requested rule together with briefs of any applicable law. Where the petition requests the amendment or repeal of a rule presently in effect, the rule or portion of the rule in question must be set out as well as a suggested amended form, if any. The petition must include all reasons for the requested amendment or repeal of the rule. [Rule .08.550, effective 3/10/60, filed 3/23/60.]

WAC 296-09-560 Petitions for rule making, amendment or repeal—Agency must consider. All petitions shall be considered by the board of boiler rules and the board may, in its discretion, order a hearing for the further consideration and discussion of the requested promulgation, amendment, repeal or modification of any rule. [Rule .08.560, effective 3/10/60, filed 3/23/60.]

WAC 296-09-570 Petitions for rule making, amendment or repeal—Notice of disposition. The board of boiler rules shall notify the petitioning party within a reasonable time of the disposition, if any, of the petition. [Rule .08.570, effective 3/10/60, filed 3/23/60.]

WAC 296-09-580 Declaratory rulings. (1) As prescribed by RCW 34.04.080, any interested person may

petition the board of boiler rules for a declaratory ruling. The board shall consider the petition and within a reasonable time shall:

- (a) Issue a nonbinding declaratory ruling; or
- (b) Notify the person that no declaratory ruling is to be issued; or
- (c) Set a reasonable time and place for a hearing or the submission of written evidence upon the matter, and give reasonable notification to the person of the time and place for such hearing or submission and of the issues involved.

(2) If a hearing is held or evidence is submitted as provided in subsection (c), the department or the board shall within a reasonable time:

- (a) Issue a binding declaratory rule; or
- (b) Issue a nonbinding declaratory ruling; or
- (c) Notify the person that no declaratory ruling is to be issued. [Rule .08.580, effective 3/10/60, filed 3/23/60.]

WAC 296-09-590 Forms. (1) Any interested person petitioning the board of boiler rules thereof for a declaratory ruling pursuant to RCW 34.04.080, shall generally adhere to the following form for such purpose.

At the top of the page shall appear the wording "Before the Board of Boiler Rules." on the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for a Declaratory Ruling." Opposite the foregoing caption shall appear the word "Petition."

The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party. The second paragraph shall state all rules or statutes that may be brought into issue by the petition. Succeeding paragraphs shall set out the state of facts relied upon in form similar to that applicable to complaints in civil actions before the superior courts of this state. The concluding paragraphs shall contain the prayer of the petitioner. The petition shall be subscribed and verified in the manner prescribed for verification of complaints in the superior courts of this state.

The original and two legible copies shall be filed with the agency. Petitions shall be on white paper, either 8 1/2" x 11" or 8 1/2" x 13" in size.

(2) Any interested person petitioning the board of boiler rules thereof requesting the promulgation, amendment or repeal of any rules shall generally adhere to the following form for such purpose.

At the top of the page shall appear the wording, "Before the Board of Boiler Rules." On the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for (state whether promulgation, amendment or repeal) of Rule (or Rules)." Opposite the foregoing caption shall appear the word "Petition."

The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party and whether petitioner seeks the promulgation of new rule or rules, or amendment or repeal of existing rule or rules. The second paragraph, in case of a proposed new rule or

amendment of an existing rule, shall set forth the desired rule in its entirety. Where the petition is for amendment, the new matter shall be underscored and the matter proposed to be deleted shall appear in double parentheses. Where the petition is for repeal of an existing rule, such shall be stated and the rule proposed to be repealed shall either be set forth in full or shall be referred to by agency rule number. The third paragraph shall set forth concisely the reasons for the proposal of the petitioner and shall contain a statement as to the interest of the petitioner in the subject matter of the rule. Additional numbered paragraphs may be used to give full explanation of petitioner's reason for the action sought.

Petitions shall be dated and signed by the person or entity named in the first paragraph or by his attorney. The original and two legible copies of the petition shall be filed with the agency. Petitions shall be on white paper, either 8 1/2" x 11" or 8 1/2" x 13" in size. [Rule .08.590, effective 3/10/60, filed 3/23/60.]

Chapter 296-10 WAC

PRACTICE AND PROCEDURE—INDUSTRIAL WELFARE COMMITTEE

WAC

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WAC 296-10-010 Appearance and practice before agency—Who may appear. No person may appear in a representative capacity before the industrial welfare committee or its designated hearing officer 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 our state law.

(3) Persons otherwise qualified as possessing the requisite skill to appear and expertly represent others who have been duly authorized by the same to appear before it in a representative capacity.

(4) A bona fide officer, partner, or full time employee of an individual firm, association, partnership, or corporation. [Rule .08.010, effective 3/18/60, filed 3/23/60.]

WAC 296-10-020 Appearance and practice before agency—Appearance in certain proceedings may be limited to attorneys. In all hearings involving the taking of testimony and the formulation of a record subject to review by the courts, where the industrial welfare committee or its designated hearing officer determine that representative activity in such hearing requires a high degree of legal training, experience, and skill, the committee or its designated hearing officer may limit those who may appear in a representative capacity to attorneys at law. [Rule .08.020, effective 3/18/60, filed 3/23/60.]

WAC 296-10-030 Appearance and practice before agency—Solicitation of business unethical. It shall be unethical for persons acting in a representative capacity

before the industrial welfare committee to solicit business by circulars, advertisements or by personal relations, provided that such representatives may publish or circulate business cards. It is equally unethical to procure business indirectly by solicitors of any kind. [Rule .08.030, effective 3/18/60, filed 3/23/60.]

WAC 296-10-040 Appearance and practice before agency—Standards of ethical conduct. All persons appearing in proceedings before the industrial welfare committee in 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] committee may decline to permit such person to appear in a representative capacity in any proceeding before it. [Rule .08.040, effective 3/18/60, filed 3/23/60.]

WAC 296-10-050 Appearance and practice before agency—Appearance of former employee of board or former member of attorney general's staff. No former employee of the industrial welfare committee or member of the attorney general's staff may at any time after severing his employment with the committee or the attorney general appear, except with the written permission and in compliance with chapter 42.22 RCW, in a representative capacity on behalf of other parties in a formal proceeding wherein he previously took an active part as a representative of the committee. [Rule .08.050, effective 3/18/60, filed 3/23/60.]

WAC 296-10-060 Appearance and practice before agency—Former employee as expert witness. No former employee of the industrial welfare committee shall at any time after severing his employment with the committee appear, except with the written permission and in compliance with chapter 42.22 RCW, as an expert witness on behalf of other parties in a formal proceeding wherein he previously took an active part in the investigation as a representative of the committee. [Rule .08.060, effective 3/18/60, filed 3/23/60.]

WAC 296-10-070 Computation of time. In computing any period of time prescribed or allowed by the rules or by the order of the industrial welfare committee 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, unless it is a Saturday, Sunday or a legal holiday, in which event the period runs until the end of the next day which is neither a Saturday, Sunday nor a holiday. When the period of time prescribed or allowed is less than seven days, intermediate Saturdays, Sundays and holidays shall be excluded in the computation. [Rule .08.070, effective 3/18/60, filed 3/23/60.]

WAC 296-10-080 Notice and opportunity for hearing in contested cases. In any contested case, all parties shall be served with a notice at least 10 days before the date set for the hearing, unless otherwise prescribed by law, or unless all interested parties waive such notice in

writing. The notice shall state the time, place, and issues involved, as required by RCW 34.04.090(1). [Rule .08.080, effective 3/18/60, filed 3/23/60.]

WAC 296-10-090 Notice and opportunity for hearing in contested cases—By whom served. The industrial welfare committee shall cause to be served all orders, notices and other papers issued by it, together with any other papers which it is required by law to serve. Every other paper shall be served by the party filing it. [Rule .08.090, effective 3/18/60, filed 3/23/60.]

WAC 296-10-100 Notice and opportunity for hearing in contested cases—Upon whom served. All papers served by either the industrial welfare committee or any party shall be served upon all counsel of record at the time such filing and upon parties not represented by counsel or upon their agents designated by them by law. Any counsel entering an appearance subsequent to the initiation of the proceeding shall notify all other counsel then of record and all parties not represented by counsel of such fact. [Rule .08.100, effective 3/18/60, filed 3/23/60.]

WAC 296-10-110 Notice and opportunity for hearing in contested cases—Service upon parties. The final order, and any other paper required to be served by the agency upon a party, shall be served upon such party or upon the agent designated by him or by law to receive service of such papers, and a copy shall be furnished to counsel of record. [Rule .08.110, effective 3/18/60, filed 3/23/60.]

WAC 296-10-120 Notice and opportunity for hearing in contested cases—Method of service. Service of papers shall be made personally or, unless otherwise provided by law, by first-class, or registered, or certified mail; or by telegraph. [Rule .08.120, effective 3/18/60, filed 3/23/60.]

WAC 296-10-130 Notice and opportunity for hearing in contested cases—When service complete. Service upon parties shall be regarded as complete: By mail, upon deposit in the United States mail properly stamped and addressed; by telegraph, when deposited with a telegraph company properly addressed and with charges prepaid. [Rule .08.130, effective 3/18/60, filed 3/23/60.]

WAC 296-10-140 Notice and opportunity for hearing in contested cases—Filing with agency. Papers required to be filed with the industrial welfare committee shall be deemed filed upon actual receipt by the committee at the place specified in its rules accompanied by proof of service upon parties required to be served. [Rule .08.140, effective 3/18/60, filed 3/23/60.]

WAC 296-10-150 Subpoenas—Where provided by law—Form. Every subpoena, where authorized by law, shall state "Industrial Welfare Committee, State of Washington" and the title of the proceeding, if any, and shall command the person to whom it is directed to attend and give testimony or produce designated books,

documents or things under his control at a specified time and place. [Rule .08.150, effective 3/18/60, filed 3/23/60.]

WAC 296-10-160 Subpoenas—Issuance to parties. Upon application of counsel or other representative authorized to practice before the agency for any party to a contested case, there shall be issued to such party subpoenas requiring the attendance and testimony of witnesses or the production of evidence in such proceeding. Where authorized by law, the industrial welfare committee may issue subpoenas to parties not so represented upon a request or showing of general relevance and reasonable scope of the testimony or evidence sought. [Rule .08.160, effective 3/18/60, filed 3/23/60.]

WAC 296-10-170 Subpoenas—Service. Unless the service of a subpoena is acknowledged on its face by the person subpoenaed, service shall be made by delivering a copy of the subpoena to such person and by tendering him on demand, if entitled to make such demand, the fees for one day's attendance and the mileage allowed by law. [Rule .08.170, effective 3/18/60, filed 3/23/60.]

WAC 296-10-180 Subpoenas—Fees. Witnesses summoned before the industrial welfare committee shall be paid by the party at whose instance they appear the same fees and mileage that are paid to witnesses in the superior courts of the state of Washington. [Rule .08.180, effective 3/18/60, filed 3/23/60.]

WAC 296-10-190 Subpoenas—Proof of service. The person serving the subpoena shall make proof of service by filing the subpoena and the required return, affidavit or acknowledgment of service with the industrial welfare committee or the officer before whom the witness is required to testify or produce evidence. If service is made by a person other than an officer of the committee and such service has not been acknowledged by the witness, such person shall make an affidavit of service. Failure to make proof of service does not affect the validity of the service. [Rule .08.190, effective 3/18/60, filed 3/23/60.]

WAC 296-10-200 Subpoenas—Quashing. Upon motion made promptly, and in any event at or before the time specified in the subpoena for compliance, by the person to whom the subpoena is directed (and upon notice to the party to whom the subpoena was issued) the industrial welfare committee or its authorized member or officer may (1) quash or modify the subpoena if it is unreasonable or requires evidence not relevant to any matter in issue, or (2) condition denial of the motion upon just and reasonable conditions. [Rule .08.200, effective 3/18/60, filed 3/23/60.]

WAC 296-10-210 Subpoenas—Enforcement. Upon application and for good cause shown, the industrial welfare committee will seek judicial enforcement of subpoenas, where authorized by law, issued to parties

and which have not been quashed. [Rule .08.210, effective 3/18/60, filed 3/23/60.]

WAC 296-10-220 Subpoenas—Geographical scope. Such attendance of witnesses and such production of evidence may be required from any place in the state of Washington, at any designated place of hearing. [Rule .08.220, effective 3/18/60, filed 3/23/60.]

WAC 296-10-370 Official notice—Matters of law. The industrial welfare committee or its hearing officer upon request made before or during a hearing, will officially notice: (1) **Federal law.** The constitution; congressional acts, resolutions, records, journals and committee reports; decisions of federal courts and administrative agencies; executive orders and proclamations; and all rules, orders and notices published in the Federal Register;

(2) **State law.** The constitution of the state of Washington, acts of the legislature, resolutions, records, journals and committee reports; decisions of administrative agencies of the state of Washington, executive orders and proclamations by the governor; and all rules, orders and notices filed with the code reviser;

(3) **Governmental organization.** Organization, territorial limitations, officers, departments, and general administration of the government of the state of Washington, the United States, the several states and foreign nations;

(4) **Agency organization.** The industrial welfare committee's organization, administration, officers, personnel, official publications, and practitioners before its bar. [Rule .08.370, effective 3/18/60, filed 3/23/60.]

WAC 296-10-380 Official notice—Material facts. In the absence of controverting evidence, the industrial welfare committee and its hearing officers, upon request made before or during a hearing, may officially notice: (1) **Agency proceedings.** The pendency of, the issue and position of the parties therein, and the disposition of any proceeding then pending before or theretofore concluded by the industrial welfare committee;

(2) **Business customs.** General customs and practices followed in the transaction of business;

(3) **Notorious facts.** Facts so generally and widely known to all well-informed persons as not to be subject to reasonable dispute, or specific facts which are capable of immediate and accurate demonstration by resort to accessible sources of generally accepted authority, including but not exclusively, facts stated in any publication authorized or permitted by law to be made by any federal or state officer, department, or agency;

(4) **Technical knowledge.** Matters within the technical knowledge of the industrial welfare committee as a body of experts, within the scope or pertaining to the subject matter of its statutory duties, responsibilities or jurisdiction;

(5) **Request or suggestion.** Any party may request, or the hearing officer or the industrial welfare committee may suggest, that official notice be taken of a material fact, which shall be clearly and precisely stated, orally

on the record, at any prehearing conference or oral hearing or argument, or may make such request or suggestion by written notice, any pleading, motion, memorandum or brief served upon all parties, at any time prior to a final decision;

(6) **Statement.** Where an initial or final decision of the industrial welfare committee rests in whole or in part upon official notice of a material fact, such fact shall be clearly and precisely stated in such decision. In determining whether to take official notice of material facts, the hearing officer of the committee may consult any source of pertinent information, whether or not furnished as it may be, by any party and whether or not admissible under the rules of evidence;

(7) **Controversion.** Any party may controvert a request or a suggestion that official notice of a material fact be taken at the time the same is made if it be made orally, or by a pleading, reply or brief in response to the pleading or brief or notice in which the same is made or suggested. If any decision is stated to rest in whole or in part upon official notice of a material fact which the parties have not had a prior opportunity to controvert, any party may controvert such fact by appropriate exceptions if such notice be taken in an initial or intermediate decision or by a petition for reconsideration if notice of such fact be taken in a final report. Such controversion shall concisely and clearly set forth the sources, authority and other data relied upon to show the existence or nonexistence of the material fact assumed or denied in the decision;

(8) **Evaluation of evidence.** Nothing herein shall be construed to preclude the industrial welfare committee its authorized agents from utilizing their experience, technical competence, and specialized knowledge in the evaluation of the evidence presented to them. [Rule .08.380, effective 3/18/60, filed 3/23/60.]

WAC 296-10-390 Presumptions. Upon proof of the predicate facts specified in the following six subsections hereof without substantial dispute and by direct, clear, and convincing evidence, the industrial welfare committee with or without prior request or notice, may make the following presumptions, where consistent with all surrounding facts and circumstances: (1) **Continuity.** That a fact of a continuous nature, provided to exist at a particular time, continues to exist as of the date of the presumption, if the fact is one which usually exists for at least that period of time;

(2) **Identity.** That persons and objects of the same name and description are identical;

(3) **Delivery.** Except in a proceeding where the liability of the carrier for non-delivery is involved, that mail matter, communications, express or freight, properly addressed, marked, billed and delivered respectively to the post office, telegraph, cable or radio company, or authorized common carrier of property with all postage, tolls and charges properly prepaid, is or has been delivered to the addressee or consignee in the ordinary course of business;

(4) **Ordinary course.** That a fact exists or does not exist, upon proof of the existence or non-existence of another fact which in the ordinary and usual course of

affairs, usually and regularly co-exists with the fact presumed;

(5) **Acceptance of benefit.** That a person for whom an act is done or to whom a transfer is made has, does or will accept same where it is clearly in his own self-interest so to do;

(6) **Interference with remedy.** That evidence, with respect to a material fact which in bad faith is destroyed, eloiigned, suppressed or withheld by a party in control thereof, would if produced, corroborate the evidence of the adversary party with respect to such fact. [Rule .08.390, effective 3/18/60, filed 3/23/60.]

WAC 296-10-400 Stipulations and admissions of record. The existence or nonexistence of a material fact, as made or agreed in a stipulation or in an admission of record, will be conclusively presumed against any party bound thereby, and no other evidence with respect thereto will be received upon behalf of such party, provided: (1) **Upon whom binding.** Such a stipulation or admission is binding upon the parties by whom it is made, their privies and upon all other parties to the proceeding who do not expressly and unequivocally deny the existence or nonexistence of the material fact so admitted or stipulated, upon the making thereof, if made on the record at a prehearing conference, oral hearing, oral argument or by a writing filed and served upon all parties within five days after a copy of such stipulation or admission has been served upon them;

(2) **Withdrawal.** Any party bound by a stipulation or admission or record at any time prior to final decision may be permitted to withdraw the same in whole or in part by showing to the satisfaction of the hearing officer or the industrial welfare committee that such stipulation or admission was made inadvertently or under a bona fide mistake of fact contrary to the true fact and that its withdrawal at the time proposed will not unjustly prejudice the rights of other parties to the proceeding. [Rule .08.400, effective 3/18/60, filed 3/23/60.]

WAC 296-10-410 Form and content of decisions in contested cases. Every decision and order, whether proposed, initial, or final, shall: (1) Be correctly captioned as to name of agency and name of proceeding;

(2) Designate all parties and counsel to the proceeding;

(3) Include a concise statement of the nature and background of the proceeding;

(4) Be accompanied by appropriate numbered findings of fact and conclusions of law;

(5) Whenever practical, include the reason or reasons for the particular order or remedy afforded;

(6) Wherever practical, be referenced to specific provisions of the law and/or regulations appropriate thereto, together with reasons and precedents relied upon to support the same. [Rule .08.410, effective 3/18/60, filed 3/23/60.]

WAC 296-10-420 Definition of issues before hearing. In all proceedings the issues to be adjudicated shall be made initially as precise as possible, in order that hearing officers may proceed promptly to conduct the

hearings on relevant and material matter only. [Rule .08.420, effective 3/18/60, filed 3/23/60.]

WAC 296-10-430 Prehearing conference rule—Authorized. In any proceeding the industrial welfare committee or its designated hearing officer upon its or his own motion, or upon the motion of one of the parties or their qualified representatives, may in its or his discretion direct the parties or their qualified representatives to appear at a specified time and place for a conference to consider

- (1) The simplification of the issues;
- (2) The necessity of amendments to the pleadings;
- (3) The possibility of obtaining stipulations, admissions of facts and of documents;
- (4) The limitation of the number of expert witnesses;
- (5) Such other matters as may aid in the disposition of the proceeding. [Rule .08.430, effective 3/18/60, filed 3/23/60.]

WAC 296-10-440 Prehearing conference rule—Record of conference action. The industrial welfare committee or its designated hearing officer shall make an order or statement which recites the action taken at the conference, the amendments allowed to the pleadings and the agreements made by the parties or their qualified representatives as to any of the matters considered, including the settlement or simplification of issues, and which limits the issues for hearing to those not disposed of by admissions or agreements; and such order or statement shall control the subsequent course of the proceeding unless modified for good cause by subsequent order. [Rule .08.440, effective 3/18/60, filed 3/23/60.]

WAC 296-10-450 Submission of documentary evidence in advance. Where practical the industrial welfare committee or its designated hearing officer may require:

- (1) That all documentary evidence which is to be offered during the taking of evidence be submitted to the hearing examiner and to the other parties to the proceeding sufficiently in advance of such taking of evidence to permit study and preparation of cross-examination and rebuttal evidence.

- (2) That documentary evidence not submitted in advance, as may be required by subsection (1), be not received in evidence in the absence of a clear showing that the offering party had good cause for his failure to produce the evidence sooner;

- (3) That the authenticity of all documents submitted in advance in a proceeding in which such submission is required, be deemed admitted unless written objection thereto is filed prior to the hearing, except that a party will be permitted to challenge such authenticity at a later time upon a clear showing of good cause for failure to have filed such written objection. [Rule .08.450, effective 3/18/60, filed 3/23/60.]

WAC 296-10-460 Excerpts from documentary evidence. When portions only of a document are to be relied upon, the offering party shall prepare the pertinent excerpts, adequately identified, and shall supply copies

of such excerpts, together with a statement indicating the purpose for which such materials will be offered, to the hearing examiner and to other parties. Only the excerpts, so prepared and submitted, shall be received in the record. However, the whole of the original document shall be made available for examination and for use by all parties to the proceeding. [Rule .08.460, effective 3/18/60, filed 3/23/60.]

WAC 296-10-470 Expert or opinion testimony and testimony based on economic or statistical data—Number and qualifications of witnesses. That the hearing examiner or other appropriate officer in all classes of cases where practicable make an effort to have the interested parties agree upon the witness or witnesses who are to give expert or opinion testimony, either by selecting one or more to speak for all parties or by limiting the number for each party; and, if the interested parties cannot agree, require them to submit to him to the other parties written statements containing the names, addresses and qualifications of their respective opinion or expert witnesses, by a date determined by him and fixed sufficiently in advance of the hearing to permit the other interested parties to investigate such qualifications. [Rule .08.470, effective 3/18/60, filed 3/23/60.]

WAC 296-10-480 Expert or opinion testimony and testimony based on economic or statistical data—Written sworn statements. That the hearing examiner or other appropriate officer, in all classes of cases in which it is practicable and permissible, require, and when not so permissible, make every effort to bring about by voluntary submission, that all direct opinion or expert testimony and all direct testimony based on economic or statistical data be reduced to written sworn statements, and, together with the exhibits upon which based, be submitted to him and to the other parties to the proceeding by a date determined by the hearing officer and fixed a reasonable time in advance of the hearing; and that such sworn statements be acceptable as evidence upon formal offer at the hearing, subject to objection on any ground except that such sworn statements shall not be subject to challenge because the testimony is not presented orally, and provided that witnesses making such statements shall not be subject to cross-examination unless a request is made sufficiently in advance of the hearing to insure the presence of the witnesses. [Rule .08.480, effective 3/18/60, filed 3/23/60.]

WAC 296-10-490 Expert or opinion testimony and testimony based on economic or statistical data—Supporting data. That the hearing examiner or other appropriate officer, in his discretion but consistent with the rights of the parties, cause the parties to make available for inspection in advance of the hearing, and for purposes of cross-examination at the hearing, the data underlying statements and exhibits submitted in accordance with WAC 296-10-480, but, wherever practicable that he restrict to a minimum the placing of such data in the record. [Rule .08.490, effective 3/18/60, filed 3/23/60.]

WAC 296-10-500 Expert or opinion testimony and testimony based on economic or statistical data—Effect of noncompliance with WAC 296-10-470 or 296-10-480. Whenever the manner of introduction of opinion or expert testimony or testimony based on economic or statistical data is governed by requirements fixed under the provisions of WAC 296-10-470 or 296-10-480, such testimony not submitted in accordance with the relevant requirements shall not be received in evidence in the absence of a clear showing that the offering party had good cause for his failure to conform to such requirements. [Rule .08.500, effective 3/18/60, filed 3/23/60.]

WAC 296-10-510 Continuances. Any party who desires a continuance shall, immediately upon receipt of notice of hearing, or as soon thereafter as [facts] requiring such continuance come to his knowledge, notify the industrial welfare committee or its designated hearing officer of said desire, stating in detail the reasons why such continuance is necessary. The committee or its designated hearing officer, in passing upon a request for continuance, shall consider whether such request was promptly and timely made. For good cause shown the committee or its designated hearing officer may grant such continuance and may at any time order a continuance upon its or his own motion. During a hearing, if it appears in the public interest or in the interest of justice that further testimony or argument should be received, the examiner or other officer conducting the hearing may in his discretion continue the hearing and fix a date for introduction of additional evidence or presentation of argument. Such oral notice shall constitute final notice of such continued hearing. [Rule .08.510, effective 3/18/60, filed 3/23/60.]

WAC 296-10-520 Rules of evidence—Admissibility criteria. Subject to the other provisions of these rules, all relevant evidence is admissible which, in the opinion of the officer conducting the hearing, is the best evidence reasonably obtainable, having due regard for its necessity, availability and trustworthiness. In passing upon the admissibility of evidence, the officer conducting the hearing shall give consideration to, but shall not be bound to follow, the rules of evidence governing civil proceedings in matters not involving trial by jury, in the superior court of the state of Washington. [Rule .08.520, effective 3/18/60, filed 3/23/60.]

WAC 296-10-530 Rules of evidence—Tentative admission—Exclusion—Discontinuance—Objections. When objection is made to the admissibility of evidence such evidence may be received subject to a later ruling. The officer conducting the hearing may, in his discretion, either with or without objection, exclude inadmissible evidence or order cumulative evidence discontinued. Parties objecting to the introduction of evidence shall state the precise grounds of such objection at the time such evidence is offered. [Rule .08.530, effective 3/18/60, filed 3/23/60.]

WAC 296-10-540 Petitions for rule making, amendment or repeal—Who may petition. Any interested person may petition the industrial welfare committee requesting the promulgation, amendment, or repeal of any rule. [Rule .08.540, effective 3/18/60, filed 3/23/60.]

WAC 296-10-550 Petitions for rule making, amendment or repeal—Requisites. Where the petition requests the promulgation of a rule, the requested or proposed rule must be set out in full, the petition must also include all the reasons for the requested rule together with briefs of any applicable law. Where the petition requests the amendment or repeal of a rule presently in effect, the rule or portion of the rule in question must be set out as well as a suggested amended form if any. The petition must include all reasons for the requested amendment or repeal of the rule. [Rule .08.550, effective 3/18/60, filed 3/23/60.]

WAC 296-10-560 Petitions for rule making, amendment or repeal—Agency must consider. All petitions shall be considered by the industrial welfare committee and the committee may, in its discretion, order a hearing for the further consideration and discussion of the requested promulgation, amendment, repeal or modification of any rule. [Rule .08.560, effective 3/18/60, filed 3/23/60.]

WAC 296-10-570 Petitions for rule making, amendment or repeal—Notice of disposition. The industrial welfare committee shall notify the petitioning party within a reasonable time of the disposition, if any, of the petition. [Rule .08.570, effective 3/18/60, filed 3/23/60.]

WAC 296-10-580 Declaratory rulings. As prescribed by RCW 34.04.080, any interested person may petition the industrial welfare committee thereof for a declaratory ruling. The committee shall consider the petition and within a reasonable time shall: (1) Issue a nonbinding declaratory ruling; or

(2) Notify the person that no declaratory ruling is to be issued; or

(3) Set a reasonable time and place for a hearing or the submission of written evidence upon the matter, and give reasonable notification to the person of the time and place for such hearing or submission and of the issues involved.

(4) If a hearing is held or evidence is submitted as provided in subsection (3), the industrial welfare committee thereof shall within a reasonable time:

(a) Issue a binding declaratory rule; or

(b) Issue a nonbinding declaratory ruling; or

(c) Notify the person that no declaratory ruling is to be issued. [Rule .08.580, effective 3/18/60, filed 3/23/60.]

WAC 296-10-590 Forms. (1) Any interested person petitioning the industrial welfare committee for a declaratory ruling pursuant to RCW 34.04.080, shall generally adhere to the following form for such purpose.

At the top of the page shall appear the wording "Before the Industrial Welfare Committee". On the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for a Declaratory Ruling." Opposite the foregoing caption shall appear the word "Petition".

The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party. The second paragraph shall state all rules or statutes that may be brought into issue by the petition. Succeeding paragraphs shall set out the state of facts relied upon in form similar to that applicable to complaints in civil actions before the superior courts of this state. The concluding paragraphs shall contain the prayer of the petitioner. The petition shall be subscribed and verified in the manner prescribed for verification of complaints in the superior courts of this state.

The original and two legible copies shall be filed with the agency. Petitions shall be on white paper, either 8-1/2 x 11" or 8-1/2 x 13" in size.

(2) Any interested person petitioning the industrial welfare committee requesting the promulgation, amendment or repeal of any rules shall generally adhere to the following form for such purpose.

At the top of the page shall appear the wording, "Before the Industrial Welfare Committee". On the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for (state whether promulgation, amendment or repeal) of Rule (or Rules)". Opposite the foregoing caption shall appear the word "Petition".

The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party and whether petitioner seeks the promulgation of new rule or rules, or amendment or repeal of existing rule or rules. The second paragraph, in case of a proposed new rule or amendment of an existing rule, shall set forth the desired rule in its entirety. Where the petition is for amendment, the new matter shall be underscored and the matter proposed to be deleted shall appear in double parentheses. Where the petition is for repeal of an existing rule, such shall be stated and the rule proposed to be repealed shall either be set forth in full or shall be referred to by agency rule number. The third paragraph shall set forth concisely the reasons for the proposal of the petitioner and shall contain a statement as to the interest of the petitioner in the subject matter of the rule. Additional numbered paragraphs may be used to give full explanation of petitioner's reason for the action sought.

Petitions shall be dated and signed by the person or entity named in the first paragraph or by his attorney. The original and two legible copies of the petition shall be filed with the agency. Petitions shall be on white paper, either 8-1/2 x 11" or 8-1/2" x 13" in size. [Rule .08.590, effective 3/18/60, filed 3/23/60.]

Chapter 296-11 WAC

PRACTICE AND PROCEDURE—BOARD OF PILOTAGE COMMISSION

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WAC 296-11-001 General rule. The chairman of the board of pilotage commissioners is the director of the department of labor and industries. Information regarding the pilotage act, complaints and other matters coming under the provisions of the pilotage act and the board's rules and regulations may be handled by contacting the director or the board's secretary in person or in writing at the department of labor and industries, Olympia, Washington. Any matter filed with the director and/or secretary will be brought to the attention of the board at its next regular meeting, the date of which is the first Thursday of each month. Persons desiring to do so may also attend the board meetings, which are held in the Seattle, Washington, offices of the department of labor and industries.

The purpose and scope of activity of the board of pilotage commissioners is as follows:

- Scope: (1) Puget Sound and adjacent inland waters.
(2) Grays Harbor and Willapa Bay.

Purpose: (1) Protection of shipping and safety of human life.

- (2) Maintain efficient and competent pilotage service.
(3) Examining proficiency of potential pilots.
(4) Licensing pilots.
(5) Regulating pilots.
(6) Enforcing use of pilots.
(7) Compensation of pilots.
(8) Record monies earned by pilots, vessels piloted and mileage piloted.
(9) Receive and investigate reports of accidents.
(10) Hold hearings on complaints of misconduct or negligence of pilots, nonpayment of pilotage fees, nonuse of pilots when required or such other violations of the pilotage act as may be filed by interested parties. [Order 2-68, § 296-11-001, filed 11/1/68.]

WAC 296-11-002 Effective date and validity. The rules under chapter 296-11 WAC known as "Practice and Procedure - Board of Pilotage Commission" with the exception of WAC 296-11-002 and 296-11-080 shall remain in full force and effect as previously filed

and effective. There is added to Title 296 chapter 11 of the WAC a new section, WAC 296-11-001, which, with two amended sections, 296-11-002 and 296-11-080, will be effective on the 2nd day of December, 1968. The new section, amended sections and previously adopted sections shall remain in full force and effect unless repealed or amended by the board of pilotage commissioners. [Order 2-68, § 296-11-002, filed 11/1/68; Rule .08.591, effective 3/1/60, filed 3/23/60.]

WAC 296-11-010 Appearance and practice before agency—Who may appear. No person may appear in a representative capacity before the board of pilotage commissioners or its designated hearing officer 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 our state law.

(3) Persons otherwise qualified as possessing the requisite skill to appear and expertly represent others who have applied to the board of pilotage commissioners and have been duly authorized by the board to appear in a representative capacity before the board.

(4) A bona fide officer, partner, or full time employee of an individual firm, association, partnership, or corporation who appears for such individual firm, association, partnership, or corporation. [Rule .08.010, effective 3/1/60, filed 3/23/60.]

WAC 296-11-020 Appearance and practice before agency—Appearance in certain proceedings may be limited to attorneys. In all hearings involving the taking of testimony and the formulation of a record subject to review by the courts, where the board of pilotage commissioners or its designated hearing officer determines that representative activity in such hearing requires a high degree of legal training, experience, and skill, the board or its designated hearing officer may limit those who may appear in a representative capacity to attorneys at law. [Rule .08.020, effective 3/1/60, filed 3/23/60.]

WAC 296-11-030 Appearance and practice before agency—Solicitation of business unethical. It shall be unethical for persons acting in a representative capacity before the board of pilotage commissioners 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 indirectly by solicitors of any kind. [Rule .08.030, effective 3/1/60, filed 3/23/60.]

WAC 296-11-040 Appearance and practice before agency—Standards of ethical conduct. All persons appearing in proceedings before the board of pilotage commissioners 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. [Rule .08.040, effective 3/1/60, filed 3/23/60.]

WAC 296-11-050 Appearance and practice before agency—Appearance by former employee of board or member of attorney general's staff. No former employee of the board of pilotage commissioners 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, and in compliance with chapter 42.22 RCW, in a representative capacity on behalf of other parties in a formal proceeding wherein he previously took an active part as a representative of the board. [Rule .08.050, effective 3/1/60, filed 3/23/60.]

WAC 296-11-060 Appearance and practice before agency—Former employee as expert witness. No former employee of the board of pilotage commissioners shall at any time after severing his employment with the board appear, except with the written permission of the board, and in compliance with chapter 42.22 RCW, as an expert witness on behalf of other parties in a formal proceeding wherein he previously took an active part in the investigation as a representative of the board. [Rule .08.060, effective 3/1/60, filed 3/23/60.]

WAC 296-11-070 Computation of time. In computing any period of time prescribed or allowed by the board of pilotage commissioners' 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, unless it is a Saturday, Sunday or a legal holiday, in which event the period runs until the end of the next day which is neither a Saturday, Sunday nor a holiday. When the period of time prescribed or allowed is less than seven days, intermediate Saturdays, Sundays and holidays shall be excluded in the computation. [Rule .08.070, effective 3/1/60, filed 3/23/60.]

WAC 296-11-080 Notice and opportunity for hearing in contested cases. In any contested case, all parties shall be served with a notice at least 20 days before the date set for the hearing. The notice shall state the time, place and issues involved, as required by RCW 34.04.090(1). [Order 2-68, § 296-11-080, filed 11/1/68; Rule .08.080, effective 3/1/60, filed 3/23/60.]

WAC 296-11-090 Service of process—By whom served. The board of pilotage commissioners shall cause to be served all orders, notices and other papers issued by it, together with any other papers which it is required by law to serve. Every other paper shall be served by the party filing it. [Rule .08.090, effective 3/1/60, filed 3/23/60.]

WAC 296-11-100 Service of process—Upon whom served. All papers served by either the board of pilotage commissioners or any party shall be served upon all counsel of record at the time of such filing and upon parties not represented by counsel or upon their agents designated by them or by law. Any counsel entering an appearance subsequent to the initiation of the proceeding shall notify all other counsel then of record and all parties not represented by counsel of such fact. [Rule .08.100, effective 3/1/60, filed 3/23/60.]

WAC 296-11-110 Service of process—Service upon parties. The final order, and any other paper required to be served by the agency upon a party, shall be served upon such party or upon the agent designated by him or by law to receive service of such papers, and a copy shall be furnished to counsel of record. [Rule .08.110, effective 3/1/60, filed 3/23/60.]

WAC 296-11-120 Service of process—Method of service. Service of papers shall be made personally or, unless otherwise provided by law, by first-class, registered, or certified mail; or by telegraph. [Rule .08.120, effective 3/1/60, filed 3/23/60.]

WAC 296-11-130 Service of process—When service complete. Service upon parties shall be regarded as complete: By mail, upon deposit in the United States mail properly stamped and addressed; by telegraph, when deposited with a telegraph company properly addressed and with charges prepaid. [Rule .08.130, effective 3/1/60, filed 3/23/60.]

WAC 296-11-140 Service of process—Filing with agency. Papers required to be filed with the board of pilotage commissioners shall be deemed filed upon actual receipt by the board at the place specified in its rules accompanied by proof of service upon parties required to be served. [Rule .08.140, effective 3/1/60, filed 3/23/60.]

WAC 296-11-150 Subpoenas—Where provided by law—Form. Every subpoena shall state the name of the state of Washington board of pilotage commissioners and the title of the proceeding, if any, and shall command the person to whom it is directed to attend and give testimony or produce designated books, documents or things under his control at a specified time and place. [Rule .08.150, effective 3/1/60, filed 3/23/60.]

WAC 296-11-160 Subpoenas—Issuance to parties. Upon application of counsel or other representative authorized to practice before the agency for any party to a contested case, there shall be issued to such party subpoenas requiring the attendance and testimony of witnesses or the production of evidence in such proceeding. The board of pilotage commissioners may issue subpoenas to parties not so represented upon request or upon a showing of general relevance and reasonable scope of the testimony or evidence sought. [Rule .08.160, effective 3/1/60, filed 3/23/60.]

WAC 296-11-170 Subpoenas—Service. Unless the service of a subpoena is acknowledged on its face by the person subpoenaed, service shall be made by delivering a copy of the subpoena to such person and by tendering him on demand, if entitled to make such demand, the fees for one day's attendance and the mileage allowed by law. [Rule .08.170, effective 3/1/60, filed 3/23/60.]

WAC 296-11-180 Subpoenas—Fees. Witnesses summoned before the board of pilotage commissioners shall be paid by the party at whose instance they appear the same fees and mileage that are paid to witnesses in the superior courts of the state of Washington. [Rule .08.180, effective 3/1/60, filed 3/23/60.]

WAC 296-11-190 Subpoenas—Proof of service. The person serving the subpoena shall make proof of service by filing the subpoena and the required return, affidavit, or acknowledgment of service with the board of pilotage commissioners or the officer before whom the witness is required to testify or produce evidence. If service is made by a person other than an officer of the board, and such service has not been acknowledged by the witness, such person shall make an affidavit of service. Failure to make proof of service does not affect the validity of the service. [Rule .08.190, effective 3/1/60, filed 3/23/60.]

WAC 296-11-200 Subpoenas—Quashing. Upon motion made promptly, and in any event at or before the time specified in the subpoena for compliance, by the person to whom the subpoena is directed (and upon notice to the party to whom the subpoena was issued) the board of pilotage commissioners or its authorized member or officer may (1) quash or modify the subpoena if it is unreasonable or requires evidence not relevant to any matter in issue, or (2) condition denial of the motion upon just and reasonable conditions. [Rule .08.200, effective 3/1/60, filed 3/23/60.]

WAC 296-11-210 Subpoenas—Enforcement. Upon application and for good cause shown, the board of pilotage commissioners will seek judicial enforcement of subpoenas issued to parties and which have not been quashed. [Rule .08.210, effective 3/1/60, filed 3/23/60.]

WAC 296-11-220 Subpoenas—Geographical scope. Such attendance of witnesses and such production of evidence may be required from any place in the state of Washington, at any designated place of hearing. [Rule .08.220, effective 3/1/60, filed 3/23/60.]

WAC 296-11-230 Depositions and interrogatories in contested cases—Right to take. Except as may be otherwise provided, any party may take the testimony of any person, including a party, by deposition upon oral examination or written interrogatories for use as evidence in the proceeding, except that leave must be obtained if notice of the taking is served by a proponent

within twenty days after the filing of a complaint. The attendance of witnesses may be compelled by the use of a subpoena. Depositions shall be taken only in accordance with this rule and the rule of subpoenas. [Rule .08.230, effective 3/1/60, filed 3/23/60.]

WAC 296-11-240 Depositions and interrogatories in contested cases—Scope. Unless otherwise ordered, the deponent may be examined regarding any matter not privileged, which is relevant to the subject matter involved in the proceeding. [Rule .08.240, effective 3/1/60, filed 3/23/60.]

WAC 296-11-250 Depositions and interrogatories in contested cases—Officer before whom taken. Within the United States or within a territory or insular possession subject to the dominion of the United States depositions shall be taken before an officer authorized to administer oaths by the laws of the state of Washington or of the place where the examination is held; within a foreign country, depositions shall be taken before a secretary of an embassy or legation, consul general, vice consul or consular agent of the United States, or a person designated by the board of pilotage commissioners or agreed upon by the parties by stipulation in writing filed with the board. Except by stipulation, no deposition shall be taken before a person who is a party or the privy of a party, or a privy of any counsel of a party, or who is financially interested in the proceeding. [Rule .08.250, effective 3/1/60, filed 3/23/60.]

WAC 296-11-260 Depositions and interrogatories in contested cases—Authorization. A party desiring to take the deposition of any person upon oral examination shall give reasonable notice of not less than three days in writing to the board of pilotage commissioners and all parties. The notice shall state the time and place for taking the deposition, the name and address of each person to be examined, if known, and if the name is not known, a general description sufficient to identify him or the particular class or group to which he belongs. On motion of a party upon whom the notice is served, the hearing officer may for cause shown, enlarge or shorten the time. If the parties so stipulate in writing, depositions may be taken before any person, at any time or place, upon any notice, and in any manner and when so taken may be used as other depositions. [Rule .08.260, effective 3/1/60, filed 3/23/60.]

WAC 296-11-270 Depositions and interrogatories in contested cases—Protection of parties and deponents. After notice is served for taking a deposition, upon its own motion or upon motion reasonably made by any party or by the person to be examined and upon notice and for good cause shown the board of pilotage commissioners or its designated hearing officer may make an order that the deposition shall not be taken, or that it may be taken only at some designated place other than that stated in the notice, or that it may be taken only on written interrogatories, or that certain matters shall not be inquired into, or that the scope of the examination

shall be limited to certain matters, or that the examination shall be limited to certain matters, or that the examination shall be held with no one present except the parties to the action and their officers or counsel, or that after being sealed, the deposition shall be opened only by order of the board, or that business secrets or secret processes, developments, or research need not be disclosed, or that the parties shall simultaneously file specified documents or information enclosed in sealed envelopes to be opened as directed by the board, or the board may make any other order which justice requires to protect the party or witness from annoyance, embarrassment, or oppression. At any time during the taking of the deposition, on motion of any party or of the deponent and upon a showing that the examination is being conducted in bad faith or in such manner as unreasonably to annoy, embarrass, or oppress the deponent or party, the board or its designated hearing officer may order the officer conducting the examination to cease forthwith from taking the deposition, or may limit the scope and manner of the taking of the deposition as above provided. If the order made terminates the examination, it shall be resumed thereafter only upon the order of the agency. Upon demand of the objecting party or deponent, the taking of the deposition shall be suspended for the time necessary to make a motion for an order. [Rule .08.270, effective 3/1/60, filed 3/23/60.]

WAC 296-11-280 Depositions and interrogatories in contested cases—Oral examination and cross-examination. Examination and cross-examination shall proceed as at an oral hearing. In lieu of participating in the oral examination, any party served with notice of taking a deposition may transmit written cross interrogatories to the officer who, without first disclosing them to any person, and after the direct testimony is complete, shall propound them seriatim to the deponent and record or cause the answers to be recorded verbatim. [Rule .08.280, effective 3/1/60, filed 3/23/60.]

WAC 296-11-290 Depositions and interrogatories in contested cases—Recordation. The officer before whom the deposition is to be taken shall put the witness on oath and shall personally or by someone acting under his direction and in his presence, record the testimony by typewriter directly or by transcription from stenographic notes, wire or record recorders, which record shall separately and consecutively number each interrogatory. Objections to the notice, qualifications of the officer taking the deposition, or to the manner of taking it, or to the evidence presented or to the conduct of the officer, or of any party, shall be noted by the officer upon the deposition. All objections by any party not so made are waived. [Rule .08.290, effective 3/1/60, filed 3/23/60.]

WAC 296-11-300 Depositions and interrogatories in contested cases—Signing attestation and return. When the testimony is fully transcribed the deposition shall be submitted to the witness for examination and shall be read to or by him, unless such examination and reading are waived by the witness and by the parties.

Any changes in form or substance which the witness desires to make shall be entered upon the deposition by the officer with a statement of the reasons given by the witness for making them. The deposition shall then be signed by the witness, unless the parties by stipulation waive the signing or the witness is ill or cannot be found or refuses to sign. If the deposition is not signed by the witness, the officer shall sign it and state on the record the fact of the waiver or of the illness or absence of the witness or the fact of the refusal to sign together with the reasons, if any, given therefore; and the deposition may then be used as fully as though signed, unless on a motion to suppress the board of pilotage commissioners holds that the reasons given for the refusal to sign require rejection of the deposition in whole or in part.

The officer shall certify on the deposition that the witness was duly sworn by him and that the deposition is a true record of the testimony given by the witness. He shall then securely seal the deposition in an envelope indorsed with the title of proceeding and marked "Deposition of (here insert name of witness)" and shall promptly send it by registered or certified mail to the board of pilotage commissioners, or its designated hearing officer, for filing. The party taking the deposition shall give prompt notice of its filing to all other parties. Upon payment of reasonable charges therefor, the officer shall furnish a copy of the deposition to any party or to the deponent. [Rule .08.300, effective 3/1/60, filed 3/23/60.]

WAC 296-11-310 Depositions and interrogatories in contested cases—Use and effect. Subject to rulings by the hearing officer upon objections a deposition taken and filed as provided in this rule will not become a part of the record in the proceeding until received in evidence by the hearing officer upon his own motion or the motion of any party. Except by agreement of the parties or ruling of the hearing officer, a deposition will be received only in its entirety. A party does not make a party, or the privy of a party, or any hostile witness his witness by taking his deposition. Any party may rebut any relevant evidence contained in a deposition whether introduced by him or any other party. [Rule .08.310, effective 3/1/60, filed 3/23/60.]

WAC 296-11-320 Depositions and interrogatories in contested cases—Fees of officers and deponents. Deponents whose depositions are taken and the officers taking the same shall be entitled to the same fees as are paid for like services in the superior courts of the state of Washington which fees shall be paid by the party at whose instance the depositions are taken. [Rule .08.320, effective 3/1/60, filed 3/23/60.]

WAC 296-11-330 Depositions upon interrogatories—Submission of interrogatories. Where the deposition is taken upon written interrogatories, the party offering the testimony shall separately and consecutively number each interrogatory and file and serve them with a notice stating the name and address of the person who is to answer them and the name or descriptive title and address of the officer before whom they are to be taken.

Within 10 days thereafter a party so served may serve cross-interrogatories upon the party proposing to take the deposition. Within five days thereafter, the latter may serve redirect interrogatories upon the party who served cross-interrogatories. [Rule .08.330, effective 3/1/60, filed 3/23/60.]

WAC 296-11-340 Depositions upon interrogatories—Interrogation. Where the interrogatories are forwarded to an officer authorized to administer oaths as provided in WAC 296-11-250 the officer taking the same after duly swearing the deponent, shall read to him seriatim, one interrogatory at a time and cause the same and the answer thereto to be recorded before the succeeding interrogatory is asked. No one except the deponent, the officer and the court reporter or stenographer recording and transcribing it shall be present during the interrogation. [Rule .08.340, effective 3/1/60, filed 3/23/60.]

WAC 296-11-350 Depositions upon interrogatories—Attestation and return. The officer before whom interrogatories are verified or answered shall (1) certify under his official signature and seal that the deponent was duly sworn by him, that the interrogatories and answers are a true record of the deponent's testimony, that no one except deponent, the officer and the stenographer were present during the taking, and that neither he nor the stenographer, to his knowledge is a party, privy to a party, or interested in the event of the proceedings, and (2) promptly send by registered or certified mail the original copy of the deposition and exhibits with his attestation to the board of pilotage commissioners, or its designated hearing officer, one copy to the counsel who submitted the interrogatories and another copy to the deponent. [Rule .08.350, effective 3/1/60, filed 3/23/60.]

WAC 296-11-360 Depositions upon interrogatories—Provisions of deposition rule. In all other respects, depositions upon interrogatories shall be governed by the previous deposition rule. [Rule .08.360, effective 3/1/60, filed 3/23/60.]

WAC 296-11-370 Official notice—Matters of law. The board of pilotage commissioners or its hearing officer, upon request made before or during a hearing, will officially notice: (1) **Federal law.** The Constitution; congressional acts, resolutions, records, journals and committee reports; decisions of federal courts and administrative agencies; executive orders and proclamations; and all rules, orders and notices published in the Federal Register;

(2) **State law.** The constitution of the state of Washington, acts of the legislature, resolutions, records, journals and committee reports; decisions of administrative agencies of the state of Washington, executive orders and proclamations by the governor; and all rules, orders and notices filed with the code reviser.

(3) **Governmental organization.** Organization, territorial limitations, officers, departments, and general administration of the government of the state of

Washington, the United States, the several states and foreign nations;

(4) **Agency organization.** The board of pilotage commissioners' organization, administration, officers, personnel, official publications, and practitioners before its bar. [Rule .08.370, effective 3/1/60, filed 3/23/60.]

WAC 296-11-380 Official notice—Material facts. In the absence of controverting evidence, the board of pilotage commissioners and its hearing officers, upon request made before or during a hearing, may officially notice: (1) **Agency proceedings.** The pendency of, the issues and position of the parties therein, and the disposition of any proceeding then pending before or theretofore concluded by the board of pilotage commissioners;

(2) **Business customs.** General customs and practices followed in the transaction of business;

(3) **Notorious facts.** Facts so generally and widely known to all well-informed persons as not to be subject to reasonable dispute, or specific facts which are capable of immediate and accurate demonstration by resort to accessible sources of generally accepted authority, including but not exclusively, facts stated in any publication authorized or permitted by law to be made by any federal or state officer, department, or agency;

(4) **Technical knowledge.** Matters within the technical knowledge of the board of pilotage commissioners as a body of experts, within the scope or pertaining to the subject matter of its statutory duties, responsibilities or jurisdiction;

(5) **Request or suggestion.** Any party may request, or the hearing officer or the board of pilotage commissioners may suggest, that official notice be taken of a material fact, which shall be clearly and precisely stated, orally on the record, at any prehearing conference or oral hearing or argument, or may make such request or suggestion by written notice, any pleading, motion, memorandum, or brief served upon all parties, at any time prior to a final decision;

(6) **Statement.** Where an initial or final decision of the board of pilotage commissioners rests in whole or in part upon official notice of a material fact, such fact shall be clearly and precisely stated in such decision. In determining whether to take official notice of material facts, the hearing officer of the board may consult any source of pertinent information, whether or not furnished as it may be, by any party and whether or not admissible under the rules of evidence;

(7) **Controversion.** Any party may controvert a request or a suggestion that official notice of a material fact be taken at the time the same is made if it be made orally, or by a pleading, reply or brief in response to the pleading or brief or notice in which the same is made or suggested. If any decision is stated to rest in whole or in part upon official notice of a material fact which the parties have not had a prior opportunity to controvert, any party may controvert such fact by appropriate exceptions if such notice be taken in an initial or intermediate decision or by a petition for reconsideration if

notice of such fact be taken in a final report. Such controversion shall concisely and clearly set forth the sources, authority and other data relied upon to show the existence or nonexistence of the material fact assumed or denied in the decision;

(8) **Evaluation of evidence.** Nothing herein shall be construed to preclude the board of pilotage commissioners or its authorized agents from utilizing their experience, technical competence, and specialized knowledge in the evaluation of the evidence presented to them. [Rule .08.380, effective 3/1/60, filed 3/23/60.]

WAC 296-11-390 Presumptions. Upon proof of the predicate facts specified in the following six subsections hereof without substantial dispute and by direct, clear, and convincing evidence, the board of pilotage commissioners, with or without prior request or notice, may make the following presumptions, where consistent with all surrounding facts and circumstances: (1) **Continuity.** That a fact of a continuous nature, proved to exist at a particular time, continues to exist as of the date of the presumption, if the fact is one which usually exists for at least that period of time;

(2) **Identity.** That persons and objects of the same name and description are identical;

(3) **Delivery.** Except in a proceeding where the liability of the carrier for nondelivery is involved, that mail matter, communications, express or freight, properly addressed, marked, billed and delivered respectively to the post office, telegraph, cable or radio company, or authorized common carrier of property with all postage, tolls and charges properly prepaid, is or has been delivered to the addressee or consignee in the ordinary course of business;

(4) **Ordinary course.** That a fact exists or does not exist, upon proof of the existence or nonexistence of another fact which in the ordinary and usual course of affairs, usually and regularly co-exists with the fact presumed;

(5) **Acceptance of benefit.** That a person for whom an act is done or to whom a transfer is made has, does or will accept same where it is clearly in his own self-interest so to do;

(6) **Interference with remedy.** That evidence, with respect to a material fact which in bad faith is destroyed, eloiigned, suppressed or withheld by a party in control thereof, would if produced, corroborate the evidence of the adversary party with respect to such fact. [Rule .08.390, effective 3/1/60, filed 3/23/60.]

WAC 296-11-400 Stipulations and admissions of record. The existence or nonexistence of a material fact, as made or agreed in a stipulation or in an admission of record, will be conclusively presumed against any party bound thereby, and no other evidence with respect thereto will be received upon behalf of such party, provided: (1) **Upon whom binding.** Such a stipulation or admission is binding upon the parties by whom it is made, their privies and upon all other parties to the proceeding who do not expressly and unequivocally deny the existence or nonexistence of the material fact so admitted or stipulated, upon the making thereof, if made on the

record at a pre-hearing conference, oral hearing, oral argument or by a writing filed and served upon all parties within five days after a copy of such stipulation or admission has been served upon them;

(2) **Withdrawal.** Any party bound by a stipulation or admission of record at any time prior to final decision may be permitted to withdraw the same in whole or in part by showing to the satisfaction of the hearing officer or the board of pilotage commissioners that such stipulation or admission was made inadvertently or under a bona fide mistake of fact contrary to the true fact and that its withdrawal at the time proposed will not unjustly prejudice the rights of other parties to the proceeding. [Rule .08.400, effective 3/1/60, filed 3/23/60.]

WAC 296-11-410 Form and content of decisions in contested cases. Every decision and order, whether proposed, initial, or final, shall: (1) Be correctly captioned as to name of agency and name of proceeding;

(2) Designate all parties and counsel to the proceeding;

(3) Include a concise statement of the nature and background of the proceeding;

(4) Be accompanied by appropriate numbered findings of fact and conclusions of law;

(5) Whenever practical, include the reason or reasons for the particular order or remedy afforded;

(6) Wherever practical, be referenced to specific provisions of the law and/or regulations appropriate thereto, together with reasons and precedents relied upon to support the same. [Rule .08.410, effective 3/1/60, filed 3/23/60.]

WAC 296-11-420 Definition of issues before hearing. In all proceedings the issues to be adjudicated shall be made initially as precise as possible, in order that hearing officers may proceed promptly to conduct the hearings on relevant and material matter only. [Rule .08.420, effective 3/1/60, filed 3/23/60.]

WAC 296-11-430 Prehearing conference rule—Authorized. In any proceeding the board of pilotage commissioners or its designated hearing officer upon its or his own motion, or upon the motion of one of the parties or their qualified representatives, may in its or his discretion direct the parties or their qualified representatives to appear at a specified time and place for a conference to consider (1) The simplification of the issues;

(2) The necessity of amendments to the pleadings;

(3) The possibility of obtaining stipulations, admissions of facts and of documents;

(4) The limitation of the number of expert witnesses;

(5) Such other matters as may aid in the disposition of the proceeding. [Rule .08.430, effective 3/1/60, filed 3/23/60.]

WAC 296-11-440 Prehearing conference rule—Record of conference action. The board of pilotage commissioners or its designated hearing officer shall make an order or statement which recites the action taken at the conference, the amendments allowed to the pleadings

and the agreements made by the parties or their qualified representatives as to any of the matters considered, including the settlement or simplification of issues, and which limits the issues for hearing to those not disposed of by admissions or agreements; and such order or statement shall control the subsequent course of the proceeding unless modified for good cause by subsequent order. [Rule .08.440, effective 3/1/60, filed 3/23/60.]

WAC 296-11-450 Submission of documentary evidence in advance. Where practicable the board of pilotage commissioners or its designated hearing officer may require: (1) That all documentary evidence which is to be offered during the taking of evidence be submitted to the hearing examiner and to the other parties to the proceeding sufficiently in advance of such taking of evidence to permit study and preparation of cross-examination and rebuttal evidence;

(2) That documentary evidence not submitted in advance, as may be required by subsection (1), be not received in evidence in the absence of a clear showing that the offering party had good cause for his failure to produce the evidence sooner;

(3) That the authenticity of all documents submitted in advance in a proceeding in which such submission is required, be deemed admitted unless written objection thereto is filed prior to the hearing, except that a party will be permitted to challenge such authenticity at a later time upon a clear showing of good cause for failure to have filed such written objection. [Rule .08.450, effective 3/1/60, filed 3/23/60.]

WAC 296-11-460 Excerpts from documentary evidence. When portions only of a document are to be relied upon, the offering party shall prepare the pertinent excerpts, adequately identified, and shall supply copies of such excerpts, together with a statement indicating the purpose for which such materials will be offered, to the hearing examiner and to the other parties. Only the excerpts, so prepared and submitted, shall be received in the record. However, the whole of the original document shall be made available for examination and for use by all parties to the proceeding. [Rule .08.460, effective 3/1/60, filed 3/23/60.]

WAC 296-11-470 Expert or opinion testimony and testimony based on economic or statistical data—Number and qualifications of witnesses. That the hearing examiner or other appropriate officer in all classes of cases where practicable make an effort to have the interested parties agree upon the witness or witnesses who are to give expert or opinion testimony, either by selecting one or more to speak for all parties or by limiting the number for each party; and, if the interested parties cannot agree, require them to submit to him and to the other parties written statements containing the names, addresses and qualifications of their respective opinion or expert witnesses, by a date determined by him and fixed sufficiently in advance of the hearing to permit the other interested parties to investigate such qualifications. [Rule .08.470, effective 3/1/60, filed 3/23/60.]

WAC 296-11-480 Expert or opinion testimony and testimony based on economic or statistical data—Written sworn statements. That the hearing examiner or other appropriate officer, in all classes of cases in which it is practicable and permissible, require, and when not so permissible, make every effort to bring about by voluntary submission, that all direct opinion or expert testimony and all direct testimony based on economic or statistical data be reduced [reduced] to written sworn statements, and, together with the exhibits upon which based, be submitted to him and to the other parties to the proceeding by a date determined by the hearing officer and fixed a reasonable time in advance of the hearing; and that such sworn statements be acceptable as evidence upon formal offer at the hearing, subject to objection on any ground except that such sworn statements shall not be subject to challenge because the testimony is not presented orally, and provided that witnesses making such statements shall not be subject to cross-examination unless a request is made sufficiently in advance of the hearing to insure the presence of the witnesses. [Rule .08.480, effective 3/1/60, filed 3/23/60.]

WAC 296-11-490 Expert or opinion testimony and testimony based on economic or statistical data—Supporting data. That the hearing examiner or other appropriate officer, in his discretion but consistent with the rights of the parties, cause the parties to make available for inspection in advance of the hearing, and for purposes of cross-examination at the hearing, the data underlying statements and exhibits submitted in accordance with WAC 296-11-480, but, wherever practicable that he restrict to a minimum the placing of such data in the record. [Rule .08.490, effective 3/1/60, filed 3/23/60.]

WAC 296-11-500 Expert or opinion testimony and testimony based on economic or statistical data—Effect of noncompliance with WAC 296-11-470 or 296-11-480. Whenever the manner of introduction of opinion or expert testimony or testimony based on economic or statistical data is governed by requirements fixed under the provisions of WAC 296-11-470 or 296-11-480, such testimony not submitted in accordance with the relevant requirements shall not be received in evidence in the absence of a clear showing that the offering party had good cause for his failure to conform to such requirements. [Rule .08.500, effective 3/1/60, filed 3/23/60.]

WAC 296-11-510 Continuances. Any party who desires a continuance shall, immediately upon receipt of notice of a hearing, or as soon thereafter as facts requiring such continuance come to his knowledge, notify the board of pilotage commissioners or its designated hearing officer of said desire, stating in detail the reasons why such continuance is necessary. The board or its designated hearing officer, in passing upon a request for continuance, shall consider whether such request was promptly and timely made. For good cause shown, the board or its designated hearing officer may grant such a

continuance and may at any time order a continuance upon its or his own motion. During a hearing, if it appears in the public interest or in the interest of justice that further testimony or argument should be received, the examiner or other officer conducting the hearing may in his discretion continue the hearing and fix the date for introduction of additional evidence or presentation of argument. Such oral notice shall constitute final notice of such continued hearing. [Rule .08.510, effective 3/1/60, filed 3/23/60.]

WAC 296-11-520 Rules of evidence—Admissibility criteria. Subject to the other provisions of these rules, all relevant evidence is admissible which, in the opinion of the officer conducting the hearing, is the best evidence reasonably obtainable, having due regard for its necessity, availability and trustworthiness. In passing upon the admissibility of evidence, the officer conducting the hearing shall give consideration to, but shall not be bound to follow, the rules of evidence governing civil proceedings, in matters not involving trial by jury, in the superior court of the state of Washington. [Rule .08.520, effective 3/1/60, filed 3/23/60.]

WAC 296-11-530 Rules of evidence—Tentative admission—Exclusion—Discontinuance—Objections. When objection is made to the admissibility of evidence, such evidence may be received subject to a later ruling. The officer conducting the hearing may, in his discretion, either with or without objection, exclude inadmissible evidence or order cumulative evidence discontinued. Parties objecting to the introduction of evidence shall state the precise grounds of such objection at the time such evidence is offered. [Rule .08.530, effective 3/1/60, filed 3/23/60.]

WAC 296-11-540 Petitions for rule making, amendment or repeal—Who may petition. Any interested person may petition the board of pilotage commissioners requesting the promulgation, amendment, or repeal of any rule. [Rule .08.540, effective 3/1/60, filed 3/23/60.]

WAC 296-11-550 Petitions for rule making, amendment or repeal—Requisites. Where the petition requests the promulgation of a rule, the requested or proposed rule must be set out in full. The petition must also include all the reasons for the requested rule together with briefs of any applicable law. Where the petition requests the amendment or repeal of a rule presently in effect, the rule or portion of the rule in question must be set out as well as a suggested amended form, if any. The petition must include all reasons for the requested amendment or repeal of the rule. [Rule .08.550, effective 3/1/60, filed 3/23/60.]

WAC 296-11-560 Petitions for rule making, amendment or repeal—Agency must consider. All petitions shall be considered by the board of pilotage commissioners and the board may, in its discretion, order a hearing for the further consideration and discussion of the requested promulgation, amendment, repeal, or

modification of any rule. [Rule .08.560, effective 3/1/60, filed 3/23/60.]

WAC 296-11-570 Petitions for rule making, amendment or repeal—Notice of disposition. The board of pilotage commissioners shall notify the petitioning party within a reasonable time of the disposition, if any, of the petition. [Rule .08.570, effective 3/1/60, filed 3/23/60.]

WAC 296-11-580 Declaratory rulings. As prescribed by RCW 34.04.080, any interested person may petition the board of pilotage commissioners for a declaratory ruling. The board shall consider the petition and within a reasonable time the board shall: (1) Issue a nonbinding declaratory ruling; or

(2) Notify the person that no declaratory ruling is to be issued or

(3) Set a reasonable time and place for a hearing or the submission of written evidence upon the matter, and give reasonable notification to the person of the time and place for such hearing or submission and of the issues involved.

(4) If a hearing is held or evidence is submitted as provided in subsection (3), the board shall within a reasonable time:

(a) Issue a binding declaratory rule; or

(b) Issue a nonbinding declaratory ruling; or

(c) Notify the person that no declaratory ruling is to be issued. [Rule .08.580, effective 3/1/60, filed 3/23/60.]

WAC 296-11-590 Forms. (1) Any interested person petitioning the board of pilotage commissioners for a declaratory ruling pursuant to RCW 34.04.080, shall generally adhere to the following form for such purpose.

(a) At the top of the page shall appear the wording "Before the Board of Pilotage Commissioners, State of Washington", on the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for a Declaratory Ruling". Opposite the foregoing caption shall appear the word "Petition".

(b) The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party. The second paragraph shall state all rules or statutes that may be brought into issue by the petition. Succeeding paragraphs shall set out the state of facts relied upon in form similar to that applicable to complaints in civil actions before the superior courts of this state. The concluding paragraphs shall contain the prayer of the petitioner. The petition shall be subscribed and verified in the manner prescribed for verification of complaints in the superior courts of this state.

(c) The original and two legible copies shall be filed with the agency. Petitions shall be on white paper, either 8 1/2" x 11" or 8 1/2" x 13" in size.

(2) Any interested person petitioning the board of pilotage commissioners requesting the promulgation, amendment or repeal of any rules shall generally adhere to the following form for such purpose.

(a) At the top of the page shall appear the wording "Before the Board of Pilotage Commissioners, State of Washington". On the left side of the page below the foregoing the following caption shall be set out: "In the Matter of the Petition of (name of petitioning party) for (state whether promulgation, amendment or repeal) of Rule (or Rules)". Opposite the foregoing caption shall appear the word "Petition".

(b) The body of the petition shall be set out in numbered paragraphs. The first paragraph shall state the name and address of the petitioning party and whether petitioner seeks the promulgation of new rule or rules, or amendment or repeal of existing rule or rules. The second paragraph, in case of a proposed new rule or amendment of an existing rule, shall set forth the desired rule in its entirety. Where the petition is for amendment, the new matter shall be underscored and the matter proposed to be deleted shall appear in double parentheses. Where the petition is for repeal of an existing rule, such shall be stated and the rule proposed to be repealed shall either be set forth in full or shall be referred to by agency rule number. The third paragraph shall set forth concisely the reasons for the proposal of the petitioner and shall contain a statement as to the interest of the petitioner in the subject matter of the rule. Additional numbered paragraphs may be used to give full explanation of petitioner's reason for the action sought.

(c) Petitions shall be dated and signed by the person or entity named in the first paragraph or by his attorney. The original and two legible copies of the petition shall be filed with the agency. Petitions shall be on white paper, either 8 1/2" x 11" or 8 1/2" x 13" in size. [Rule .08.590, effective 3/1/60, filed 3/23/60.]

Chapter 296-13 WAC
PRACTICE AND PROCEDURE—ELECTRICAL
ADVISORY BOARD

WAC

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WAC 296-13-001 Foreword. (1) The state electricians and electrical installations law, chapter 19.28 RCW, establishes the governor appointed electrical advisory board and fixes its administrative responsibilities. The advisory board's principal function is to assist the director of labor and industries in adopting and promulgating reasonable rules and regulations in furtherance of safety to life and property with respect to electrical installations and appliances. While the advisory board will, upon request of the director of the department of labor

and industries or the electrical inspection division thereof, aid in the administrative interpretation of the National Electrical Code and the rules and regulations covering standards for electrical installations in the state of Washington, it will not function as board of appeal 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 installing wires or equipment to convey electric current, or engaged in installing apparatus or appliances to be operated by such current.

(2) 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 electrical installations in the state of Washington or relative to the operation of the electrical inspection division of such department may be heard. [Foreword, filed 10/15/65.]

WAC 296-13-010 Definitions. Whenever used in these rules, the words:

(1) **Board:** Shall mean the Washington state electrical advisory board appointed by the governor pursuant to RCW 19.28.065.

(2) **Department:** Shall mean the department of labor and industries of the state of Washington.

(3) **Director:** Shall mean the director of the department of labor and industries.

(4) **Regular meeting:** Shall mean the quarterly meetings held by the board on the last Friday of the first month of each calendar quarter, being January, April, July and October.

(5) **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. [Definitions, filed 10/15/65.]

WAC 296-13-020 Officers. In addition to the chairman and secretary of the board, as provided for by RCW 19.28.065, the board shall elect from its members a vice chairman who shall perform all functions of the chairman in his absence. [§ I, filed 10/15/65.]

WAC 296-13-030 Internal management. The board shall adopt written rules of procedure for its internal management which shall include "Roberts' Rules of Order, Revised", copies of which rules of procedure shall be made available to interested persons upon written request. [§ II, filed 10/15/65.]

WAC 296-13-040 Duties. (1) The board shall study proposed rules and regulations submitted to it by the director or by the electrical inspection division 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 electrical inspection division.

(3) The board shall at each regular or special meeting consider any written proposals made by any persons, firms or corporations for new electrical rules or regulations or for amendments to or repeal of existing electrical rules or regulations or for changes in administrative procedures of the electrical inspection division 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 meeting. [§ III, filed 10/15/65.]

WAC 296-13-050 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 electrical installations in the state of Washington, or relative to the operation of the electrical inspection division 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 be next regular meeting, setting forth a summary of any and all proposals on which the hearing is requested. [§ IV, filed 10/15/65.]

WAC 296-13-060 Appearance and practice before 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 subsections (1) and (2) above) appointed in writing to represent an individual, firm, association, organization, partnership or corporation. [§ V, filed 10/15/65.]

WAC 296-13-070 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. [§ VI, filed 10/15/65.]

WAC 296-13-080 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. [§ VII, filed 10/15/65.]

WAC 296-13-090 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. [§ VIII, filed 10/15/65.]

WAC 296-13-100 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 a representative of the board. [§ IX, filed 10/15/65.]

WAC 296-13-110 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. [§ X, filed 10/15/65.]

WAC 296-13-120 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. [§ XI, filed 10/15/65.]

Chapter 296-14 WAC

INDUSTRIAL INSURANCE—RECIPROCAL AGREEMENT

WAC

296-14-010 Reciprocal agreements—Industrial insurance.

WAC 296-14-010 Reciprocal agreements—Industrial insurance. (1) In accordance with the authority contained in RCW 51.12.120, the director of the department of labor and industries has heretofore or may hereafter enter into certain reciprocal agreements with other states and provinces of Canada and the agencies of such states or provinces which administer workers' compensation laws with respect to conflicts of jurisdiction and the assumption of jurisdiction in cases where the contract of employment arises in one state or province and the injury occurs in another.

(2) Consistent with the provisions of RCW 51.12.120 and chapter 34.04 RCW, the director of the department of labor and industries has entered into reciprocal agreements with other states and provinces which are in full force and effect on the subject matter as set forth in subsection (1) which states and provinces are:

- (a) Colorado
- (b) Idaho
- (c) Montana
- (d) North Dakota

- (e) Nevada
- (f) Oregon
- (g) Wyoming
- (h) South Dakota

(3) The reciprocal agreements as listed above in subsection (2) are hereby promulgated and adopted as regulations of the department in accordance with the provisions of RCW 51.12.120 and such reciprocal agreements shall be kept on file in the office of the director of the department of labor and industries and available for public inspection and review during the regular business hours of such office. [Order 74-29, § 296-14-010, filed 5/29/74, effective 7/1/74.]

Chapter 296-15 WAC WORKMEN'S COMPENSATION SELF- INSURANCE RULES AND REGULATIONS

WAC

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WAC 296-15-010 Preamble and authority. These rules and regulations governing workmen's compensation self-insurance plans were adopted by the Director of the Department of Labor and Industries in accordance with sections 27, 47, and 59, chapter 289, Laws of 1971 1st ex. sess., and chapter 51.14 RCW. These rules and regulations were adopted to implement and make specific those sections of chapter 289, Laws of 1971 1st ex. sess., relating to workmen's compensation self-insurance. [Order 71-15, § 296-15-010, filed 12/1/71.]

WAC 296-15-020 Application. (1) The application for certification to self-insure will be made on a form prescribed by the Supervisor of Industrial Insurance

which will elicit necessary information as to an employer's qualifications for self-insurance.

(2) The application form (SIF #1) shall be supplied by the Supervisor of Industrial Insurance to an employer upon the employer's request. It shall be completely and accurately filled out by the employer, and forwarded, with all necessary supporting documents, to the director.

(3) The director shall consider all matters relating to the applicant's qualifications to perform as a self-insurer, and shall advise the employer of the action taken on the application within a reasonable period of time and in no instance less than 21 calendar days before the requested certification date: *Provided*, That if deemed necessary for obtaining of further information, the director may extend the time for acting on the application. [Order 77-19, § 296-15-020, filed 9/26/77; Order 71-15, § 296-15-020, filed 12/1/71.]

WAC 296-15-030 Posting of security. (1) Upon receiving a completed application for certification to self-insure, the director shall review the matter and notify the employer of the amount of security which must be deposited to secure the payment of compensation and assessments, pursuant to RCW 51.14.020 as now or hereafter amended. This amount as so established may be satisfied by the employer's supplying of money, corporate or governmental securities approved by the director, or a surety bond, written by a company admitted to transact surety business in this state, in favor of the department. All such securities of a self-insurer shall be deposited with an escrow agent appointed by the director and administered pursuant to a written agreement between the department, the self-insurer and the escrow agent. The original of all surety bonds submitted by self-insurers following approval by the director, the Attorney General and the State Insurance Commissioner, will be kept on file in the Olympia office of the Division of Industrial Insurance of the department.

(2) The amount of security required of each self-insurer shall be reviewed annually by the director to determine if there is need for any increase or decrease thereof, and to facilitate this review and determination, a Self-Insurer's Annual Report (SIF #7) shall be required in the form prescribed by the director and supplied to all self-insurers. [Order 77-19, § 296-15-030, filed 9/26/77; Order 72-4, § 296-15-030, filed 4/25/72; Order 71-15, § 296-15-030, filed 12/1/71.]

WAC 296-15-040 Payment of deficit. In determining a self-insurer's proper share of any deficit which must be paid to the department, pursuant to RCW 51.14.020(4) as now or hereafter amended the following procedures shall apply:

(1) The total state fund deficit, as of 12-31-70 as estimated at the date of certification of an employers right to self-insure shall be determined by the department based on the actuarial solvency of the state fund as a whole in accordance with recognized workmen's compensation insurance principles. The percentage which such total deficit bears to actual total claim costs of the state fund over the preceding four calendar years ending December 31, 1970, exclusive of administrative costs

and second injury and catastrophe class costs, shall then be determined.

(2) The deficit attributable to each classification shall be determined by applying the same percentage as determined under subsection (1) to the actual total claim costs of each classification over the preceding four calendar years ending December 31, 1970.

(3) A self-insurer's proper share of the deficit attributable to this class shall be in the proportion the self-insurer's actual claim costs paid over the preceding four calendar years ending December 31, 1970 bear to the total claim costs in said class over the corresponding period.

(4) The department shall determine the total amount of an employer's premium due for the period since January 1, 1971 until either the date the employer was certified to be a self-insurer or the date an applicant firm will become a self-insurer.

The total amount of both Accident Fund and Medical Aid Fund premiums so determined shall be the basis of this procedure. To the total amount of premiums shall be added any excess amounts already paid by a self-insurer to comply with previous rules. This would include any payment of deficit in excess of the amount required by paragraph (3) and any Medical Aid Surcharge payments.

A record shall be established crediting any and all such payments. All claims costs charged an employer's account, for claims with a date of injury on or after January 1, 1971, and before its date of certification shall be subtracted from this established record of the firm's credit balance. In claims where pensions have been established, the amount charged against the employer's account for the pension shall be all amounts transferred from the accident fund to the pension reserve fund. Claim costs shall include compensation paid from the Accident Fund pursuant to chapter 51.32 RCW, amounts transferred from the Accident Fund in accordance with RCW 51.44.070, and medical benefits paid from the Medical Aid Fund pursuant to chapter 51.36 RCW. Claim costs shall be reduced by amounts recovered in third party actions, net of attorney's fees.

When such an accounting has been made and the resulting balance indicates the employer's claim costs have exceeded the amount of premium paid, the employer shall pay any debit balance prior to being certified as a self-insurer or continuing as a self-insurer if presently certified. When the balance indicates claim costs have been less than the amount of premium paid, the employer shall make no immediate payment.

The department shall maintain an ongoing account for each self-insured employer and report any charges made against the account to the employer each calendar quarter. When an employer's account is entirely spent, the employer shall reimburse the department for any and all future claim costs each quarter upon receipt of a statement identifying the amounts paid and, therefore, payable to the department.

Employers certified to self-insure prior to the effective date of this rule shall have a period of ninety days, after receiving the department's data regarding total premium credit and total claim costs, to decide whether

to remain a self-insurer or voluntarily surrender their certification and enroll in State Fund coverage.

If an employer decides to continue as a self-insurer, the responsibility for all costs of claims originating on or after January 1, 1971 shall become the employer's and remain with the employer into perpetuity.

Employers certified to self-insure subsequent to the effective date of this rule shall assume the responsibility for costs of claims originating on or after January 1, 1971 and shall retain that responsibility into perpetuity as well as the liabilities incurred as a self-insured employer.

(5) To the extent that the department may not have all the necessary fiscal information, as of the effective date of the employer's qualification to self-insure, to determine the precise monetary amount of his proper deficit payment, the department shall make its best estimate of said amount and require payment thereof before issuing a self-insurer's certification. Upon subsequently determining the exact deficit amount, the department shall promptly make the necessary adjustment for the prior deficit estimate payment. If an additional payment is required, the self-insurer shall promptly pay the same to the department upon demand; and failure to do so shall constitute grounds for withdrawal of the self-insurer's certification. [Order 77-19, § 296-15-040, filed 9/26/77; Order 73-24, § 296-15-040, filed 11/23/73; Order 71-15, § 296-15-040, filed 12/1/71.]

WAC 296-15-050 Reinsurance. [(1)] A self-insurer who desires to reinsure a portion of his liability, pursuant to RCW 51.14.020(5) as now or hereafter amended, shall notify the department of the name of the insurance carrier which will carry such reinsurance policy, and full details as to the extent and period of coverage of such policy. The director may periodically require information from all self-insurers as to their reinsurance program, if any, in order to determine that there is continued compliance with RCW 51.14.020(5).

(2) All copies of any insurance policy in force shall be submitted to the department, together with any modification or renewal provisions thereto which the employer has acquired for the purposes authorized in RCW 51.14.020(5) of reinsuring a portion of the employer's liability: *Provided*, That the supervisor upon request and for good cause may accept a certificate of insurance in lieu of the self-insured employer's policy of reinsurance which certifies to the monetary limits, all conditions and exceptions pertaining to payments under the self-insured employer's policy of reinsurance and in addition contains a certification that the company providing reinsurance and its personnel do not participate in the administration of the responsibilities of the self-insurer under Title 51 RCW and that such policy of reinsurance does not provide for payments in excess of eighty percent of the self-insured employer's liabilities under the provisions of Title 51 RCW.

(3) Each such policy of insurance issued or renewed on or after July 1, 1975 shall contain a provision which in substance states: That such policy is not intended to provide for the payment of any of the costs, benefits or compensation which the self-insured employer may be

obligated to pay pursuant to the provisions of Title 51 RCW, in excess of eighty percent of any such liabilities as required by RCW 51.14.020(5). [Order 77-19, § 296-15-050, filed 9/26/77; Order 71-15, § 296-15-050, filed 12/1/71.]

Reviser's Note: RCW 34.04.058 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 296-15-060 Administrative cost assessment.

(1) Assessments levied by the department against each self-insurer shall be based on the self-insured employer's proportionate share of the administrative costs determined to be attributable to self-insurers, including expenses of the Safety Division, the Industrial Insurance Division, the University of Washington Environmental Research Facility, the Board of Industrial Insurance Appeals, appeals expenses, and other general administrative expenses.

(2) The director shall determine the assessment rate annually, prescribing the self-insured employer's share of the attributable costs determined pursuant to the provisions of subsection (1). For employers who have been covered under the Workmen's Compensation Act for a period of less than two full calendar years, the assessment rate shall be a percentage of the premium which would have been collected at manual rates had the self-insurer been covered by the State Fund. For employers who have been subject to the provisions of the Workmen's Compensation Act in excess of two calendar years, the administrative assessment rate shall be a percentage of the payments made on all claims involving the self-insured employer: *Provided*, That in any event a self-insured employer shall be subject to the payment of a minimum quarterly assessment of twenty-five dollars.

(3) Administrative cost assessments shall be payable for each quarter, by the thirtieth day following the receipt of a quarterly report form supplied by the department (SIF #6). This quarterly report form shall also provide for payment of the Supplemental Pension Fund assessment.

(4) A self-insured employer who has, or shall hereafter, voluntarily, or involuntarily, surrender his certification as a self-insurer shall pay an adjusted administrative assessment. The amount of this adjusted administrative assessment will be determined annually and shall represent such self-insurer's portion of the administrative assessment which can be attributed directly to the operational costs of the office of the Manager of Self-Insurance. This adjusted administrative assessment shall continue until such time as all liabilities and all responsibilities of such employer have been terminated. The amount of this adjusted administrative assessment shall in no case be less than \$25.00 per calendar quarter.

When such an employer has had no self-insured claim activity, excluding activity in cases of total permanent disability or death, for a period of one year, a request may be made to the department for a review to determine if there is a need to continue the adjusted administrative assessment, in which circumstances, the

minimum assessment will not apply. [Order 77-19, § 296-15-060, filed 9/26/77; Order 75-28, § 296-15-060, filed 8/29/75, effective 1/1/76; Order 74-38, § 296-15-060, filed 11/18/74, effective 1/1/75; Order 73-24, § 296-15-060, filed 11/23/73; Order 71-15, § 296-15-060, filed 12/1/71.]

WAC 296-15-070 Accident reports and claims procedures. (1) Reporting of accidents and applications for compensation based thereon shall be on a form prescribed by the department, entitled the Self-Insurer's Report of Accident (SIF #2), which will be supplied to all self-insurers, and by self-insurers to their employees. Forwarding a completed copy of this form to the department shall satisfy the self-insurer's initial accident reporting responsibility under the law.

Noncompensable (medical-only) claims may be withheld from submission to the department for a period not to exceed thirty calendar days. The delayed filing is permissible where by so doing the request for closure can accompany the original submission of the claim.

(2) A self-insurer, on denying any claim, shall mail to the claimant, the department, and the attending physician, within seven days after such self-insurer has notice of the claim, a Notice of Denial of Claim, substantially identical to the example SIF #4, incorporated herein by reference. With every such claim denial a self-insurer shall send to the department all information on which the denial was based.

(3) A self-insurer must file in all claims a Supplemental or Final Report on Injury or Occupational Disease, on a form substantially identical to the example SIF #5, incorporated herein by reference, at the following times:

(a) On the date the first time loss compensation is paid.

(b) On the date the time loss compensation is terminated or the rate thereof changed.

(c) On the date a determination is requested.

All medical reports and other pertinent information in the self-insurer's possession must be submitted with the request for all determinations, except in noncompensable claims (medical only).

Self-insurers shall not unreasonably delay action on a claim nor fail to keep the department informed of the existence of an extended or continuing claim. [Order 77-19, § 296-15-070, filed 9/26/77; Order 72-15, § 296-15-070, filed 8/4/72; Order 71-15, § 296-15-070, filed 12/1/71.]

WAC 296-15-080 Statement of financial condition. Each employer authorized to self-insure the liabilities imposed by the industrial insurance law (Title 51 RCW) shall not later than the first day of July in each year commencing July 1, 1975, provide the Supervisor of Industrial Insurance of the Department of Labor and Industries with a current statement of:

The financial condition of the employer's business enterprise including all subsidiaries. Said statement shall have been completed not more than one year prior to the due date as set forth above. The statement of financial condition must be prepared by accountants independent

of the employer and certified to by such accountants: *Provided*, That any self-insured employer who is a political subdivision of the state, a municipal corporation, or other public entity who is subject to audit by the state Auditor may, in lieu of an independent audit of financial condition, submit an audit made by the state Auditor which may be accepted by the department, in its discretion, if such audit is in sufficient detail to show the financial condition of such public agency for industrial insurance purposes. [Order 77-19, § 296-15-080, filed 9/26/77; Order 74-38, § 296-15-080, filed 11/18/74, effective 1/1/75; Order 74-29, § 296-15-080, filed 5/29/74, effective 7/1/74.]

WAC 296-15-090 Application of supplemental moneys in payment of compensation. Each employer authorized to self-insure the liabilities imposed by the industrial insurance law (Title 51 RCW) shall provide the Supervisor of Industrial Insurance of the Department of Labor and Industries with a statement of their current policy of applying sick leave, health and welfare insurance benefits or any other compensation in conjunction with or as a substitute for the time loss compensation required in RCW 51.32.090.

(a) Where a self-insurer maintains a person on full salary during a period of temporary total disability due to an injury or illness compensable under Title 51 RCW, a report shall be filed with the department in accordance with WAC 296-15-070.

This report shall indicate the amount of compensation the injured worker is entitled to when computed in accordance with RCW 51.32.060. The amount, so computed and reported, shall be included in the self-insurers total claim costs and therefore be included on the Quarterly Report of Self-Insured Employer (SIF #6) for the purpose of computing their administrative assessment. [Order 77-19, § 296-15-090, filed 9/26/77; Order 74-38, § 296-15-090, filed 11/18/74, effective 1/1/75.]

WAC 296-15-100 Permanent partial disability awards. Whenever a self-insuring employer receives an Order and Notice establishing a permanent partial disability (PPD) award, on behalf of a worker injured in its employment, the self-insurer shall make payment of the award without delay and in accordance with RCW 51.32.080(4).

When the amount of the award exceeds three times the average monthly wage in the state, as established at the date of the workers injury, a schedule of payments shall be prepared. Such schedule shall include all the following information:

- The total amount of the disability award.
 - The amount of the initial payment and the date such payment was made.
 - The amount of the remaining balance.
 - The amount of interest earned on the unpaid balance.
 - The date each subsequent payment will be made.
 - The amount of each subsequent payment until all moneys have been dispersed.
- A copy of this schedule shall accompany the initial payment to the claimant and a copy shall be forwarded

to the Supervisor of Industrial Insurance, in substantially the same form as set forth below.

**SCHEDULE OF FUTURE PAYMENTS
FOR THE
BALANCE OF THE PERMANENT PARTIAL
DISABILITY AWARD**

EMPLOYER: _____ Firm No. _____
 NAME OF CLAIMANT: _____
 ADDRESS: _____
 CLAIM#: _____

AMOUNT OF AWARD: _____
 INITIAL PAYMENT: _____
 UNPAID BALANCE: _____

DATE OF PAYMENT	UNPAID BALANCE	INTEREST	TIME LOSS SCHEDULE	AMT. OF PAYMENT
*	*	*	*	*

DATE PAID _____

[Order 77-19, § 296-15-100, filed 9/26/77; Order 74-38, § 296-15-100, filed 11/18/74, effective 1/1/75.]

WAC 296-15-110 Contract with a service organization. Every self-insuring employer utilizing a service organization independent of the self-insurers firm, to aid or participate in any manner in the administration of their responsibilities; including but not limited to: claims-handling, payment of compensation, accumulation of data and completion of required reports, (both quarterly and annual) or any other such administrative function; shall forward to the Supervisor of Industrial Insurance, a copy of the contract which exists between the two, or more, parties for such services: *Provided*, That any clause or clauses in such contract relating to the monetary consideration between the parties may be deleted: *Provided further*, That any provision in such contract relating to the monetary consideration which may increase or decrease such consideration on the basis of an increase or decrease of an employer's claims must be explained in detail and the Supervisor of Industrial Insurance may require the employer to supply an unaltered copy of the agreement where it appears reasonably necessary for the purpose of clarification.

Anytime a self-insurer elects to change service organizations, or in some manner change or modify the existing contract, a copy of such shall be forwarded to the Supervisor of Industrial Insurance. [Order 74-38, § 296-15-110, filed 11/18/74, effective 1/1/75.]

WAC 296-15-120 Log of occupational injuries and illnesses. Each self-insured employer shall, upon request, provide the Supervisor of Industrial Insurance, or his authorized representative, any or all information contained on the Log of Occupational Injuries and Illnesses (WISHERS #100) maintained in accordance with chapter 296-27 WAC. [Order 74-38, § 296-15-120, filed 11/18/74, effective 1/1/75.]

WAC 296-15-130 Administration of self-insurance. Every self-insurer shall conduct the administration of its self-insurance plan through the services of a person knowledgeable in the application of the Industrial Insurance Law and the Rules and Regulations for Self-Insurance.

The person or persons employed or retained as administrators, by either a self-insurer or an employer making application for certification as a self-insurer, must be able to:

(1) Demonstrate, in a manner satisfactory to the department, a thorough knowledge of the Industrial Insurance Laws and the Rules and Regulations for Self-Insurance, and

(2) Demonstrate, in a manner satisfactory to the department, an expertise in the adjudication of claims, and

(3) Have the authority and ability to make prompt payment of all compensation and assessments which may become due from such self-insurer; and

(4) Have the authority to make prompt decisions regarding claims adjudication and awards required by Title 51 RCW. [Order 74-38, § 296-15-130, filed 11/18/74, effective 1/1/75.]

WAC 296-15-140 Expense of out-of-state audit. The audit of self-insurance plans at locations outside the state of Washington, shall be at the expense of the self-insurer and the expense incurred in making such audit shall be paid by the self-insurer.

Such expenses shall be calculated at the usual and normal per diem and travel expense rates established by law and in effect at the time the expenses are incurred. [Order 74-38, § 296-15-140, filed 11/18/74, effective 1/1/75.]

WAC 296-15-145 Expense of withdrawn certificate audit. A self-insurer whose certificate has been withdrawn, whether surrendered voluntarily with the director's approval or involuntarily by order of the director, shall pay expenses incurred by the director, or his representative, in conducting an audit as may be required for the purposes of RCW 51.14.050 through 51.14.090. [Order 74-38, § 296-15-145, filed 11/18/74, effective 1/1/75.]

WAC 296-15-150 Safety violations. Each self-insuring employer must meet the requirements of RCW 51.14.030 to the satisfaction of the director, to obtain initial certification.

RCW 51.14.030(4) requires of an applicant employer that: "He has submitted to the department a description of the safety organization to be *maintained* by him within his establishment that indicates a record of accident prevention". (Emphasis added).

The maintenance of an adequate and effective safety organization, by a self-insured employer, is a continuing requirement.

The department may at any time require a self-insurer to report the accident prevention activity of the preceding twelve-month period. Such a report would include:

(1) The qualifications of the personnel administering their safety program.

(2) The adequacy of the program in relation to its success in accident prevention.

Failure of a self-insurer to maintain a safety program which indicates a record of accident prevention could be grounds for withdrawal of its certification. (RCW 51.14.080(1)). [Order 74-38, § 296-15-150, filed 11/18/74, effective 1/1/75.]

WAC 296-15-160 Order on compensable claims. In all cases the department shall issue an allowance, segregation or interlocutory order upon receipt of an SIF #5 from a self-insured employer, which reports the first payment of time loss compensation as required by WAC 296-15-070, unless a request for denial has been received on an SIF #4.

Interlocutory orders shall only be issued upon the application for such by a self-insurer. Such orders will be issued at the discretion of the department and only when substantiating documentation accompanies the request from the self-insurer.

Interlocutory orders shall be effective for a period of sixty days commencing on the date the self-insurer has knowledge or notice of the industrial injury or occupational disease. After which time an allowance or rejection order shall be issued.

All orders shall be issued in accordance with RCW 51.52.050. [Order 77-19, § 296-15-160, filed 9/26/77; Order 75-28, § 296-15-160, filed 8/29/75, effective 1/1/76.]

WAC 296-15-170 Cessation of business—Change of status. (1) A self-insurer that proposes to cease doing business entirely, or proposes to cease doing business in Washington, or proposes to dispose of, by sale or otherwise, the controlling interest of the business for which the certificate was issued shall immediately notify the department in writing of such proposed action and shall, upon request, surrender their certificate for cancellation.

(2) A self-insurer that amends its articles, charter or agreement of incorporation, association, co-partnership or sole proprietorship so as to change its identity or business structure or in any manner so as to materially alter its status as a self-insured employer as it existed at the time of the issuance of its certificate shall, within thirty days notify the department in writing of such action and provide the department with information regarding any change in the status of such self-insured employer. The department may, at its discretion, ask for copies of any documents deemed necessary regarding such transactions. [Order 75-28, § 296-15-170, filed 8/29/75, effective 1/1/76.]

WAC 296-15-180 Examinations for rating disability. In any case where a self-insured employer obtains information from a physician, other than the attending physician, for the purpose of rating or classifying disability, following the receipt of medical evidence that the worker's injury has become medically stabilized, such employer shall request from the attending physician whether or not he concurs in the examining physician's

conclusions. If the attending physician is not in agreement with such conclusions or refuses to give an opinion on such conclusions, all medical information in the records of the self-insured employer shall be forwarded to the department and the department may require additional medical examinations.

If the department determines further medical examination is needed, the self-insured employer shall be notified as to the name or names of such medical examiners for the purpose of promptly arranging the required examination. At the conclusion of the examination, the self-insurer shall immediately provide the department with a copy of the medical examiner's report.

All costs for such medical examinations and all reasonable expenses incurred by the injured worker shall be paid by the self-insurer to the extent required by RCW 51.32.110. [Order 75-28, § 296-15-180, filed 8/29/75, effective 1/1/76.]

WAC 296-15-190 Notification of rights and obligations. (1) Every self-insurer shall develop and maintain a comprehensive program designed to inform their employees about self-insurance and their rights and obligations. Such a program must include all present employees. Newly hired employees must be advised of their industrial insurance rights and obligations thoroughly during the first thirty calendar days of employment. The method and manner of advising employees of this program must have the approval of the department.

(2) This program shall include, but not be limited to the following:

(a) An explanation of the employees' industrial insurance rights and obligations.

(b) An explanation of the employer's claim processing system.

(c) A statement telling which employees are covered and under what circumstances coverage is provided.

(d) A complete explanation of the payment of all medical bills and the time loss compensation an injured worker can expect to receive if forced to lose time from work due to an injury, or occupational disease sustained at work. And as well, an explanation of the method utilized to periodically determine continued time loss certification.

(e) The extent of the coverage provided and the procedure utilized in closing a claim.

(f) An explanation of the law and rules of the department relating to the payment of medical expenses incurred by an on-the-job injury or occupational disease and as well the procedure for making an application for reopening a closed claim.

(g) An explanation of the role of the department in claims processing. Final orders are issued by the department in all cases, and any request for reconsideration of such orders should be directed to the department. Such explanation shall include a description of the method and manner of appealing orders of the department to the Board of Industrial Insurance Appeals. Further, the mailing address and phone number of the self-insurance offices shall be made known and available to all employees.

(h) An explanation of the supplemental pension fund assessment and the deduction made for that purpose.

(i) An explanation of the way an injured worker, or someone in his behalf, must file a claim. Such an explanation must include the statutory requirement that a claim be filed within one year of the date of the injury or within one year of knowledge of an occupational disease and also that the injured worker is responsible for filing the claim with his employer along with the certification of a licensed physician as stated in RCW 51.28.020.

(j) An explanation of both scheduled and unscheduled permanent partial disability (PPD) awards.

(3) A self-insurer shall designate a person or persons reasonably accessible to his work locations to whom an injured worker or any employee may direct questions about industrial insurance matters. This individual should have sufficient knowledge to answer routine questions and have the responsibility of seeking answers to more complex problems. [Order 75-28, § 296-15-190, filed 8/29/75, effective 1/1/76.]

WAC 296-15-200 Claims log—Evaluation. (1) Beginning January 1, 1976, each self-insurer shall maintain a log of all claims filed by any worker injured in their employ or any worker having contracted an occupational disease as a result of his employment with the self-insurer.

The claim log shall contain the following minimum information: The injured worker's name, the date of the injury or first knowledge of an occupational disease, the claim number assigned by the department and the date the claim is closed. Additional information may be recorded at the discretion of the employer.

(2) At the end of each calendar quarter, a review shall be made of all compensable claims in which time loss compensation has extended sixty days or more and there exists no apparent date for the injured worker's return to gainful employment.

In such cases where it appears reasonably certain the worker will be unable to return to gainful employment for the employer and rehabilitation or retraining may be necessary to effect the restoration of the worker to gainful employment, the employer shall schedule the worker for such medical examination and/or vocational evaluation and assessment as may be deemed appropriate in such worker's circumstance.

Copies of all medical reports, and determinations made by professionally competent people in the field of vocational evaluation and assessment, shall be provided to the department. [Order 77-19, § 296-15-200, filed 9/26/77; Order 75-28, § 296-15-200, filed 8/29/75, effective 1/1/76.]

WAC 296-15-210 Supplementation of temporary total disability compensation by self-insured employers. Self-insured employers shall make benefit payments to workers injured in their employ in accordance with RCW 51.32.090 and such increased payments as required by RCW 51.32.073.

When a self-insured employer is required to increase the amount of temporary total disability benefits being

paid an injured worker and where legislation provides for such increased benefits to be paid from the supplemental pension fund, the department will reimburse the employers in the amount of the increase.

Self-insured employers will be reimbursed from the supplemental pension fund upon their certification that payment was made of such increased benefits to qualified injured workers. Applications for reimbursement from the supplemental pension fund shall be filed quarterly on forms provided by the department. [Order 77-19, § 296-15-210, filed 9/26/77; Order 75-36, § 296-15-210, filed 10/28/75.]

WAC 296-15-21001 Form—SIF #3—Self-insured employer's notice of acceptance of claim.

SELF-INSURED EMPLOYER'S NOTICE OF ACCEPTANCE OF CLAIM

Claim No.: _____
Date of Notice: _____

Dear

This will notify you that your claim for benefits filed in reference to your injury or occupational disease of _____ has been accepted.

Should a dispute arise from the handling of your claim prior to your condition becoming fixed, you may request the Department of Labor and Industries to resolve such dispute.

When your condition becomes fixed, the Department of Labor and Industries will enter a closing order. If you are aggrieved by that order, you may request Departmental reconsideration, or you may appeal to the Board of Industrial Insurance Appeals.

(Firm Name)

By _____

cc: Director, Department of Labor and Industries Attending physician

SIF #3

[Order 71-15, Form SIF #3 (codified as WAC 296-15-21001), filed 12/1/71.]

WAC 296-15-21002 Form—SIF #4—Self-insured employer's notice of denial of claim.

SELF-INSURED EMPLOYER'S NOTICE OF DENIAL OF CLAIM

Claim No. _____
Date of Notice _____

Dear

This will notify you that your claim for benefits filed in reference to your injury or occupational disease of _____ has been received and investigated. The company hereby denies your claim for the reason(s) that

- 1. _____
- 2. _____
- 3. _____

The Department of Labor and Industries will send you an official order on the claim. If you are aggrieved by that order, you may request reconsideration by the Department of Labor and Industries, or you may appeal to the Board of Industrial Insurance Appeals.

(Firm Name)

By _____

cc: Director, Department of Labor and Industries Attending physician

SIF #4

[Order 71-15, Form SIF #4 (codified as WAC 296-15-21002), filed 12/1/71.]

WAC 296-15-21003 Form—SIF #5—Supplemental or final report on occupational injury or disease.

Claim No. _____
Soc. Sec. No. _____

SUPPLEMENTAL OR FINAL REPORT ON OCCUPATIONAL INJURY OR DISEASE

Check appropriate box:
Supplemental Final

A form must be filed at the following times on all claims:

- a. On the date the first time-loss compensation is paid.
- b. On the date the time-loss compensation is terminated, or the rate thereof changed.
- c. On the date a termination is requested.
- d. On extended claims at least every 180 days.

A medical report need not be submitted with your request for determination on noncompensable claims (medical only).

PLEASE ANSWER ALL QUESTIONS

Workman: _____

Present address: _____

Date of injury: _____

Date first compensation paid: _____

Marital status: Married Single Divorced
 Widowed

Number of dependent children under age 18: _____
(and/or under 21 in school)

Compensation paid from ----- through -----

Use (a) or (b)

(a) Temporary total disability at the rate of \$----- per day for ----- days totaling \$-----

(b) Temporary total disability at the rate of \$----- per month for ----- months and ----- days totaling \$-----

(For any temporary partial disability paid during this period, show dates and amounts paid and method of calculation based on claimant's earnings in the "Remark" section below.)

Date physician approved workman's return to work: -----

Date returned to work: -----

Will claimant be able to return to his former occupation:

Yes No Undetermined

Has medical treatment been completed: Yes No

Is condition medically fixed: Yes No

Is there any permanent impairment: Yes Undetermined

Medical report Attached Previously submitted X-Rays

Determination requested Yes No.

Names of treating physicians: -----

REMARKS: -----

X ----- Date: -----
Signature authorized representative

If this is a FINAL REPORT requesting determination, submit one copy to workman, one copy to Department of Labor & Industries.

If this is a SUPPLEMENTAL REPORT only, submit one copy to the Department of Labor & Industries.

If this is a SUPPLEMENTAL REPORT showing termination of compensation or change in the rate thereof, submit one copy to the workman and one copy to the Department of Labor & Industries.

SIF #5

[Order 71-15, Form SIF #5 (codified as WAC 296-15-21003), filed 12/1/71.]

WAC 296-15-220 Second injury fund. This rule is promulgated pursuant to RCW 51.16.120 and 51.44.040 and is intended to administrate the second injury fund requirements in RCW 51.16.120 and 51.44.040:

(1) There will be a separate accounting of state fund and self insurance transactions within the second injury fund. Self insurance second injury claim costs and contributions will be recorded in the self-insurers' account. State fund second injury claim costs and contributions will be recorded in the state fund account.

(2) Self-insurer contributions into the second injury fund will be made quarterly in amounts deemed sufficient to meet anticipated self-insurers' second injury claim costs. The self-insurer assessment base shall be total claim payments, as defined for administrative assessments. During the period of time before the first self-insurer second injury claim is approved, self-insurer contributions will be discontinued if the balance in the self-insurer account exceeds \$200,000.

(3) State fund payments into the second injury fund will be made from the accident fund and will be the difference between the total cost of all second injury fund claims and the contributions received from self-insurers. [Order 77-19, § 296-15-220, filed 9/26/77.]

WAC 296-15-230 Third party actions. When the injury to a worker is due to the negligence or wrong of a third person not in the same employ, the injured worker or beneficiary or the self-insured employer may elect to seek damages from the third party as provided by RCW 51.24.010.

(1) When such a third party action is undertaken, the self-insured employer shall report to the Department of Labor and Industries:

- (a) The name and claim number of the injured worker;
- (b) The date a judgment was rendered in the case, or;
- (c) The date of any agreement of parties to settle the action.

(2) The following documents are necessary to allow the adjudication of any claim in which a third party action has been taken:

- (a) A written indication of the election taken by the injured worker or beneficiary;
- (b) A copy of the court order establishing the total amount of the final judgment and the amount of attorney fees and costs involved, or;
- (c) A copy of any agreement of parties to settle the case, including the total amount of the agreed settlement;

(d) A statement of the total amount of attorney fees and costs involved, and;

(e) A statement of the employer's total costs, including temporary total disability, permanent partial disability and medical costs. [Order 77-19, § 296-15-230, filed 9/26/77.]

WAC 296-15-240 Procedure in cases appealed to the superior court. In all cases when any party has appealed to the superior court from a decision of the board of industrial insurance appeals in a case involving a self-insuring employer, or from the superior court to any appellate court, such a self-insurer shall promptly forward to the department copies of the notice of appeal, judgment, and such other information relevant to any such appeal to a superior or appellate court as the department may require. [Order 77-19, § 296-15-240, filed 9/26/77.]

Chapter 296-17 WAC

MANUAL OF RULES, CLASSIFICATIONS, RATES, AND RATING SYSTEM FOR WASHINGTON WORKMEN'S COMPENSATION INSURANCE

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-17-010 Seventy-five percent of average cost of pension claims—Industrial insurance base rates and medical aid rates. [Order 70-11, § 296-17-010, filed 11/30/70, effective 1/1/71; Order 69-5, § 296-17-010, filed 12/1/69; Order 68-8, § 296-17-010, filed 11/27/68, effective 1/1/69; General Order 1-67, filed 11/20/67, effective 1/1/68; General Order 1-66, filed 11/28/66, effective 1/1/67; General Order 1-65, filed 11/30/65, effective 1/1/66.] Repealed by Order 71-14, filed 12/1/71, effective 1/1/72.
- 296-17-020 Agricultural workers. [Order 68-9, § 296-17-020, filed 2/26/69, effective 4/1/69.] Repealed by Order 71-14, filed 12/1/71, effective 1/1/72.
- 296-17-030 Agricultural workers—Definition of casual employee. [Order 68-9, § 296-17-030, filed 2/26/69, effective 4/1/69.] Repealed by Order 71-14, filed 12/1/71, effective 1/1/72.
- 296-17-040 Agricultural workers—Payroll audit equivalent for hours of work. [Order 68-9, § 296-17-040, filed 2/26/69, effective 4/1/69.] Repealed by Order 71-14, filed 12/1/71, effective 1/1/72.
- 296-17-100 Premium payments—Quarterly reports. [Order 72-12, § 296-17-100, filed 7/18/72; Order 71-14, § 296-17-100, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-110 Determining accident fund premiums—Cost experience. [Order 72-19, § 296-17-110, filed 11/30/72, effective 1/1/73; Order 71-14, § 296-17-110, filed 2/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-120 Merit rating plan. [Order 72-19, § 296-17-120, filed 11/30/72, effective 1/1/73; Order 71-14, § 296-17-120, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-130 Credibility table for industrial insurance rates. [Order 72-19, § 296-17-130, filed 11/30/72, effective 1/1/73; Order 71-14, § 296-17-130, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-140 Average cost of pension claims—Effective date. [Order 71-14, § 296-17-140, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-150 Basis for determining medical aid premium. [Order 71-14, § 296-17-150, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-160 Qualifications for employer groups or workmen's compensation insurance. [Order 71-14, § 296-17-160, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-170 Dividends. [Order 71-14, § 296-17-170, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-180 Industrial insurance (accident fund) base rates and medical aid rates by class of industry. [Order 72-19, § 296-17-180, filed 11/30/72, effective 1/1/73; Order 72-12, § 296-17-180, filed 7/18/72; Order 71-14, § 296-17-180, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-190 Notice of employer inclusion—Reporting of hours. [Order 71-14, § 296-17-190, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-200 Minimum premium for elective adoption. [Order 71-14, § 296-17-200, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74.
- 296-17-210 Assessment for supplemental pension fund. [Order 73-16, § 296-17-210, filed 8/27/73; Order 72-16, § 296-17-210, filed 8/4/72; Order 71-14, § 296-17-210, filed 12/1/71, effective 1/1/72.] Repealed by Order 73-22, filed 11/9/73, effective 1/1/74. Second repeal by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-531 Classification 8-6. [Order 73-22, § 296-17-531, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-547 Classification 16-2. [Order 73-22, § 296-17-547, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-553 Classification 18-2. [Order 73-22, § 296-17-553, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-554 Classification 18-3. [Order 73-22, § 296-17-554, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-577 Classification 33-8. [Order 73-22, § 296-17-577, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-589 Classification 35-5. [Order 73-22, § 296-17-589, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-591 Classification 35-7. [Order 73-22, § 296-17-591, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-611 Classification 38-7. [Order 73-22, § 296-17-611, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-642 Classification 47-1. [Order 73-22, § 296-17-642, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-702 Classification 63-7. [Order 73-22, § 296-17-702, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-705 Classification 64-1. [Order 73-22, § 296-17-705, filed 11/9/73, effective 1/1/74.] Repealed by Order 75-38, filed 11/24/75, effective 1/1/76.
- 296-17-728 Classification 66-6. [Order 73-22, § 296-17-728, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-732 Classification 67-1. [Order 73-22, § 296-17-732, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-733 Classification 67-2. [Order 73-22, § 296-17-733, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.
- 296-17-734 Classification 67-3. [Order 73-22, § 296-17-734, filed 11/9/73, effective 1/1/74.] Repealed by Order 74-40, filed 11/27/74, effective 1/1/75.

WAC 296-17-310 General rules and instructions.

This section constitutes general rules and instructions for chapter 296-17 WAC. (1) **Purposes.** This chapter of the Washington Administrative Code, including classifications of risk, premium rates, the experience rating plan, and all other rules contained herein governing the use thereof, is herein referred to as the Manual. This Manual is promulgated by the Department of Labor and Industries pursuant to RCW 51.16.035. This Manual contains a formulation of the rules and regulations providing for occupational classifications, rates of premium, method of premium calculation and collection, and a rating system, consistent with recognized principles of workmen's compensation insurance. This Manual governs the department's underwriting of Workmen's Compensation Insurance and assessment of other monetary obligations, under the Industrial Insurance Law of the State of Washington, Title 51 RCW.

(2) **Premium Payments - Quarterly Reports.** Each employer shall, upon such forms as prescribed by the department, prior to the last day of January, April, July and October of each year, pay to the department for the preceding calendar quarter, for the accident fund, and for the medical aid fund, a certain number of cents for

each man hour or fraction thereof worked by the workman in his employ except when the rules of this Manual provide for a different method of premium computation. The director may promulgate, change and revise such rates at such times as necessary, according to the condition of the accident and medical aid funds, and assign rates as appropriate to employers who voluntarily seek coverage under the elective adoption provisions of the law.

(3) **Determining Accident Fund Premium.** The amounts to be paid into the accident fund shall be determined as follows: The department shall determine a Manual premium rate for each classification which shall not be inadequate, excessive or unfairly discriminatory, taking into consideration past and prospective costs in each classification and the financial condition of the accident fund as a whole.

Every employer shall pay into the accident fund at the Manual premium rate unless such employer meets the requirements for the experience rating plan provided elsewhere in this Manual, in which event such employer's premium rate for the accident fund shall be paid according to his experience modification as determined under the experience rating plan.

(4) **Basis for Determining Medical Aid Premium.** The amounts to be paid into the medical aid fund shall be determined as follows: The department shall determine a basic medical aid rate for each classification which shall not be inadequate, excessive or unfairly discriminatory, taking into consideration past and prospective costs in each classification and the financial condition of the medical aid fund as a whole.

Every employer shall pay into the medical aid fund at the basic premium rate only, and the experience rating plan shall not apply to medical aid rates.

(5) All section captions or titles or catch lines used in this Manual, chapter 296-17 WAC, do not constitute any part of these rules. [Order 77-27, § 296-17-310, filed 11/30/77, effective 1/1/78; Order 75-28, § 296-17-310, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-310, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-310, filed 11/9/73, effective 1/1/74.]

WAC 296-17-320 General definitions. For the purpose of interpretation of this Manual, chapter 296-17 WAC, the following terms shall have the meanings given below:

(1) "Workmen's Compensation" shall mean the obligation imposed upon an employer by the Industrial Insurance Laws of the State of Washington, to insure the payment of benefits prescribed by such laws.

(2) "Risk" shall mean and include all insured operations of one employer within the State of Washington.

(3) "Classification" means a classification of occupations, employments, industries and businesses contained in the listing of Classifications contained in this Manual.

(4) "Exposure" means workman hours, workman days, payroll or other measure of the extent to which an employer's workmen have been exposed to the hazards of a particular classification of employment.

(5) "Rate" means the amount of premium for each unit of exposure. All rates are rates per workman hour except where specifically provided otherwise in this Manual.

(6) "Premium" means the sum derived from the application of the rates to the exposures in each classification, after application of any duly authorized experience modification, except where the rules of this Manual indicate otherwise.

(7) Unless the context indicates otherwise, the words used in this Manual shall have the meanings given in Title 51 RCW. [Order 73-22, § 296-17-320, filed 11/9/73, effective 1/1/74.]

WAC 296-17-330 Officers or members of a corporate employer. As used in this Manual, the terms "member" and "officer" are synonymous and mean the executive officers elected or appointed in accordance with the charter and by-laws of such corporation.

Any executive officer of a corporate employer desiring to obtain coverage (under the authority of RCW 51.32-.030, as now or hereafter amended) shall give notice in writing and supply information required on a form prescribed by the department.

Any executive officer on whom coverage has been elected shall be included in the corporation's statement of payroll (on a form prescribed by the department), and premium shall be charged thereon. For the purposes of premium computation not less than 40 workman hours of employment per week shall be reported for any executive officer on whom coverage has been elected. Any exception granted to the foregoing number of hours to be reported per week on the quarterly report shall be dependent upon submission to the department of sufficient and satisfactory evidence in support of such exception. Any such evidence to support an exception to be considered sufficient and satisfactory must be capable of verification on any audit that may be conducted by the department.

The entire number of hours so developed of each executive officer shall be assigned to a classification in the same manner as though the person were not an executive officer, except in case of aircraft operations. The hours of an executive officer who is a pilot or member of the crew on any aircraft used in the employer's business, shall be assigned to the appropriate aviation class and where an "aircraft operation" classification applies, the entire number of hours of the executive officer shall be assigned to this classification unless the records of the employer clearly indicate the hours flying which are performed by such executive; in such event, only the hours which such executive is engaged in flying shall be assigned to the aircraft operation classification. The hours in which no flying was done shall be assigned to that classification which would otherwise apply; provided, however, that no part of the executive officer's hours shall be assigned the "clerical office" classification. [Order 75-28, § 296-17-330, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-330, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-330, filed 11/9/73, effective 1/1/74.]

WAC 296-17-340 Sole proprietors and partners.

Any individual employer (sole proprietor or partner) desiring to obtain coverage (under the authority of RCW 51.32.030, as now or hereafter amended) shall give notice in writing on a form prescribed by the department. Any such employer so covered shall be assigned without division to the governing classification; provided, in case of the employer conducting a separate enterprise, the "Multiple Enterprise" rule as set forth in this Manual shall apply.

In case of the employer conducting any aircraft operations, the hours of the sole proprietor or partner who is a pilot or member of the crew on any aircraft used in the employer's business, shall be assigned to the appropriate aviation class and where an "aircraft operation" classification applies, the entire number of hours of the employer shall be assigned to this classification unless the records of the employer indicate the hours in which flying is performed by such employer; in such event, only the hours such employer is engaged in flying shall be assigned to the aircraft operation classification. The hours in which no flying was done shall be assigned to the governing classification. If "aircraft operations, N.O.C.," as defined in this Manual, is the governing classification, the hours in which no flying was done shall be assigned to the aircraft operations, N.O.C., ground crew classification.

Each sole proprietor or partner shall report to the department quarterly not less than 40 hours of employment per week for the purposes of premium computation. Any exception granted to the foregoing number of hours to be reported per week on the quarterly report form shall be dependent upon submission to the department of sufficient and satisfactory evidence in support of such exception. Any such evidence to support an exception to be considered sufficient and satisfactory must be capable of verification on any audit that may be conducted by the department. [Order 75-28, § 296-17-340, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-340, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-340, filed 11/9/73, effective 1/1/74.]

WAC 296-17-350 Minimum premiums—Assumed workman hours. A minimum premium is the lowest amount of premium to be paid by an employer and is also the basis for determining premium computation for workmen for whom an assumed number of workmen hours must be, and hereby, is established:

(1) **Minimum Premium.** Except as otherwise provided in this chapter, every employer shall be liable for a premium not less than ten dollars for any calendar quarter regardless of number of workman hours reported.

(2) **Minimum Premium for Elective Adoption.** Any employer having in his employ any person exempt from mandatory coverage under the provisions of RCW 51.12.020 and whose application for coverage under the elective adoption provisions of RCW 51.12.110 is accepted by the director, shall have a minimum premium rate for such employer's applicable class based upon not less than 40 workman hours for each month, until such time as elective adoption coverage is cancelled: *Provided*, That the minimum premium rate as specified above

shall not apply to agricultural workers obtaining coverage under this rule and the elective adoption provisions of RCW 51.12.110.

(3) **Apartment House, Apartment Hotel, Motor Court and Similar Operations.** Resident managers, caretakers or other similar occupations who are employed for irregular periods and whose compensation is for a stipulated sum in money or a substitute for money shall be reported for the purpose of calculation of premiums, each three dollars of compensation in money or a substitute for money shall represent one workman hour: *Provided*, That the employer shall not be required to report in excess of 40 hours per week for each person so employed.

(4) **Commission Salesman.** Commission salesmen are to be reported for premium purposes at a minimum of assumed workman hours of not less than eight workman hours a day for part-time employment, or not less than 40 workman hours per week for full-time employment: *Provided*, That the assumed eight workman hours daily for part-time employment will apply only if the employer's books and records are maintained so as to show separately such person's actual record of employment.

(5) **Salaried Personnel.** Salaried personnel for the purposes of this chapter means persons whose compensation is not governed by the number of hours devoted to employment for his employer. Employers having salaried personnel in their employ shall for the purpose of premium calculation report assumed workman hours based upon 40 workman hours for each week in which any duties of salaried personnel are performed: *Provided*, That salaried personnel, as defined by the foregoing, who are not regularly and continuously employed by the employer may for the purpose of premium calculation compute premiums in accordance with the piece worker rule, subsection (6) of this section: *Provided further*, if the employer is a political subdivision the 40 hours per week may be substituted by assuming 160 hours per month for each month in which employees of such political subdivisions receive a salary.

(6) **Piece Workers.** Employees whose compensation is based upon the accomplishment of a number of individual tasks whether computed on the number of pounds, items, pieces, or otherwise, the employer shall for the purpose of premium calculation assume each two dollars of earnings of each employee as representing one workman hour: *Provided*, That if the average rate of compensation for the applicable classification is at least \$3.00 but less than \$3.50 per workman hour the assumed amount shall be \$3.00 of earnings as representing one workman hour, and on a progressive basis, if the average compensation is at least \$3.50 but less than \$4.00 the assumed amount shall be \$3.50 of earnings as representing one workman hour, etc. The records of the department as compiled for the preceding fiscal year ending June 30, shall be the basis for determining the average rate of compensation for each classification: *Provided further*, That if the employer maintains books and records to show separately the hours employed for each workman in his employ engaged in piece work then such actual workman hours shall be reported for the purpose of premium calculation.

(7) **Noncontact Sports Teams.** All employers having personnel in their employ as defined under WAC 296-17-745 shall for the purpose of premium calculations, report assumed workman hours based upon 40 workman hours for each week in which any duties are performed.

(8) All employers having personnel in their employ as defined under WAC 296-17-739 shall, for the purpose of premium calculations, report assumed workman hours based upon one hour for each mount in each horse race; professional drivers shall report workman hours based upon one hour for each heat or race of any racing event; provided, that any day such personnel do not ride or drive in a race, the premium calculation shall be made by assuming 3 worker hours for any day in which duties are performed. [Order 77-27, § 296-17-350, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-350, filed 5/31/77; Order 76-18, § 296-17-350, filed 5/28/76, effective 7/1/76; Order 75-28, § 296-17-350, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-350, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-350, filed 11/9/73, effective 1/1/74.]

WAC 296-17-351 Periodic review of cash deposit or surety bond. The supervisor of industrial insurance through the audit and collection section of the division of industrial insurance will periodically review the cash deposit or surety bond of all employers and all new employers or employers resuming operations pursuant to RCW 51.16.110 upon the basis of the most current four quarterly reports which report workman hours for the purpose of ascertaining whether the initial estimate of premium for three calendar months to establish the amount of cash deposit or surety bond is adequate to insure the payment of premiums due or to become due to the accident or medical aid funds. The average amount of premium during the period covered by the four quarterly reports, shall be utilized to determine the adequacy of the initial cash deposit or surety bond to secure the payment of premiums.

If the review discloses that the initial estimate of premium by the employer for the three calendar months used as the basis of the estimate for the amount of cash deposit or surety bond is less than the average amount of premium of the four quarterly reports reviewed, then requests will be made of such employer to increase the cash deposit or surety bond to the sum equivalent to the average premium amount for the four quarterly reports reviewed: *Provided*, That if the cash deposit or surety bond is equal to 75 percent, or more, of the average amount of premium of the four quarterly reports reviewed, the cash deposit or surety bond will be deemed to be sufficient.

If the review discloses that the initial estimate of premium by the employer for three calendar months used as the basis of the estimate for the amount of cash deposit or surety bond is more than the average amount of premium for the four quarterly reports reviewed, then a refund will be made to such employer in the amount of the difference between the initial cash deposit and the amount determined to be adequate to secure the payment of premiums, if such refund exceeds 25 percent of the cash deposit, or such employer will be advised of the

amount of the reduction in the penal sum of the surety bond. [Order 76-36, § 296-17-351, filed 11/30/76; Order 74-29, § 296-17-351, filed 5/29/74, effective 7/1/74.]

WAC 296-17-352 Audits. An audit of the employer's books, records and payrolls performed pursuant to the authority contained in RCW 51.48.040 shall include, but not be limited to:

(1) An audit to determine whether an employer engaged in a business or trade has employment subject to the Industrial Insurance Laws.

(2) A visual inspection of the employer's workplace or places for the purpose of determining appropriate classifications in accordance with the Industrial Insurance Laws and rules as set forth in chapter 296-17 WAC.

(3) Audits containing a complete and detailed examination of the employer's books and records for a specific period to establish the reporting of the employer's payroll in accordance with the Industrial Insurance Laws and the rules as set forth in chapter 296-17 WAC, and as well, chapter 296-15 WAC in the event the employer has been certified a self-insurer.

Except as otherwise provided in this rule any audit time period may be less than, but will not exceed, eleven calendar quarters which will consist of the two calendar years immediately preceding the year in which the audit is commenced and including any expired calendar quarters of that year: *Provided*, That in the event an employer refuses access to the books and records upon request, the Department may at its discretion commence the audit time period with the calendar year as though the books and records had been made available at the time of the initial request: *Provided further*, That an employer certified to self-insure pursuant to the authority contained in chapter 51.14 RCW, shall be subject to such audit as deemed necessary to guarantee its compliance with the Industrial Insurance Laws and Rules and Regulations for Self-Insurers. Such an audit may not require the review or visual inspection to determine classifications as outlined in (2) above. [Order 76-36, § 296-17-352, filed 11/30/76; Order 76-18, § 296-17-352, filed 5/28/76, effective 7/1/76.]

WAC 296-17-360 Assignment of classification by analogy. The Classification Section of this Manual contains a listing of classifications for most occupations, employments, industries and businesses.

Any enterprise or operation which is not described by such classifications shall be assigned to the classification or classifications most analogous from the standpoint of process and hazard. The limitations and conditions of the classification or classifications so assigned and all Manual rules pertaining thereto shall be applicable. [Order 73-22, § 296-17-360, filed 11/9/73, effective 1/1/74.]

WAC 296-17-370 Governing classification. The Governing Classification of a risk is defined as that classification, other than the Standard Exception Classifications, which carries the largest number of workman

hours. [Order 73-22, § 296-17-370, filed 11/9/73, effective 1/1/74.]

WAC 296-17-380 Single enterprise. If the employer's business, conducted at one or more locations, consists of a single operation or a number of separate operations which normally prevail in the business described by a single Manual classification, that single classification which most accurately describes the entire enterprise shall be applied. Division of workman hours shall be made as provided hereinafter in respect to Standard Exceptions and General Exclusions. No division of workman hours shall be permitted in respect to any other operation even though such operation may be specifically described by some other classification, unless the applicable classification phraseology or other Manual provision specifically provides for such division of workman hours. [Order 73-22, § 296-17-380, filed 11/9/73, effective 1/1/74.]

WAC 296-17-390 Multiple enterprises. If the employer's business includes a separate operation which does not normally prevail in the business described by the governing classification, such operation shall be separately rated in accordance with the following rules:

(1) If such separate operation is described by a classification which carries a rate either equal of or higher than the rate for the governing classification, division of workman hours shall be required, provided that:

- (a) The operation is not described by any of the General Inclusions;
- (b) The division is not contrary to the classification phraseology;
- (c) The division is not contrary to the provisions of any other rules of the Manual.

(2) If such separate operation is described by a classification which carries a rate lower than the rate for the governing classification, division of workman hours shall be permitted only when the conditions as provided above in subdivisions (a), (b) and (c), of subsection (1) are met. [Order 73-22, § 296-17-390, filed 11/9/73, effective 1/1/74.]

WAC 296-17-400 Mercantile operations. For mercantile operations the classification shall be separately determined for each separate location which is conducted as a separate enterprise without interchange of labor. [Order 73-22, § 296-17-400, filed 11/9/73, effective 1/1/74.]

WAC 296-17-410 Division of single employee's workman hours. The workman hours of any one employee may be divided between two or more classifications, provided the employer has maintained complete and accurate records supported by original time cards or time book entries which show separately both by individual employee and in summary by operations performed the workman hours of such employees, except such division SHALL NOT BE ALLOWED:

(1) In connection with the Standard Exception Classifications which must be rated in accordance with the specific rules under WAC 296-17-440.

(2) If the division is contrary to the classification phraseology.

If the employer fails to keep complete and accurate records as provided in this rule, the entire number of workman hours of the employee shall be assigned to the highest rated classification representing any part of his work. Division of workman hours by means of percentages, averages, estimates, or any basis other than specific time records, shall not be accepted by the department. [Order 75-28, § 296-17-410, filed 8/29/75, effective 10/1/75; Order 73-22, § 296-17-410, filed 11/9/73, effective 1/1/74.]

WAC 296-17-420 General inclusions. The classifications in this Manual, other than standard exceptions, include the operations listed in this section and referred to as general inclusions, unless specifically excluded by the language of the Manual classification. (1) Aircraft travel by employees, other than members of the flying crew, including employees whose workman hours are assigned to the standard exception classifications.

(2) Commissaries and restaurants except in connection with construction, erection, lumbering or mining operations.

(3) Manufacture of containers, such as bags, barrels, bottles, boxes, cans, cartons or packing cases.

(4) Plant hospitals or dispensaries.

(5) Maintenance or ordinary repair of employer's buildings or equipment when performed by employees of the employer.

(6) Printing or lithographing.

(7) Drivers.

(8) Transportation of equipment and material by job contractor. [Order 73-22, § 296-17-420, filed 11/9/73, effective 1/1/74.]

WAC 296-17-430 General exclusions. Subject to division of workman hours rules, all classifications, including standard exceptions, exclude the following operations referred to as general exclusions, unless specifically included by the language of the Manual, or the employer is a political subdivision. Operations described by general exclusions shall require division of workman hours notwithstanding that the classification wording may include the term "all" as in such phrases as "all employees", "all operations", etc.:

(1) Aircraft operation — all members of the flying crew.

(2) Maintenance or repair work if performed by contractors and all new construction or alteration work whether done by the employer's workmen or by contractors.

(3) Musicians and entertainers having no other duties. [Order 74-40, § 296-17-430, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-430, filed 11/9/73, effective 1/1/74.]

WAC 296-17-440 Standard exceptions. The following operations referred to as Standard Exceptions are subject to division of workman hours in connection with all other classifications regardless of directional phrases

beginning with "all employees" or "all operations" except those which specifically provide for the inclusion of certain Standard Exceptions. (Use of the words "clerical office" shall also include draftsmen and use of the word "salesmen" shall also include collectors and messengers.) The Standard Exceptions are:

(1) Clerical office employees are defined as those employees whose duties are confined to keeping the books or records of the employer, or conducting correspondence or who are engaged wholly in office work where such books or records are kept or where such correspondence is conducted, having no other duty of any nature in or about the employer's premises. If any clerical office employee is exposed to any operative hazard of the business, his entire hours shall be assigned to the highest rated classification of work to which he is exposed. The classification shall be applied only to persons as herein described who are employed exclusively in separate buildings or on separate floors of buildings or in departments on such floors which are separated from all other work places of the employer by structural partitions and within which no work is performed other than clerical office duties as defined in this paragraph.

(2) Draftsmen will be considered to be clerical office employees and are defined as those employees whose duties are limited to office work only and who are engaged strictly as draftsmen in such a manner that they are not exposed to the operative hazard of the business. If any draftsman is exposed to any operative hazard of this business, his entire hours shall be assigned to the highest rated classification of work to which he is exposed.

(3) Salesmen, collectors, messengers, appraisers—outside are defined as those employees engaged principally in any such duties away from the premises of the employer. It does not apply to any such employee whose duties include delivery, even though they may also collect or solicit.

With the exceptions of occupations falling within any class that specifically includes clerical office, inside draftsmen or salesmen, the following designated occupation classes shall apply.

Class 49-4 Clerical office employees, inside draftsmen.

Class 63-3 Salesmen: Defined as outside or away from the premises and including collectors, messengers, appraisers, solicitors, and claims adjusters.

Class 63-1 Automobile salesmen.

Class 63-2 Door to door salesmen. [Order 73-22, § 296-17-440, filed 11/9/73, effective 1/1/74.]

WAC 296-17-450 Special agricultural class interpretations. Farming in Classifications 48-2 through 48-6 and 48-8 will include farm labor by contractors and farm machinery operations by contractors.

Any employee not regularly and continuously employed by an employer in agricultural labor whose cash remuneration paid by or due from any one employer in that calendar year for agricultural labor is less than one hundred fifty dollars (\$150.00) is not within the mandatory coverage of Title 51 RCW. The Department will consider an agricultural employee as being "regularly

and continuously employed" as those terms are used in RCW 51.12.020, subsection (6) in the case of any employee who as of January 1 of any calendar year is carried on the payroll of the employer and who is employed by the employer in agricultural labor and was carried on the employer's payroll as of December 31 of the preceding calendar year and has exceeded one hundred fifty dollars (\$150.00), of earnings during such preceding calendar year. Coverage for all exempt agricultural employees is available upon request as provided under RCW 51.12.110.

To qualify for a separate rating of ground hand-picking or any other separation of agricultural classes, separate and distinct payroll records of such operations will be required.

If a single establishment or work comprises more than one of classifications 48-2 through 48-6 and 48-8, the premiums shall be computed according to the payroll for operations of each classification. The Department in its discretion may assess a single rate of premium for an agricultural establishment when a substantial portion of the operation falls within one classification, and in such cases, the entire operation will be required to be reported in such largest classification. *Provided*, That under no circumstances will the hand-picking classification (48-6) apply for the purpose of single rating of an entire establishment. [Order 74-40, § 296-17-450, filed 11/27/74, effective 1/1/75; Order 74-29, § 296-17-450, filed 5/29/74, effective 7/1/74; Order 73-22, § 296-17-450, filed 11/9/73, effective 1/1/74.]

WAC 296-17-460 Classification phraseology. (1) **N.O.C.** This expression is an abbreviation of the words "not otherwise classified". No classification so qualified shall be applied in any case where any other Manual classification more accurately describes the enterprise or where the language of any Manual classification so qualified prescribes other treatment.

(2) **Including.** If a classification carries a descriptive phrase "including" certain operations, division of workman hours shall not be made for such operations even though they may be specifically described by some other classification of this Manual or may be conducted at a separate location.

(3) **All.** If a classification carries a descriptive phrase beginning with "all" as in the expression "all employees", "all other employees", "all operations", "all work to completion", division of workman hours shall not be made for any employees or operation (other than the Standard Exceptions or General Exclusions), without regard to the location of such operations, except for an operation not incidental to and not usually associated with the enterprise described by such a classification.

(4) **Or.** The word "or" when used in the classification phraseology shall be understood to have the same meaning as though expressed "and/or". [Order 73-22, § 296-17-460, filed 11/9/73, effective 1/1/74.]

WAC 296-17-501 Classification 1-1.

Highway, street and road construction, N.O.C., includes all operations such as grading, grubbing, clearing, surfacing, striping, guard rails, highway dividers,

highway lighting and highway signs installation, excludes bridges and logging roads. See Class 2-1 (WAC 296-17-508) and/or Class 69-2 (WAC 296-17-747)

Airports, landing strips, runways and taxi ways, construction and repair

Excavation, N.O.C.

Grading, N.O.C. – including land leveling and grading of farm lands by contractor

Land clearing, N.O.C., firefighting, N.O.C.

Coaxial cable and conduit underground construction, maintenance and repair – including use of automatic cable laying equipment and including television cable, N.O.C.

Diking, N.O.C.

Ditches and canals, N.O.C.

Pipelaying, including underground irrigation systems, N.O.C.

Pit, crusher and bunker operations in connection with road, street and highway construction

Railroads, construction, maintenance and repair, N.O.C., including dismantling. Excludes bridges and log railroads

Retaining walls with road, street and highway construction, N.O.C.

Trenches and sewers, construction, N.O.C.

Tunnels and approaches including lining

Humus or peat digging – including humus or peat dealers

Sand or gravel, or shale digging

Oil spill clean-up involving diking and/or ditching work will be rated with diking, N.O.C.

Slope grooming and forest trail construction will be rated with land clearing

Cofferdam work and shaft sinking and well digging with caisson will be rated under tunnels and approaches, except where subject to dam construction classification

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 76-36, § 296-17-501, filed 11/30/76; Order 75-38, § 296-17-501, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-501, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-501, filed 11/9/73, effective 1/1/74.]

WAC 296-17-502 Classification 1-2.

Concrete and asphalt construction, N.O.C. – including concrete sawing, drilling and pumping

Concrete culverts or other types with span of 12 feet or less

Sewage disposal plants, construction

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 76-36, § 296-17-502, filed 11/30/76; Order 73-22, § 296-17-502, filed 11/9/73, effective 1/1/74.]

WAC 296-17-503 Classification 1-3.

Drilling, N.O.C.

For drilling done in connection with construction work, see construction class

Geophysical exploration, seismic

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 74-40, § 296-17-503, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-503, filed 11/9/73, effective 1/1/74.]

WAC 296-17-504 Classification 1-4.

Dredging, N.O.C.

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 73-22, § 296-17-504, filed 11/9/73, effective 1/1/74.]

WAC 296-17-505 Classification 1-5.

Fence, all types, erection and repair – including wire mesh installation for slope protection.

[Order 73-22, § 296-17-505, filed 11/9/73, effective 1/1/74.]

WAC 296-17-506 Classification 1-6.

Tree topping and pruning, N.O.C., includes spraying or fumigating in connection with tree topping, repairing or trimming.

[Order 73-22, § 296-17-506, filed 11/9/73, effective 1/1/74.]

WAC 296-17-507 Classification 1-9.

Reinforcing steel installation – placing for concrete construction

Reinforcing steel installation in connection with the construction of tunnels, cofferdams, caissons, dams, bridges, and steel erection shall be assigned to the classification describing the construction with which such reinforcing steel installation is connected.

[Order 73-22, § 296-17-507, filed 11/9/73, effective 1/1/74.]

WAC 296-17-508 Classification 2-1.

Bridge, trestle, overhead crossing, viaducts, construction, maintenance and repair including the foundations and approaches

Breakwater, jetty, levee, construction, maintenance and repair

Bulkhead retaining walls, construction, maintenance and repair, riprapping – all water hazard

Concrete culverts or other types over 12 feet

Undercrossings and approaches – including lining

Debris removal and other work with water hazard, N.O.C., will be rated under bulkhead construction with water hazard

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 73-22, § 296-17-508, filed 11/9/73, effective 1/1/74.]

WAC 296-17-509 Classification 2-2.

Pile driving, concrete piles, N.O.C.

Wharf, pier, dock and marine railway, construction, maintenance and repair and subaqueous work, N.O.C.

Diving operations will be rated with subaqueous work, N.O.C.

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 76-36, § 296-17-509, filed 11/30/76; Order 73-22, § 296-17-509, filed 11/9/73, effective 1/1/74.]

WAC 296-17-510 Classification 3-1.

Chemical spraying and fumigating

Landscaping and lawn care

Landscape gardening will also include sodding, seeding, planting, and related landscape work necessary for the beautification of median strips and road sides

Lawn-type sprinkler systems installation when done by landscaping contractor as part of landscaping contract will be rated under landscaping and lawn care.

[Order 76-36, § 296-17-510, filed 11/30/76; Order 73-22, § 296-17-510, filed 11/9/73, effective 1/1/74.]

WAC 296-17-511 Classification 3-2.

Brick and slate work, N.O.C.

Masonry, N.O.C., including chimney and fireplace construction.

[Order 75-38, § 296-17-511, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-511, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-511, filed 11/9/73, effective 1/1/74.]

WAC 296-17-512 Classification 3-6.

Plumbing, N.O.C., sewer pipe cleaning

Boilers, N.O.C., installation, service and repair

Sprinkler installation, lawn-type and automatic

Steam pipe, boiler, etc., covering insulation

Boiler scaling and tank erection within buildings will be rated with boilers, N.O.C. installation

Roto roter service companies will be rated under sewer pipe cleaning

This class includes shop operations.

[Order 74-40, § 296-17-512, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-512, filed 11/9/73, effective 1/1/74.]

WAC 296-17-513 Classification 3-7.

Ventilating, air conditioning and refrigeration systems, installation, service and repair, N.O.C.

Furnaces, installation, service and repair

Heating systems, installation, service and repair

See Class 34-4 (WAC 296-17-582) for sheet metal shop work.

[Order 73-22, § 296-17-513, filed 11/9/73, effective 1/1/74.]

WAC 296-17-514 Classification 4-1.

Cleaning, washing, sand blasting buildings, N.O.C., including shop operations.

[Order 73-22, § 296-17-514, filed 11/9/73, effective 1/1/74.]

WAC 296-17-515 Classification 4-2.

Window cleaning

Excludes domestics, janitors and handymen regularly employed for other purposes; includes the actual time of all workmen employed by contract janitorial service companies while engaged in window washing.

[Order 73-22, § 296-17-515, filed 11/9/73, effective 1/1/74.]

WAC 296-17-516 Classification 4-3.

Erection, painting, repair and maintenance or removal of signs, including shop

Sign painting or lettering outside buildings or structures, N.O.C., including shop operations

Street and building decorating, hanging flags or bunting.

[Order 74-40, § 296-17-516, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-516, filed 11/9/73, effective 1/1/74.]

WAC 296-17-517 Classification 5-2.

Rug, linoleum, tile and other types of floor or drain-board covering installation.

[Order 75-38, § 296-17-517, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-517, filed 11/9/73, effective 1/1/74.]

WAC 296-17-518 Classification 5-3.

Kitchen exhaust, smoke hood cleaning

Safes and vaults, installation and removal

Venetian blinds and shades, installation

Advertising display service for stores

Drapes or curtain installation

Chimney cleaning - residential

Pump installation or repair

Chimney cleaning - not residential.

[Order 73-22, § 296-17-518, filed 11/9/73, effective 1/1/74.]

WAC 296-17-519 Classification 5-4.

Wallboard taping and texturing

Painting bridges, including incidental preparation work

Painting, decorating or paperhanging, N.O.C., including incidental preparation, including shop

Waterproofing, N.O.C. Excludes roofing or subaqueous work

Painting, coating or cleaning oil or gas storage tanks and beer vats

Painting towers, smokestacks and steel or iron structures.

[Order 76-36, § 296-17-519, filed 11/30/76; Order 73-22, § 296-17-519, filed 11/9/73, effective 1/1/74.]

WAC 296-17-520 Classification 5-5.

Construction, erection, alteration or repair of private residences

Construction, erection, alteration or repair of buildings, N.O.C.

Wrecking or demolition of buildings

Building raising or moving and underpinning

Roofwork, all types, construction and repair

Glass installation away from shop

Wallboard installation, plastering, stuccoing and lathing

Insulation or soundproofing materials installation, N.O.C.
 Fixtures – cabinets, counters, drainboards, mantels, etc. installation
 Weather strip installation
 Door, door frame, sash, overhead door, siding installation and carpentry, N.O.C.
 Elevator door bucks – installation
 Fire escapes and awnings – installation, erection, repair and removal outside buildings
 Decorative metal shutters – installation, erection and removal – no buntings
 Scaffolds, hod hoists, concrete and cement distributing towers, sidewalk bridges and construction elevators, installation or removal
 Debris cleaning and removal and building clean-up after construction
 All building industry operations, which include all field activities in connection with excavating and backfilling, erection, alteration, repair, or demolishing of any building or buildings, or part thereof or appurtenance thereto. This class will apply to all work performed by the prime building contractor. Work performed by contractors other than the prime contractor is subject to this class, with the exception of the excavating contractors, electrical contractors, plumbing contractors, heating contractors, painting contractors, steel erection contractors, masonry contractors, and concrete contractors. This class excludes a person employing help by day labor to perform work on his own home. See Class 48-7 (WAC 296-17-648)
 See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 76-36, § 296-17-520, filed 11/30/76; Order 75-38, § 296-17-520, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-520, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-520, filed 11/9/73, effective 1/1/74.]

WAC 296-17-521 Classification 5-8.

Erection, maintenance and repair radio, television, water towers and towers, N.O.C.
 Smokestacks, structural iron or steel framework, erection, maintenance and repair
 Windmills, all types, erection, maintenance and repair, silo erection
 Crane or derrick installation
 Oil still or refinery construction
 Blast furnace and metal burners construction
 Exterior tanks – all types – erection
 Overhead transmission lines, including poles or towers, erection, maintenance, repair by contractor
 Elevated railway, tram, lift, etc., construction, maintenance and repair
 This class includes erection of skeletons for pillars, posts and like columns
 This class includes all excavations, foundation work, and includes dismantling, and repairing of above types of structures
 See Class 52-6 (WAC 296-17-675) for permanent yard operations.
 [Order 76-36, § 296-17-521, filed 11/30/76; Order 75-

38, § 296-17-521, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-521, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-521, filed 11/9/73, effective 1/1/74.]

WAC 296-17-522 Classification 6-1.

Electrical wiring in buildings, and electrical wiring, N.O.C.
 Intercom or audio call box, installation, service or repair
 Meat slicer or grinder – service and repair
 Electrical alarm systems, business machine systems – installation in buildings
 Electrical machinery and auxiliary apparatus installation and repair – including incidental wiring
 Erection of temporary floodlights – search light operation mounted on and generated by truck
 Permanent flood lighting stadiums and parks
 Television cable installation in buildings by contractor.
 [Order 75-38, § 296-17-522, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-522, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-522, filed 11/9/73, effective 1/1/74.]

WAC 296-17-523 Classification 6-2.

Elevator, freight or passenger, installation, service and repair.
 [Order 73-22, § 296-17-523, filed 11/9/73, effective 1/1/74.]

WAC 296-17-524 Classification 6-3.

Machinery installation, dismantle and repair and millwright work, N.O.C.
 Engines and gas machines installation and belts, erection of shafting
 Dynamos, installation, service and repair including electrical generators and turbines.
 [Order 75-38, § 296-17-524, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-524, filed 11/9/73, effective 1/1/74.]

WAC 296-17-525 Classification 6-4.

Iron or steel scrap dealers
 Junk dealers
 Metal scrap dealers – collect, sort and reduction of scrap metal
 Battery salvaging.
 [Order 73-22, § 296-17-525, filed 11/9/73, effective 1/1/74.]

WAC 296-17-526 Classification 6-6.

Vending or coin-operated machines, operation, installation maintenance and service, includes product preparation by vending company
 Operation and maintenance amusement devices, N.O.C., fire extinguisher sales and service.
 [Order 73-22, § 296-17-526, filed 11/9/73, effective 1/1/74.]

WAC 296-17-527 Classification 6-7.

Household appliances electrical installation, service and repair

Television antenna installation and repair

This class will include installation, service and repair of radio and television receiving sets and two-way radio and radio-television repair.

[Order 73-22, § 296-17-527, filed 11/9/73, effective 1/1/74.]

WAC 296-17-528 Classification 7-1.

Dam construction, all operations in damsite area.

[Order 76-36, § 296-17-528, filed 11/30/76; Order 73-22, § 296-17-528, filed 11/9/73, effective 1/1/74.]

WAC 296-17-529 Classification 8-3.

Cities, all operations, except municipal power and transit systems, law enforcement officers and fire fighters

This class excludes clerical office and white collar employees.

[Order 77-27, § 296-17-529, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-529, filed 12/1/77; Order 75-38, § 296-17-529, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-529, filed 11/9/73, effective 1/1/74.]

WAC 296-17-530 Classification 8-4.

Commercial production of sand, gravel and processing clay and stone products

Clay pits

This class does not include quarry operations.

[Order 73-22, § 296-17-530, filed 11/9/73, effective 1/1/74.]

WAC 296-17-532 Classification 9-1.

Boat or ship building and dismantling metal hulls in excess of 35 feet, this class includes all shop and yard operations.

[Order 73-22, § 296-17-532, filed 11/9/73, effective 1/1/74.]

WAC 296-17-533 Classification 9-2.

Boat or ship building and dismantling, N.O.C. in excess of 35 feet, this class includes all shop and yard operations.

[Order 73-22, § 296-17-533, filed 11/9/73, effective 1/1/74.]

WAC 296-17-534 Classification 10-2.

Sawmills, operation and maintenance

Shingle mills, operation and maintenance

Shake mills, operation and maintenance

Planing and moulding mills, operation and maintenance

Lumber inspectors

Log storage and log sorting yards independent from logging operations subject to Class 50-1 (WAC 296-17-659)

Operations conducted in the woods subject to logging, N.O.C.

See Class 50-1 (WAC 296-17-659).

[Order 77-27, § 296-17-534, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-534, filed 11/30/76; Order 73-22, § 296-17-534, filed 11/9/73, effective 1/1/74.]

WAC 296-17-535 Classification 10-3.

Creosote works, pile and pole treating

Pole yard

Masts and spars yards.

[Order 77-27, § 296-17-535, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-535, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-535, filed 11/9/73, effective 1/1/74.]

WAC 296-17-536 Classification 11-1.

Automobile delivery drive away, automobile repossessing

Drivers of sound trucks, street vending vehicles

Delivery by wholesale, combined wholesale and retail stores and distributors, N.O.C.

Delivery by beer, ale, wine or soft drink distributors, wholesale or combined wholesale and retail

Delivery companies, deliver parcels and packages, no bulk merchandise

Septic tank and cesspool cleaning, excludes installation or repair

Street sweeping, parking lot sweeping, portable chemical toilets servicing

Anhydrous ammonia delivery

News agents or distributors of magazines, periodicals and telephone books, no retail dealer

Distribution of sample merchandise by vehicle

Armoured car service

This class to include all maintenance and repair of firm's equipment by firm's employees.

[Order 77-27, § 296-17-536, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-536, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-536, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-536, filed 11/9/73, effective 1/1/74.]

WAC 296-17-537 Classification 11-2.

Express companies and auto towing companies

Transport companies, freight hauling and trucking, N.O.C.

This class includes maintenance and repair of firm's equipment by firm's employees.

[Order 74-40, § 296-17-537, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-537, filed 11/9/73, effective 1/1/74.]

WAC 296-17-538 Classification 11-3.

Coal merchants, solid fuel yards

Lumber yards, building material dealers, excluding yard operations subject to Class 10-2 (WAC 296-17-534).

[Order 73-22, § 296-17-538, filed 11/9/73, effective 1/1/74.]

WAC 296-17-539 Classification 13-1.

Electric light and power plants

Electric light and power cooperatives
 Electric light and power public utility districts
 Electric systems, N.O.C.
 Steam heat and power plants
 Bridge tenders, electrically operated bridges, vehicular tunnels operation
 The operation of electric and steam plants includes extension of lines and meter readers.
 [Order 73-22, § 296-17-539, filed 11/9/73, effective 1/1/74.]

WAC 296-17-540 Classification 13-3.

Telephone companies, all other employees, operation and maintenance, extension of lines
 Telegraph companies, all other employees, operation and maintenance, extension of lines
 Television cable companies, operation and maintenance, extension of lines
 This class includes new construction and extension of lines by firms subject to this class.
 [Order 73-22, § 296-17-540, filed 11/9/73, effective 1/1/74.]

WAC 296-17-541 Classification 13-4.

Telephone companies, exchange operators, clerical office and salesmen
 Telegraph companies, clerical office and salesmen.
 [Order 73-22, § 296-17-541, filed 11/9/73, effective 1/1/74.]

WAC 296-17-542 Classification 14-1.

Ambulance services
 Taxicab companies
 Chauffeurs, N.O.C. - commercial
 Escort service
 Instructors - driving school
 This class includes maintenance and repair of firm's equipment by firm's employees.
 [Order 73-22, § 296-17-542, filed 11/9/73, effective 1/1/74.]

WAC 296-17-543 Classification 14-3.

Vessels, ferries, tug and steamboats operations, N.O.C., including dock employees, not maritime.
 [Order 73-22, § 296-17-543, filed 11/9/73, effective 1/1/74.]

WAC 296-17-544 Classification 14-4.

Bus or limousine companies, transit systems, contract bus driving
 This class includes maintenance and repair of firm's equipment by firm's employees.
 [Order 73-22, § 296-17-544, filed 11/9/73, effective 1/1/74.]

WAC 296-17-545 Classification 15-1.

Counties and taxing districts, N.O.C., all other employees

Housing authorities, local public, all other employees
 Indian Tribal Councils, all other employees
 This class excludes hospital districts, library districts, museum districts, port districts, public utility districts and school districts, law enforcement officers and fire fighters
 This class also excludes clerical office and white collar employees.
 [Order 77-27, § 296-17-545, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-545, filed 12/1/77; Order 73-22, § 296-17-545, filed 11/9/73, effective 1/1/74.]

WAC 296-17-546 Classification 15-7.

Waterworks operations, including extension of lines and meter readers
 Irrigation ditches, operation, repair and maintenance.
 [Order 74-40, § 296-17-546, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-546, filed 11/9/73, effective 1/1/74.]

WAC 296-17-548 Classification 17-1.

Ore reduction, by wet or dry process without application of heat at mine.
 [Order 73-22, § 296-17-548, filed 11/9/73, effective 1/1/74.]

WAC 296-17-549 Classification 17-2.

Mines, N.O.C., underground, all operations
 Coal mines, underground, all operations
 Coke ovens, all operations.
 [Order 75-38, § 296-17-549, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-549, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-549, filed 11/9/73, effective 1/1/74.]

WAC 296-17-550 Classification 17-3.

Open cut mining, all types
 Placer or hydraulic mining.
 [Order 75-38, § 296-17-550, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-550, filed 11/9/73, effective 1/1/74.]

WAC 296-17-551 Classification 17-4.

Quarries, N.O.C., includes stone crushing at quarry site
 Stone cutting, quarry hazard.
 [Order 73-22, § 296-17-551, filed 11/9/73, effective 1/1/74.]

WAC 296-17-552 Classification 18-1.

Smelting, sintering or refining lead, manufacturing calcium carbide
 Blast furnace operation
 Rolling mills steel or iron, rolling mills, N.O.C.
 Lead works - sheet, tinfoil manufacturing
 Lead manufacturing - red or white
 Smelting, sintering or refining ores, N.O.C.
 [Order 73-22, § 296-17-552, filed 11/9/73, effective 1/1/74.]

WAC 296-17-555 Classification 20-2.

Freight handlers - packing, handling or shipping merchandise N.O.C.

Refrigeration car, loading, unloading or icing

This class also includes employees engaged in repackaging of goods from damaged containers. This class also includes sky caps, red caps and baggage handlers employed by a contractor operating a railroad, bus or airline terminal.

This class excludes drivers.

[Order 75-38, § 296-17-555, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-555, filed 11/9/73, effective 1/1/74.]

WAC 296-17-556 Classification 20-3.

Hide or leather dealers.

[Order 73-22, § 296-17-556, filed 11/9/73, effective 1/1/74.]

WAC 296-17-557 Classification 20-4.

Iron or steel merchants, not junk or scrap dealers

This class also includes wire rope and cable dealers.

[Order 73-22, § 296-17-557, filed 11/9/73, effective 1/1/74.]

WAC 296-17-558 Classification 20-5.

Plumbers supplies dealers, wholesale or retail, gas, steam or hot water equipment.

[Order 73-22, § 296-17-558, filed 11/9/73, effective 1/1/74.]

WAC 296-17-559 Classification 20-6.

Oil or gas well supplies or equipment dealers, second hand

Bottle, paper stock, rag or rubber stock dealers, no metal, second hand

Machinery and equipment dealers, second hand

Building material dealers, second hand.

[Order 73-22, § 296-17-559, filed 11/9/73, effective 1/1/74.]

WAC 296-17-560 Classification 20-7.

Grain elevator or warehouse

Bean or pea elevator or warehouse.

[Order 75-38, § 296-17-560, filed 11/24/75, effective 1/1/76; 73-22, § 296-17-560, filed 11/9/73, effective 1/1/74.]

WAC 296-17-561 Classification 20-8.

Warehouses-field bonded, including clerical office at such location

This class excludes drivers.

[Order 73-22, § 296-17-561, filed 11/9/73, effective 1/1/74.]

WAC 296-17-562 Classification 21-1.

Grain milling, feed mills, feed manufacture, including preparation of cereal or compound feeds for livestock
Hay, grain or feed dealers

Seed merchants including operation of seed sorting machinery.

[Order 73-22, § 296-17-562, filed 11/9/73, effective 1/1/74.]

WAC 296-17-563 Classification 21-2.

Warehouses - general merchandise. Wholesale dealers to be separately rated. Drivers will be separately rated under Class 11-2 (WAC 296-17-537) truckmen, N.O.C.

Collection and receiving stations for rags, bottles, paper and metal containers, N.O.C., no junk dealers. Drivers will be separately rated under Class 11-2 (WAC 296-17-537) truckmen, N.O.C.

Grocery, fruit or produce distributors, wholesale or combined wholesale and retail. Drivers will be separately rated under Class 11-1 (WAC 296-17-536) delivery by combined wholesale and retail stores

Anhydrous ammonia, fertilizer and agricultural chemical dealers. Drivers will be separately rated under Class 11-1 (WAC 296-17-536) anhydrous ammonia delivery

Beer, ale, wine, or soft drink distributors, wholesale or combined wholesale and retail. Drivers will be separately rated under Class 11-1 (WAC 296-17-536) beer and ale delivery

Wool or cotton merchants. Drivers will be separately rated under Class 11-2 (WAC 296-17-537) truckmen, N.O.C.

All operations, including handling or packaging materials at warehouse.

[Order 77-27, § 296-17-563, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-563, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-563, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-563, filed 11/9/73, effective 1/1/74.]

WAC 296-17-564 Classification 21-4.

Vegetable packing

Fruit packing

This class includes cold storage operations if a part of packing operations; if a separate distinct operation or business, it is to be separately rated

This class does not include canning or freezing operations.

[Order 73-22, § 296-17-564, filed 11/9/73, effective 1/1/74.]

WAC 296-17-565 Classification 22-1.

Laundries and dry cleaning establishments

Cleaning and dyeing.

[Order 73-22, § 296-17-565, filed 11/9/73, effective 1/1/74.]

WAC 296-17-566 Classification 22-2.

Carpet, rug and upholstery cleaning, shop or outside

Laundries, N.O.C.

[Order 73-22, § 296-17-566, filed 11/9/73, effective 1/1/74.]

WAC 296-17-567 Classification 24-1.

Paper or pulp manufacturing, wood fibre manufacturing
 Paper box manufacturing, solid paper boxes
 Paper box manufacturing, folding paper boxes
 Corrugated and fibre board container manufacturing,
 including corrugating and laminating of paper
 Paper coating, corrugating, laminating or oiling
 Paper goods, N.O.C., manufacturing
 Building and roofing paper or felt preparation, no man-
 ufacturing felt.

[Order 77-27, § 296-17-567, filed 11/30/77, effective 1/1/78; Order 73-22, § 296-17-567, filed 11/9/73, effective 1/1/74.]

WAC 296-17-568 Classification 29-3.

Excelsior, kindling wood, hog fuel, particle board, lum-
 ber re-manufacturing
 Fishing pole manufacturing, wood, rattan or willow ware
 manufacturing

Coffin or casket manufacturing or assembly - wood
 Pencil or furniture stock manufacturing
 Furniture manufacturing, wood - including assembly
 Sash, door or assembled millwork manufacturing
 Assembly of other wood products from manufactured
 parts, N.O.C.

Box or shook, pallet, lath manufacturing, wood
 Cabinet shop, barrel stock manufacturing and assembly
 Wood products manufacturing and assembly, N.O.C.
 Veneer products manufacturing
 Pipe or tube manufacturing, wood only
 Door, door frames or sash manufacturing - wood cov-
 ered with metal

Glass merchants, including auto glass installation in
 shop

Housing, residential, factory-built shop only
 Mobile home, campers and travel trailers manufacturing
 Fibre ware manufacturing, N.O.C.

Counter tops manufacturing other than metal
 Wooden gun stock manufacturing, woodenware manu-
 facturing, N.O.C.

Sawmill operations to be separately rated under Class
 10-2 (WAC 296-17-534). Veneer manufacture to be
 separately rated under Class 29-4 (WAC 296-17-
 569)

Physically separated upholstery departments of firms
 engaged in furniture, coffin or casket manufacturing,
 assembly, or finishing, may be separately rated under
 Class 38-8 (WAC 296-17-612), and in accordance
 with WAC 296-17-410.

[Order 76-36, § 296-17-568, filed 11/30/76; Order 75-
 38, § 296-17-568, filed 11/24/75, effective 1/1/76;
 Order 75-28, § 296-17-568, filed 8/29/75, effective
 10/1/75; Order 73-22, § 296-17-568, filed 11/9/73,
 effective 1/1/74.]

WAC 296-17-569 Classification 29-4.

Veneer, commercial production
 Plywood manufacturing

This class includes all types of veneer production.
 [Order 73-22, § 296-17-569, filed 11/9/73, effective
 1/1/74.]

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WAC 296-17-570 Classification 29-6.

Pattern or model manufacturing, metal, plastic or wood
 Piano or musical instrument manufacturing, not metal.
 [Order 73-22, § 296-17-570, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-571 Classification 31-1.

Asbestos products manufacturing, including spinning or
 weaving, mica goods manufacturing
 Ready mix concrete dealers
 Soapstone or soapstone products manufacturing, marble
 cutting and polishing, slate milling
 Stone cutting or polishing, N.O.C., away from quarry
 Plasterboard or plaster block manufacturing
 Asphalt works, grinding, pulverizing or mixing asphalt
 Coating of building materials, N.O.C. - shop operations.
 [Order 75-38, § 296-17-571, filed 11/24/75, effective
 1/1/76; Order 73-22, § 296-17-571, filed 11/9/73, ef-
 fective 1/1/74.]

WAC 296-17-572 Classification 31-2.

Rock wool manufacturing, digging or quarrying to be
 separately rated.
 [Order 73-22, § 296-17-572, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-573 Classification 31-3.

Cement manufacturing, lime manufacturing
 Lightweight aggregate building or insulation material
 manufacturing
 Perlite, pozzolan, magnesite or expanded shale aggregate
 manufacturing
 Digging or quarrying to be separately rated.
 [Order 73-22, § 296-17-573, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-574 Classification 31-4.

Plaster mills and whiting manufacturing, quarrying to
 be separately rated.
 Talc mills and emery works.
 [Order 76-36, § 296-17-574, filed 11/30/76; Order 73-
 22, § 296-17-574, filed 11/9/73, effective 1/1/74.]

WAC 296-17-575 Classification 31-5.

Concrete blocks, bricks, poles, piles, tile and beam
 manufacturing
 Concrete sewer and irrigation pipes and concrete pro-
 ducts, N.O.C. manufacturing.
 [Order 73-22, § 296-17-575, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-576 Classification 33-1.

Fish canneries, fish freezing and processing, fish curing
 Fish trap operation, oystermen, oyster raising, fish
 rearing
 Oyster, crab, clam, canning or cold packing
 Sea foods products, N.O.C., canning or manufacturing
 Fish oil manufacturing
 Fish receiving and wholesaling

Marine life, non-edible, processing
 Fish markets, N.O.C.
 [Order 75-38, § 296-17-576, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-576, filed 11/9/73, effective 1/1/74.]

WAC 296-17-578 Classification 33-9.

Pleasurecraft sales or rental agency, N.O.C., including repair
 Motorcycle sales or rental agency, including repair.
 [Order 73-22, § 296-17-578, filed 11/9/73, effective 1/1/74.]

WAC 296-17-579 Classification 34-1.

Automobile, truck, mobile home, camper and trailer sales and/or rental agency, including repair shops
 Boat dealers, including repair shops
 Marinas and boat house operations, including repair shops
 Automobile, truck, body and fender repair shops, automobile, truck, paint and upholstery repair
 Automobile, truck, repair shops or garages
 Automobile or truck wrecking.
 [Order 75-38, § 296-17-579, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-579, filed 11/9/73, effective 1/1/74.]

WAC 296-17-580 Classification 34-2.

Air compressor manufacturing, elevator manufacturing, gear grinding or manufacturing
 Printing or bookbinding machinery manufacturing
 Pump manufacturing, safe manufacturing, scale manufacturing or repair shop, auto jack manufacturing
 Shoe machinery manufacturing, sprinkler head manufacturing, textile machinery manufacturing
 Confectioners machinery manufacturing, precision machined parts, N.O.C., manufacturing
 Machine shops, N.O.C., including mobile shops, tool sharpening
 Power saw, lawn and garden equipment and small motor repair, N.O.C.
 Boilermaking, tank building
 Metal goods manufacturing from material 9 gauge or heavier
 Furnace, heater or radiator manufacturing
 Saw manufacturing
 Heat treating metal
 Nut, bolt, screw, nail, tack, rivet, eyelet, spike and needle manufacturing
 Iron or steel works, shop, fabricate or assemble structural iron or steel
 Abrasive wheel manufacturing
 Welding or cutting, N.O.C.
 Lead burning, metal spraying - copper
 Automobile, truck, tractor radiator manufacturing and repair shops
 Coppersmithing, shop
 Office machinery manufacturing, N.O.C., cash register and sewing machine manufacturing
 Small arms, speedometer and carburetor manufacturing
 Sewing machine, commercial - repair and rebuild

Instrument manufacturing, scientific or professional
 Sound recording equipment, thermometer and steam gauge manufacturing
 Iron works - shop - manufacturing railings, staircases, fire escapes, etc.
 Brass, bronze, iron - ornamental - shop fabricating, assemble and manufacturing
 Iron works - shop - fabricate, assemble or manufacturing nonstructural iron or steel
 Tool manufacturing, not hot forming or stamping, die manufacturing - ferrous
 Auto body manufacturing - truck, trailer, bus body manufacturing, travel trailer body repair
 Steam cleaning portable, N.O.C., no buildings or structures
 Tool manufacturing, machine finishing
 Auto or truck parts, machining or rebuild not in vehicle
 Auto or truck engine manufacturing, aircraft engine manufacturing or rebuild, N.O.C.
 Bed spring or wire mattress manufacturing
 Valve manufacturing.
 [Order 76-36, § 296-17-580, filed 11/30/76; Order 75-38, § 296-17-580, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-580, filed 11/9/73, effective 1/1/74.]

WAC 296-17-581 Classification 34-3.

Aircraft manufacturing, including aircraft operations incident thereto
 Aircraft parts manufacturing, N.O.C.
 This class includes all operations including clerical office and salesmen.
 [Order 73-22, § 296-17-581, filed 11/9/73, effective 1/1/74.]

WAC 296-17-582 Classification 34-4.

Cans manufacturing
 Galvanized iron works, manufacturing - not structural
 Hardware manufacturing, N.O.C.
 Metal stamping, including plating and polishing
 Sign manufacturing other than wood - no installation
 Metal goods manufacturing, N.O.C., from material lighter than 9 gauge
 Aluminum ware manufacturing - from sheet aluminum
 Coffin-casket manufacturing or assemble, other than wood
 Awning manufacturing - metal - no installation
 Furniture, bedstead, shower-door, showcases - not wood - manufacturing
 Stove manufacturing, water heater assembly
 Electric or gas lighting fixtures, lampshades or lantern manufacturing - metal
 Brass or copper goods manufacturing
 Window, sash or door manufacturing - aluminum
 Auto parts manufacturing, miscellaneous stamped parts
 Ski manufacturing and toboggan manufacturing other than wood
 Fishing tackle manufacturing, N.O.C., fishing tackle—flies, lures, spinners assembly may be separately rated under Class 41-1 (WAC 296-17-620) in accordance with WAC 296-17-410.

[Order 75-38, § 296-17-582, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-582, filed 11/9/73, effective 1/1/74.]

WAC 296-17-583 Classification 34-6.

Auto or truck service station, car washes
Auto truck storage garages - no repair.
[Order 73-22, § 296-17-583, filed 11/9/73, effective 1/1/74.]

WAC 296-17-584 Classification 34-7.

Gas or oil dealers, wholesale or retail, including fuel oil, propane or butane
Asphalt, bitumen dealers
Oil refining-petroleum, including manufacturing of products obtained therefrom
Asphalt or tar, distilling or refining
Oil wells operation - oil or gas lease operators
Oil or gas wells - cementing
Oil or gas wells - specialty tool operation, N.O.C., by contractor
Oil or gas wells - installation or recovery of casing
Gas dealers, liquified petroleum gas, gas works, all operations
Oil or gas lease work, N.O.C. - by contractors-not lease operation
Oil or gas pipe line operation
Synthetic rubber manufacturing
Gasoline recovery from casing head or natural gas.
[Order 73-22, § 296-17-584, filed 11/9/73, effective 1/1/74.]

WAC 296-17-585 Classification 34-8.

Gas companies - natural gas - all operations - including clerical office and salesmen.
[Order 73-22, § 296-17-585, filed 11/9/73, effective 1/1/74.]

WAC 296-17-586 Classification 35-1.

Brick or clay products manufacturing, N.O.C.
Refractory products, fireproofing tile, flue lining and roofing tile manufacturing
Sewer tile, drainage tile and tile, N.O.C., manufacturing
Fireclay products manufacturing, foundry crucible
Briquettes manufacturing, peat fuel manufacturing
Mirror, glass sign manufacturing, etching or frosting glass
Glass ware manufacturing, N.O.C.
Glass manufacturing, N.O.C.
Paint, varnish or lacquer manufacturing
Putty manufacturing, synthetic resin manufacturing
Plastic feather or flower manufacturing
Agate or enamel ware manufacturing
Plaster statuary or ornament manufacturing - relief map manufacturing
Candle, crayon and paste manufacturing
Isinglass manufacturing
This class does not apply to the production of raw materials for use in the manufacture of the above articles.

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[Order 73-22, § 296-17-586, filed 11/9/73, effective 1/1/74.]

WAC 296-17-587 Classification 35-3.

Potteries, glazed or porcelain, earthenware manufacturing
Chinaware, tableware, decorative or architectural terracotta manufacturing
Decorative tile, clay tobacco pipes, manufacturing
This class does not apply to the production of raw materials for use in the manufacturing of the above articles.
[Order 73-22, § 296-17-587, filed 11/9/73, effective 1/1/74.]

WAC 296-17-588 Classification 35-4.

Incandescent lamp manufacturing, electronic tube or transistor manufacturing
This class does not apply to the production of raw materials for use in the manufacturing of the above articles.
[Order 73-22, § 296-17-588, filed 11/9/73, effective 1/1/74.]

WAC 296-17-590 Classification 35-6.

Crane, hoisting service and rigging contractors. This class excludes operations incidental to Classes 2-1 (WAC 296-17-508), 2-2 (WAC 296-17-509), 5-5 (WAC 296-17-520), 5-8 (WAC 296-17-521), 6-4 (WAC 296-17-525), 7-1 (WAC 296-17-528) and 50-1 (WAC 296-17-659) This class includes maintenance and repair of firm's equipment by firm's employees.
[Order 73-22, § 296-17-590, filed 11/9/73, effective 1/1/74.]

WAC 296-17-592 Classification 35-8.

Plastic goods manufacturing, N.O.C.
[Order 73-22, § 296-17-592, filed 11/9/73, effective 1/1/74.]

WAC 296-17-593 Classification 36-1.

Tag, button, zipper or fastener manufacturing, bottle cap manufacturing.
[Order 73-22, § 296-17-593, filed 11/9/73, effective 1/1/74.]

WAC 296-17-594 Classification 36-2.

Electronic products manufacturing; resistors, capacitors and relays manufacturing
Telephone, telegraph or radio apparatus manufacturing, N.O.C.
All operations.
[Order 75-38, § 296-17-594, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-594, filed 11/9/73, effective 1/1/74.]

WAC 296-17-595 Classification 36-3.

Metal plating or polishing, rustproofing - acid bath

Electroplating and de-tinning.

[Order 73-22, § 296-17-595, filed 11/9/73, effective 1/1/74.]

WAC 296-17-596 Classification 36-4.

Galvanizing or tinning – not electrolytic

Re-tinning, rustproofing – galvanizing or hot bath.

[Order 73-22, § 296-17-596, filed 11/9/73, effective 1/1/74.]

WAC 296-17-597 Classification 36-5.

Truck manufacturing or assembling.

[Order 73-22, § 296-17-597, filed 11/9/73, effective 1/1/74.]

WAC 296-17-598 Classification 36-6.

Boat building or repair, all types, N.O.C.

[Order 73-22, § 296-17-598, filed 11/9/73, effective 1/1/74.]

WAC 296-17-599 Classification 37-1.

Laboratories – analytical, testing or quality control for others, including outside operations, excluding outside x-raying and drilling

Ammonia, nitrogen and ammonium nitrate manufacturing

Nitrate recovery from x-ray and photo films

Manufacturing dye and chemicals for tinting candles

Chemical manufacturing, N.O.C., by nitration, alkylation, oxidation, etc. process. This classification includes the manufacturing of chemicals involving, but not limited to, the following chemical processes: nitration, alkylation, distillation, reduction, oxidation, sulphonation, compression of gasses, halogenation and amidation

Chemical mixing, blending and repackaging only – no manufacturing of ingredients

Cosmetics manufacturing, no manufacturing of ingredients

Drug, medicine or pharmaceutical preparation manufacturing, no manufacturing of ingredients

Oxygen or hydrogen manufacturing, acetylene gas or carbonic acid gas manufacturing

Alcohol manufacturing, distilling, N.O.C.

Polish, dressing, ink or mucilage manufacturing

Extract manufacturing, including distillation of essential oils

Perfumery manufacturing, including distillation of essential oils

Flavoring manufacturing, including distillation of essential oils

Mint distilling

Salt, borax or potash producing or refining

Serum, anti-toxin or virus manufacturing

Assaying laboratories.

[Order 74-40, § 296-17-599, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-599, filed 11/9/73, effective 1/1/74.]

WAC 296-17-600 Classification 37-2.

Breweries or malt houses

Bottling – beverages, N.O.C.

Spiritous liquor manufacturing

Wine making.

[Order 73-22, § 296-17-600, filed 11/9/73, effective 1/1/74.]

WAC 296-17-601 Classification 37-3.

Acid manufacturing – sulphuric, hydrochloric or nitric only.

[Order 73-22, § 296-17-601, filed 11/9/73, effective 1/1/74.]

WAC 296-17-602 Classification 37-6.

Bag manufacturing – traveling bags or hand luggage.

[Order 73-22, § 296-17-602, filed 11/9/73, effective 1/1/74.]

WAC 296-17-603 Classification 37-7.

Rubber boot manufacturing, rubber goods manufacturing, N.O.C.

Waterproofing cloth – rubber.

[Order 75-38, § 296-17-603, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-603, filed 11/9/73, effective 1/1/74.]

WAC 296-17-604 Classification 37-8.

Linoleum, oil cloth or imitation leather manufacturing.

[Order 73-22, § 296-17-604, filed 11/9/73, effective 1/1/74.]

WAC 296-17-605 Classification 38-1.

Broom or brush manufacturing, or assembly

Cordage, rope or twine manufacturing, N.O.C.

Glove manufacturing, leather, belting manufacturing, leather

Leather goods manufacturing, N.O.C.

Match manufacturing

Boot or shoe manufacturing or repair, N.O.C.

Leather embossing

Cotton cord or cotton twine manufacturing

Shoe stock manufacturing, gasket manufacturing – not metal or asbestos.

[Order 75-38, § 296-17-605, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-605, filed 11/9/73, effective 1/1/74.]

WAC 296-17-606 Classification 38-2.

Lace, embroidery, cloth hats, umbrella and draperies manufacturing

Parachutes, suspenders, fur goods and bandages manufacturing

Clothing manufacturing, N.O.C.

Awning, tent, sail or sleeping bag manufacturing

Life preservers and canvas goods manufacturing, N.O.C.

Braid, net, plush and velvet, thread, webbing and yarn manufacturing

Spinning or weaving – natural or synthetic fibres,
N.O.C.

Upholstering away from shop

Pillow, quilt or cushion manufacturing

Mattress or box springs manufacturing – no manufac-
turing wire springs or excelsior

Gloves manufacturing, N.O.C.

Abrasive cloth preparation

Bag or sack manufacturing or renovating – cotton, bur-
lap or gunny

Carpet or rug manufacturing

Fire hose manufacturing from linen thread

Cotton batting, wadding or waste manufacturing

Felting manufacturing, shoddy manufacturing

Wool combing or scouring

Millinery manufacturing, artificial feather or flower
manufacturing, N.O.C.

Wig making

Fishing rod wrappings, manufacturing.

[Order 75-38, § 296-17-606, filed 11/24/75, effective
1/1/76; Order 73-22, § 296-17-606, filed 11/9/73, ef-
fective 1/1/74.]

WAC 296-17-607 Classification 38-3.

Hosiery manufacturing, knit goods manufacturing.

[Order 73-22, § 296-17-607, filed 11/9/73, effective
1/1/74.]

WAC 296-17-608 Classification 38-4.

Fabric coating, impregnating or waterproofing, N.O.C.

Textiles bleaching, dyeing or finishing, new goods, not
garments.

[Order 73-22, § 296-17-608, filed 11/9/73, effective
1/1/74.]

WAC 296-17-609 Classification 38-5.

Cloth printing.

[Order 73-22, § 296-17-609, filed 11/9/73, effective
1/1/74.]

WAC 296-17-610 Classification 38-6.

Dressmaking or tailoring – custom exclusively – no
manufacturing.

[Order 73-22, § 296-17-610, filed 11/9/73, effective
1/1/74.]

WAC 296-17-612 Classification 38-8.

Upholstery shop – furniture, auto or boat.

[Order 75-28, § 296-17-612, filed 8/29/75, effective
10/1/75; Order 73-22, § 296-17-612, filed 11/9/73,
effective 1/1/74.]

WAC 296-17-613 Classification 38-9.

Taxidermists.

[Order 73-22, § 296-17-613, filed 11/9/73, effective
1/1/74.]

WAC 196-17-614 Classification 39-1.

Bakeries, cracker or potato chip manufacturing

Ravioli or tamale manufacturing

Macaroni manufacturing

Confectionery and chewing gum manufacturing

Cough drop manufacturing.

[Order 73-22, § 296-17-614, filed 11/9/73, effective
1/1/74.]

WAC 296-17-615 Classification 39-2.

Fruit and vegetable cannery and freezer operations

Fruit and vegetable evaporating, preserving or
dehydrating

Fruit syrup manufacturing, fruit juice manufacturing,
jam or jelly manufacturing, cider manufacturing

Pea vining

Corn products, chocolate and cocoa manufacturing

Baking powder, dextrine, glucose, starch and yeast
manufacturing

Nut shelling, egg breaking, coconut shredding and pea-
nut handling

Food sundries manufacturing and food processing,
N.O.C.

Pickle manufacturing, sauerkraut manufacturing

Pet food manufacturing

Butter substitutes manufacturing

Breakfast food manufacturing

Poultry canning and canneries, N.O.C.

[Order 75-38, § 296-17-615, filed 11/24/75, effective
1/1/76; Order 74-40, § 296-17-615, filed 11/27/74,
effective 1/1/75; Order 73-22, § 296-17-615, filed
11/9/73, effective 1/1/74.]

WAC 296-17-616 Classification 39-3.

Sugar refining

Molasses manufacturing, syrup manufacturing, N.O.C.

[Order 73-22, § 296-17-616, filed 11/9/73, effective
1/1/74.]

WAC 296-17-617 Classification 39-4.

Vegetable oil manufacturing.

[Order 73-22, § 296-17-617, filed 11/9/73, effective
1/1/74.]

WAC 296-17-618 Classification 39-5.

Restaurants and taverns

Food, drink, candy, etc. concessionaires at parks, tracks
and exhibitions including vending concessionaires dis-
pensing food, drink, candy, etc. at ball parks, race
tracks, theatres and exhibitions. This classification is
not applicable to street vendors who shall be rated
under class 11-1 (WAC 296-17-536)

Caterers

Commissaries and restaurants with construction, erec-
tion, logging or mine operations

Eating establishments, N.O.C., including public lunch
counters in stores, and doughnut shops.

[Order 75-38, § 296-17-618, filed 11/24/75, effective
1/1/76; Order 74-40, § 296-17-618, filed 11/27/74,
effective 1/1/75; Order 73-22, § 296-17-618, filed
11/9/73, effective 1/1/74.]

WAC 296-17-619 Classification 40-2.

Dairy products manufacturing, N.O.C.
 Butter, cheese, ice cream and ice cream mix
 manufacturing
 Creameries and dairies, operation
 Condensed milk manufacturing
 This class does not include operations subject to Class
 48-3 (WAC 296-17-644).
 [Order 73-22, § 296-17-619, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-620 Classification 41-1.

Printing, lithography, engraving, map printing
 Rubber stamp manufacturing and assembling
 Bookbinding, with printing
 Dental laboratories
 Jewelry manufacturing or engraving
 Electronic parts assembly
 Electrical cordset, radio and ignition assembly
 Watch manufacturing
 Photoengraving
 Motion picture projectors and camera repair
 Assembly of fishing tackle—flies, lures and spinners.
 [Order 75-38, § 296-17-620, filed 11/24/75, effective
 1/1/76; Order 73-22, § 296-17-620, filed 11/9/73, ef-
 fective 1/1/74.]

WAC 296-17-621 Classification 41-2.

Silverware manufacturing, watch case manufacturing.
 [Order 73-22, § 296-17-621, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-622 Classification 41-3.

Newspaper publishing
 Outside reporters, advertising or circulation solicitors
 and photographers shall be rated under Class 63-3
 (WAC 296-17-698)
 Editing, designing, proofreading, photographic composi-
 tion and clerical office employees shall be rated under
 Class 49-4 (WAC 296-17-653)
 This class excludes newspaper publishers with no print-
 ing operations.
 [Order 75-38, § 296-17-622, filed 11/24/75, effective
 1/1/76; Order 73-22, § 296-17-622, filed 11/9/73, ef-
 fective 1/1/74.]

WAC 296-17-623 Classification 41-4.

Linotype or hand composition.
 [Order 73-22, § 296-17-623, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-624 Classification 41-5.

Electrotyping.
 [Order 73-22, § 296-17-624, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-625 Classification 41-6.

Magnetic tape manufacturing.
 [Order 73-22, § 296-17-625, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-626 Classification 41-7.

Business machine service, adjustment, or repair, N.O.C.
 This class includes the installation of typewriters,
 adding machines and reproduction machines, either
 electric or manual, but does not include installation of
 computer systems; these will be rated under Class 6-1
 (WAC 296-17-522)
 Piano tuning.
 [Order 73-22, § 296-17-626, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-627 Classification 41-8.

Letter service shops and mailing or addressing compa-
 nies, includes clerical office employees.
 [Order 73-22, § 296-17-627, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-628 Classification 41-9.

Sign painting or lettering inside buildings
 Sign painting in shop
 This class does not include sign manufacture.
 [Order 73-22, § 296-17-628, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-629 Classification 42-1.

Longshoring and stevedoring
 Wharf and pier, operation
 Port districts, including salesmen
 Coal dock operation - by means of mechanical appara-
 tus, including stevedoring
 Stevedoring, N.O.C., supercargo checkers
 Stevedoring - by hand or hand truck exclusively, no
 hoisting of cargo
 Stevedoring, loading and unloading ships designed for
 freight carrying containers
 Tallymen, checking clerks in connection with stevedoring
 work
 Employees engaged in mending and repacking of
 damaged containers in connection with stevedoring
 work.
 [Order 73-22, § 296-17-629, filed 11/9/73, effective
 1/1/74.]

WAC 296-17-630 Classification 43-1.

Fertilizer manufacturing
 Glue manufacturing
 Lard making or refining
 Meat and poultry markets retail
 Meat and poultry dealers wholesale
 Sausage manufacturing
 Packing house - all operations - including butchering
 and handling livestock
 Meat products manufacturing, including canning or
 dehydrating
 Peat moss shredding and baling

Tallow making
Tanneries, fur manufacturing
Sausage casings, wholesale dealer
Rendering works, N.O.C.
[Order 76-36, § 296-17-630, filed 11/30/76; Order 75-38, § 296-17-630, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-630, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-630, filed 11/9/73, effective 1/1/74.]

WAC 296-17-631 Classification 43-2.

Slaughter houses, custom butchering.
[Order 76-36, § 296-17-631, filed 11/30/76; Order 73-22, § 296-17-631, filed 11/9/73, effective 1/1/74.]

WAC 296-17-632 Classification 43-3.

Soap making, lard base or synthetic detergent.
[Order 73-22, § 296-17-632, filed 11/9/73, effective 1/1/74.]

WAC 296-17-633 Classification 43-4.

Feed lots
Stock yards, no slaughtering
Livestock auction and sales yards
Livestock buyers.
[Order 75-38, § 296-17-633, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-633, filed 11/9/73, effective 1/1/74.]

WAC 296-17-634 Classification 43-5.

Garbage works, landfill, reduction or incineration
Garbage, refuse or ashes collecting.
[Order 75-38, § 296-17-634, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-634, filed 11/9/73, effective 1/1/74.]

WAC 296-17-635 Classification 44-1.

Cold storage plants, lockers operation
Ice manufacturing, artificial
Ice harvesting
Ice dealers.
[Order 73-22, § 296-17-635, filed 11/9/73, effective 1/1/74.]

WAC 296-17-636 Classification 44-4.

Storage warehouse, cold.
[Order 73-22, § 296-17-636, filed 11/9/73, effective 1/1/74.]

WAC 296-17-637 Classification 45-1.

Radio or television broadcasting companies - transmitter or field employees outside, N.O.C.
[Order 75-38, § 296-17-637, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-637, filed 11/9/73, effective 1/1/74.]

WAC 296-17-638 Classification 45-2.

Radio broadcasting stations, all other employment including clerical office

Television broadcasting stations, all other employment including clerical office
Recording companies, studio and clerical office employees
Television cable companies, studio and clerical office employees
"All other employees" includes control operators confined to studio exclusively, announcers, players, entertainers or musicians.
[Order 73-22, § 296-17-638, filed 11/9/73, effective 1/1/74.]

WAC 296-17-639 Classification 45-3.

Drive-in theatres - all operations.
[Order 75-38, § 296-17-639, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-639, filed 11/9/73, effective 1/1/74.]

WAC 296-17-640 Classification 45-4.

Theatres, N.O.C., all operations, including clerical office and salesmen, excluding players, entertainers, musicians
This class includes managers, stage hands, box office employees, ushers, motion picture operators and snack bar employees.
[Order 73-22, § 296-17-640, filed 11/9/73, effective 1/1/74.]

WAC 296-17-641 Classification 46-1.

Fireworks manufacturing
Powder works manufacturing
Combined chemicals and explosives manufacturing.
[Order 74-40, § 296-17-641, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-641, filed 11/9/73, effective 1/1/74.]

WAC 296-17-643 Classification 48-2.

Truck gardening - farm-to-market fresh produce, excluding meats of any kind
Berry farms
Flower seed growing
Bulb raising
Vineyards
Picking of forest products, N.O.C.
[Order 77-27, § 296-17-643, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-643, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-643, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-643, filed 11/9/73, effective 1/1/74.]

WAC 296-17-644 Classification 48-3.

Christmas tree planting, pruning and harvesting
Dairy farms
Sheep and goat raising
Stock farms, N.O.C.
Orchards and hop farms
Tree farming. Excludes any operations subject to Class 50-1 (WAC 296-17-659)
Sheep and goat raising and stock farms, N.O.C., applies to all acreage devoted to raising of these animals

Orchards and hop farms – applies to all tree crops, deciduous and fruits, nuts, and shall include all acreage devoted to the raising of such crops

This class includes all operations incidental to the enterprises described above.

[Order 75-38, § 296-17-644, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-644, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-644, filed 11/9/73, effective 1/1/74.]

WAC 296-17-645 Classification 48-4.

Poultry raising, egg production and hatcheries

Egg grading, candling and packing

Fur bearing animals and rabbit raising

This class applies to acreage devoted to the raising of poultry, rabbits and fur bearing animals.

[Order 74-40, § 296-17-645, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-645, filed 11/9/73, effective 1/1/74.]

WAC 296-17-646 Classification 48-5.

Farms – nursery, green houses, mushroom raising

Nursery applies to all acreage devoted to nursery operations and including tree nurseries

This class also includes field growing of flowers; (excludes bulb-raising).

[Order 75-38, § 296-17-646, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-646, filed 11/9/73, effective 1/1/74.]

WAC 296-17-647 Classification 48-6.

Farms – hand harvest

This class includes ground hand picking of vegetables, nuts, berries, prunes, field flowers, and bulbs. Excludes pumpkin, squash, melon or potato harvesting.

[Order 76-36, § 296-17-647, filed 11/30/76; Order 75-38, § 296-17-647, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-647, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-647, filed 11/9/73, effective 1/1/74.]

WAC 296-17-648 Classification 48-7.

Construction, remodel, or repair by homeowners employing workmen to perform work on or about a homeowner's personal residence. Mandatory coverage under this class is exempt until after 10 consecutive work days pursuant to RCW 51.12.020(2).

[Order 75-38, § 296-17-648, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-648, filed 11/9/73, effective 1/1/74.]

WAC 296-17-649 Classification 48-8.

Alfalfa and clover seed growing

Potato sorting and storage, N.O.C.

Field crops – includes raising of all hay, cereal grains, sugar beets, and vegetables, N.O.C.

This class applies to all operations incidental to the enterprises described above with the exception of asparagus harvesting.

[Order 75-38, § 296-17-649, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-649, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-649, filed 11/9/73, effective 1/1/74.]

WAC 296-17-650 Classification 49-1.

Consulting engineering and architectural firms

Foresters, forest rangers, timber cruisers and surveyors

Log scaling and grading bureaus

Shingle and shake inspection and grading bureaus

Inspection and grading bureaus, N.O.C.

Testing and inspecting of pipe lines – radiographers

X-raying by contractor at industrial plants or construction sites

Rainmaking – not by aircraft

Geophysical exploration, N.O.C., no core drilling

Prospectors

Oil or gas geologists or scouts

Lease buyers performing work similar to oil geologists

Geologists, N.O.C.

[Order 75-38, § 296-17-650, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-650, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-650, filed 11/9/73, effective 1/1/74.]

WAC 296-17-651 Classification 49-2.

State employees

This class includes all departments, agencies, boards, commissions and committees of either the executive, legislative or judicial branches of state government.

[Order 73-22, § 296-17-651, filed 11/9/73, effective 1/1/74.]

WAC 296-17-652 Classification 49-3.

Marine appraisers Boiler inspecting on premises

Elevator inspecting, no service

Inspection for insurance or valuation.

[Order 73-22, § 296-17-652, filed 11/9/73, effective 1/1/74.]

WAC 296-17-653 Classification 49-4.

Clerical office, N.O.C.

Clerical office, information and reservation clerks and ticket sellers of air and bus lines and airports

Draftsmen

Parimutuel clerks and cashiers at race tracks.

[Order 73-22, § 296-17-653, filed 11/9/73, effective 1/1/74.]

WAC 296-17-654 Classification 49-5.

Hotels, all operations – excluding restaurant and bar employees

Motels, all operations – excluding restaurant and bar employees

Apartment houses, all operations

Building management – all operations.

[Order 76-36, § 296-17-654, filed 11/30/76; Order 73-22, § 296-17-654, filed 11/9/73, effective 1/1/74.]

WAC 296-17-655 Classification 49-6.

Academic and nonacademic employees of institutions of higher learning.

[Order 73-22, § 296-17-655, filed 11/9/73, effective 1/1/74.]

WAC 296-17-656 Classification 49-7.

Inmates employed in prison industries.

[Order 73-22, § 296-17-656, filed 11/9/73, effective 1/1/74.]

WAC 296-17-657 Classification 49-8.

Inmates of adult honor camps.

[Order 73-22, § 296-17-657, filed 11/9/73, effective 1/1/74.]

WAC 296-17-658 Classification 49-9.

Inmates of juvenile forest camps.

[Order 73-22, § 296-17-658, filed 11/9/73, effective 1/1/74.]

WAC 296-17-659 Classification 50-1.

Log hauling by contractor

Logging operations, N.O.C.

Logging shall be considered the complete operation, including falling and bucking, skidding, yarding, loading, transportation of logs and maintenance of equipment except as otherwise provided. This class also includes aircraft operations incident thereto.

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 77-27, § 296-17-659, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-659, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-659, filed 11/9/73, effective 1/1/74.]

WAC 296-17-660 Classification 50-2.

Booming and rafting logs.

[Order 73-22, § 296-17-660, filed 11/9/73, effective 1/1/74.]

WAC 296-17-661 Classification 51-1.

Pipe or tube manufacturing, iron or steel.

[Order 73-22, § 296-17-661, filed 11/9/73, effective 1/1/74.]

WAC 296-17-662 Classification 51-2.

Foundries iron, N.O.C., sandblasting shop

Furnace, radiator manufacturing, cast

Enameled iron ware manufacturing.

[Order 75-38, § 296-17-662, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-662, filed 11/9/73, effective 1/1/74.]

WAC 296-17-663 Classification 51-3.

Foundries, steel castings

Type foundries, die casting manufacturing, non-ferrous

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Foundries, magnesium.

[Order 73-22, § 296-17-663, filed 11/9/73, effective 1/1/74.]

WAC 296-17-664 Classification 51-4

Tool manufacturing, hot forming or stamping.

[Order 73-22, § 296-17-664, filed 11/9/73, effective 1/1/74.]

WAC 296-17-665 Classification 51-5.

Forging works, drop or machine

Chain manufacturing, forged.

[Order 73-22, § 296-17-665, filed 11/9/73, effective 1/1/74.]

WAC 296-17-666 Classification 51-6.

Blacksmithing, spring manufacturing, not wire spring, auto bumper manufacturing.

[Order 73-22, § 296-17-666, filed 11/9/73, effective 1/1/74.]

WAC 296-17-667 Classification 51-7.

Electrical toasters, frying pans, and wire harnesses manufacturing

Vacuum cleaners and electrical appliances manufacturing, N.O.C.

Electric motors, generators, convertors, solenoids and servomotors rated less than 746 watts, manufacturing and repair.

[Order 75-38, § 296-17-667, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-667, filed 11/9/73, effective 1/1/74.]

WAC 296-17-668 Classification 51-8.

Cable or wire rope drawing and manufacturing.

[Order 73-22, § 296-17-668, filed 11/9/73, effective 1/1/74.]

WAC 296-17-669 Classification 51-9.

Heavy machinery and equipment manufacturing or repair — used in connection with construction, agriculture or mining equipment

Heavy arms manufacturing or repair.

[Order 75-38, § 296-17-669, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-669, filed 11/9/73, effective 1/1/74.]

WAC 296-17-670 Classification 52-1.

Electric power or transmission equipment, motors, generators, convertors, etc., 1 horsepower or more, manufacturing

This classification contemplates the manufacturing or repair of motors, generators, convertors, transformers, switchboards, circuit breakers, switches or switchboard apparatus or incidental equipment with a rating of 1 horsepower or more.

[Order 73-22, § 296-17-670, filed 11/9/73, effective 1/1/74.]

WAC 296-17-671 Classification 52-2.

Battery manufacturing.
[Order 73-22, § 296-17-671, filed 11/9/73, effective 1/1/74.]

WAC 296-17-672 Classification 52-3.

Auto or motorcycle manufacturing or assembly.
[Order 73-22, § 296-17-672, filed 11/9/73, effective 1/1/74.]

WAC 296-17-673 Classification 52-4.

Railroad car manufacturing or repair
Railroad car wheel manufacturing or repair.
[Order 75-38, § 296-17-673, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-673, filed 11/9/73, effective 1/1/74.]

WAC 296-17-674 Classification 52-5.

Cable or wire rope manufacturing, no drawing
Cable or wire insulating or covering.
[Order 73-22, § 296-17-674, filed 11/9/73, effective 1/1/74.]

WAC 296-17-675 Classification 52-6.

Permanent yard or shop for maintenance or storage of firm's equipment or material
This class to be assigned only to operations incidental to Classes 1-1 (WAC 296-17-501), 1-2 (WAC 296-17-502), 1-3 (WAC 296-17-503), 1-4 (WAC 296-17-504), 2-1 (WAC 296-17-508), 2-2 (WAC 296-17-509), 5-5 (WAC 296-17-520), 5-8 (WAC 296-17-521), 50-1 (WAC 296-17-659) and 69-2 (WAC 296-17-747) and is applicable only to a permanent yard or shop maintained by the employer for the storage of material, or the storage and maintenance of equipment. This class is applicable only to those employees regularly assigned to the shop or yard, and whose duties are solely incidental to the storage, repair or maintenance of the employer's equipment or material. No employee having any other duties during his shift or work day will be rated in this class.
[Order 76-36, § 296-17-675, filed 11/30/76; Order 73-22, § 296-17-675, filed 11/9/73, effective 1/1/74.]

WAC 296-17-676 Classification 52-7.

Bowling alleys, all employees, including tavern or restaurant employees.
[Order 73-22, § 296-17-676, filed 11/9/73, effective 1/1/74.]

WAC 296-17-677 Classification 53-1.

Accounting or bookkeeping firms
Law firms
Clerical office to be separately rated.
[Order 75-38, § 296-17-677, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-677, filed 11/9/73, effective 1/1/74.]

WAC 296-17-678 Classification 53-5.

Clerical office and white collar employees of cities.
[Order 73-22, § 296-17-678, filed 11/9/73, effective 1/1/74.]

WAC 296-17-679 Classification 53-6.

Clerical office and white collar employees of county and taxing districts, N.O.C.
Clerical office and white collar employees of Indian Tribal Councils.
[Order 73-22, § 296-17-679, filed 11/9/73, effective 1/1/74.]

WAC 296-17-680 Classification 61-3.

Schools - public - academic
Schools - private - academic
Schools - trade or vocational, N.O.C.
Libraries, N.O.C.
Churches
Museums, N.O.C.
Day nurseries or child care centers - public
Day nurseries or child care centers - private
This class for professional and clerical office employees
See Class 61-4 (WAC 296-17-681) for other employees.
[Order 73-22, § 296-17-680, filed 11/9/73, effective 1/1/74.]

WAC 296-17-681 Classification 61-4.

Schools - public - academic
Schools - private - academic
Schools - trade or vocational, N.O.C.
Libraries, N.O.C.
Churches
Museums, N.O.C.
Day nurseries or child care centers - public
Day nurseries or child care centers - private
All employees, N.O.C.
[Order 73-22, § 296-17-681, filed 11/9/73, effective 1/1/74.]

WAC 296-17-682 Classification 61-5.

Hospitals - religious and charitable
Hospitals - other, not city or county
Medical laboratories
Blood banks
Nursing care, N.O.C.
This class for professional and clerical office employees
See Class 61-6 (WAC 296-17-683) for other employees.
[Order 73-22, § 296-17-682, filed 11/9/73, effective 1/1/74.]

WAC 296-17-683 Classification 61-6.

Hospitals - religious and charitable
Hospitals - other, not city or county
Medical laboratories
Blood banks

All employment, N.O.C.
[Order 73-22, § 296-17-683, filed 11/9/73, effective 1/1/74.]

WAC 296-17-684 Classification 61-7.

Veterinaries
Veterinary hospitals
Humane societies
Dog pounds
Animal shelters
Dog grooming parlors
All operations including clerical office.
[Order 73-22, § 296-17-684, filed 11/9/73, effective 1/1/74.]

WAC 296-17-685 Classification 61-8.

Convalescent or nursing homes
Rest homes
Homes for the aged
All operations including clerical office
This class includes convalescent or nursing homes, rest homes or homes for the aged required to provide nursing care for the residents.
[Order 75-38, § 296-17-685, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-685, filed 11/9/73, effective 1/1/74.]

WAC 296-17-686 Classification 61-9.

Physicians and surgeons
Dentists
Chiropractors
Osteopaths
Naturopaths
Podiatrists
Medical clinics
Dental clinics
Physical therapists
Optometrists
All operations including clerical office.
[Order 73-22, § 296-17-686, filed 11/9/73, effective 1/1/74.]

WAC 296-17-687 Classification 62-1.

Funeral directors - mortuaries
Crematoriums
Excludes cemetery operations.
[Order 73-22, § 296-17-687, filed 11/9/73, effective 1/1/74.]

WAC 296-17-688 Classification 62-2.

Cemeteries - all operations.
[Order 73-22, § 296-17-688, filed 11/9/73, effective 1/1/74.]

WAC 296-17-689 Classification 62-3.

YMCA/YWCA institutions
Boys or girls clubs
Excludes camp operations
All operations including clerical office.
[Order 75-38, § 296-17-689, filed 11/24/75, effective

1/1/76; Order 73-22, § 296-17-689, filed 11/9/73, effective 1/1/74.]

WAC 296-17-690 Classification 62-4.

Baths, N.O.C.
Health clubs
Exercise or health institutes
Gymnasiums
All operations including clerical office.
[Order 73-22, § 296-17-690, filed 11/9/73, effective 1/1/74.]

WAC 296-17-691 Classification 62-5.

Clubs, N.O.C.
Fraternal clubs
Tennis clubs
Social clubs
Beach clubs, N.O.C.
All operations.
[Order 73-22, § 296-17-691, filed 11/9/73, effective 1/1/74.]

WAC 296-17-692 Classification 62-6.

Ski clubs
Country clubs
Golf clubs
Swimming clubs
Yachting clubs
Golf courses, N.O.C., not miniature golf
All operations.
[Order 73-22, § 296-17-692, filed 11/9/73, effective 1/1/74.]

WAC 296-17-693 Classification 62-7.

Carnivals - traveling
Circuses - traveling
Amusement device operators - traveling
Rodeos - arena employees
Fireworks exhibition
All operations including clerical office.
[Order 77-27, § 296-17-693, filed 11/30/77, effective 1/1/78; Order 73-22, § 296-17-693, filed 11/9/73, effective 1/1/74.]

WAC 296-17-694 Classification 62-8.

Amusement parks
Ranges - archery, ball, dart, golf
Caves or caverns operation for exhibition purposes - including rides, ticket sellers, gate attendants
Concessions - boats in parks
Fairs
Shows - animal
Shows - flower, art
Miniature golf courses
Kiddie rides - permanent locations
Race tracks
Shooting galleries, air rifle - no firearms
Skating rinks - ice or roller

Care, custody and maintenance.

[Order 76-36, § 296-17-694, filed 11/30/76; Order 73-22, § 296-17-694, filed 11/9/73, effective 1/1/74.]

WAC 296-17-695 Classification 62-9.

Boy/Girl Scout Council Camp employees

Trailer/Mobile home parks or camps

Resorts or camp grounds

Dude ranches – not cattle ranches

Bath houses – beach

Church camps

Swimming pools – public

YMCA/YWCA camp employees

Camp operations, recreational or educational, N.O.C.

All operations including clerical office.

[Order 76-36, § 296-17-695, filed 11/30/76; Order 73-22, § 296-17-695, filed 11/9/73, effective 1/1/74.]

WAC 296-17-696 Classification 63-1.

Automobile salesmen

Truck salesmen

Camper salesmen

Trailer or mobile home salesmen

Motorcycle salesmen

Pleasurecraft salesmen – no aircraft.

[Order 73-22, § 296-17-696, filed 11/9/73, effective 1/1/74.]

WAC 296-17-697 Classification 63-2.

Coffee, tea, grocery salesmen

Household furnishings salesmen

Wearing apparel salesmen

Vacuum cleaner salesmen

Book salesmen

Cosmetics salesmen

Magazine salesmen

Door to door salesmen, N.O.C.

This class is for door to door salesmen.

[Order 73-22, § 296-17-697, filed 11/9/73, effective 1/1/74.]

WAC 296-17-698 Classification 63-3.

Salesmen, N.O.C. – outside

Collectors, messengers, appraisers, estimators, public relations, counsellors, N.O.C.

Real estate salesmen – outside

Insurance salesmen and claims adjustors – outside

Machinery salesmen – outside – construction, mining, heavy equipment

Farm machinery salesmen – outside.

[Order 76-36, § 296-17-698, filed 11/30/76; Order 73-22, § 296-17-698, filed 11/9/73, effective 1/1/74.]

WAC 296-17-699 Classification 63-4.

Department stores – including clerical office and salesmen and installation of household furnishings

This class excludes automotive repair and service and other outside installation or construction.

[Order 73-22, § 296-17-699, filed 11/9/73, effective 1/1/74.]

WAC 296-17-700 Classification 63-5.

Clothing stores – retail

Dry goods stores – retail

Shoe stores – retail

Concessions for hat and coat checking

All operations including clerical office.

[Order 73-22, § 296-17-700, filed 11/9/73, effective 1/1/74.]

WAC 296-17-701 Classification 63-6.

Furniture stores wholesale/retail

Furniture rental stores

Appliance stores wholesale/retail

Piano or organ stores, N.O.C., wholesale/retail

Office furniture stores – wholesale/retail

This class will include installation of house furnishings, and household floor coverings, household appliances, service and repair of household appliances

Excludes contract installation.

[Order 76-36, § 296-17-701, filed 11/30/76; Order 75-38, § 296-17-701, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-701, filed 11/9/73, effective 1/1/74.]

WAC 296-17-703 Classification 63-8.

Jewelry stores – wholesale/retail, watch repair

Hearing-aid stores – wholesale/retail

Optical stores, no lens grinding – wholesale/retail

All operations including clerical office.

[Order 73-22, § 296-17-703, filed 11/9/73, effective 1/1/74.]

WAC 296-17-704 Classification 63-9.

Hardware stores – wholesale/retail

Tool rental stores

Gunsmithing

Bicycle stores – wholesale or retail

Electrical hardware dealers – wholesale/retail

Garden supply stores – wholesale or retail

Locksmiths

Auto accessory or replacement parts stores, wholesale or retail – excludes repair

All operations including clerical office and salesmen.

[Order 76-36, § 296-17-704, filed 11/30/76; Order 75-38, § 296-17-704, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-704, filed 11/9/73, effective 1/1/74.]

WAC 296-17-706 Classification 64-2.

Grocery and meat stores, combined – retail including clerical office

Lunch counters and restaurant operations to be separately rated.

[Order 73-22, § 296-17-706, filed 11/9/73, effective 1/1/74.]

WAC 296-17-707 Classification 64-3.

Grocery stores – retail, no fresh meat cutting

Coffee, tea or spice stores – retail

Dairy products stores – retail

Delicatessens – retail, no fresh meat
 Fruit or vegetable stores – retail
 All operations including clerical office
 Lunch counters and restaurant operations to be separately rated.
 [Order 73-22, § 296-17-707, filed 11/9/73, effective 1/1/74.]

WAC 296-17-708 Classification 64-4.

Florists stores – retail
 Christmas tree sales – from lot
 All operations including clerical office.
 [Order 73-22, § 296-17-708, filed 11/9/73, effective 1/1/74.]

WAC 296-17-709 Classification 64-5.

Tire sales and service, wholesale and retail
 Tire manufacturing, vulcanizing, rebuilding and/or recapping.
 [Order 75-38, § 296-17-709, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-709, filed 11/9/73, effective 1/1/74.]

WAC 296-17-710 Classification 64-6.

Retail store risks, N.O.C.
 Camera/photo supplies stores
 Floor covering stores, excluding installation
 News butchers
 Pawn shops
 Pet shops
 Sporting goods stores – retail
 Paint/wallpaper stores – retail
 Laundromats, self service, coin operated
 Penny arcades
 Wine stores and retail liquor agencies
 Office equipment stores, excluding repair
 Fabric and yardage stores
 Dry cleaning – coin operated self service
 Musical instrument stores – retail, no pianos or organs
 Sewing machine stores – retail
 Drug stores – retail
 Variety and five and ten cent stores
 All operations including clerical office
 Lunch counters and restaurant operations to be separately rated.
 [Order 77-27, § 296-17-710, filed 11/30/77, effective 1/1/78; Order 75-38, § 296-17-710, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-710, filed 11/9/73, effective 1/1/74.]

WAC 296-17-711 Classification 64-7.

Wholesale stores, N.O.C.
 Barber and beauty supply houses
 Paint and wallpaper dealers – wholesale
 Welding supply dealers
 Mill supply dealers
 Stores, combined wholesale and retail, N.O.C.
 Drug stores wholesale
 Clothing, wearing apparel or dry goods stores wholesale

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Drivers to be separately rated under Class 11-1 (WAC 296-17-536), delivery by combined wholesale and retail stores.
 [Order 73-22, § 296-17-711, filed 11/9/73, effective 1/1/74.]

WAC 296-17-712 Classification 64-8.

Farm machinery/equipment dealers
 Farm machinery rental dealers
 Operations away from premises other than demonstration or repair to be separately rated.
 [Order 74-40, § 296-17-712, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-712, filed 11/9/73, effective 1/1/74.]

WAC 296-17-713 Classification 64-9.

Machinery/equipment dealers, N.O.C.
 Machinery rental dealers, N.O.C.
 Oil or gas well supplies or equipment dealers, not second hand
 Operations away from premises other than demonstration or repair to be separately rated.
 [Order 74-40, § 296-17-713, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-713, filed 11/9/73, effective 1/1/74.]

WAC 296-17-714 Classification 65-1.

Barber shops
 Beauty parlors
 Cosmetologists and electrolysis studios.
 [Order 73-22, § 296-17-714, filed 11/9/73, effective 1/1/74.]

WAC 296-17-715 Classification 65-2.

Banks
 Loan companies
 Savings and loan associations
 Mortgage companies
 Credit unions
 Financial institutions, N.O.C.
 Stock brokers and escrow companies
 All operations including clerical office and salesmen.
 [Order 73-22, § 296-17-715, filed 11/9/73, effective 1/1/74.]

WAC 296-17-716 Classification 65-3.

Labor unions or employee representative associations
 This class includes all employees including any official representatives
 Clerical office to be separately rated.
 [Order 75-38, § 296-17-716, filed 11/24/75, effective 1/1/76; Order 73-22, § 296-17-716, filed 11/9/73, effective 1/1/74.]

WAC 296-17-717 Classification 65-4.

Stores – welfare – all operations including clerical office
 This classification includes collecting, conditioning and resale of used donated articles of the household type

(Goodwill – Salvation Army type stores).
[Order 73-22, § 296-17-717, filed 11/9/73, effective 1/1/74.]

WAC 296-17-718 Classification 65-5.

Welfare special works program – all operations.
[Order 73-22, § 296-17-718, filed 11/9/73, effective 1/1/74.]

WAC 296-17-719 Classification 65-6.

Photograph studios
Film print shops – including developing and printing
Film exchanges
Microfilming
Includes clerical office
Outside photographers to be separately rated
Drivers to be rated under Class 11-1 (WAC 296-17-536), delivery by combined wholesale and retail stores.
[Order 73-22, § 296-17-719, filed 11/9/73, effective 1/1/74.]

WAC 296-17-720 Classification 65-7.

Private residences – outservants.
[Order 73-22, § 296-17-720, filed 11/9/73, effective 1/1/74.]

WAC 296-17-721 Classification 65-8.

Private residences – inservants.
[Order 73-22, § 296-17-721, filed 11/9/73, effective 1/1/74.]

WAC 296-17-722 Classification 65-9.

Rooming houses
Boarding houses
Foster homes
Orphanages
Boarding homes and centers, N.O.C.
Fraternity houses
Sorority houses
All operations.
[Order 73-22, § 296-17-722, filed 11/9/73, effective 1/1/74.]

WAC 296-17-723 Classification 66-1.

Detective agencies
Merchant police or patrol
Security guard agencies
All operations.
[Order 77-27, § 296-17-723, filed 11/30/77, effective 1/1/78; Order 73-22, § 296-17-723, filed 11/9/73, effective 1/1/74.]

WAC 296-17-724 Classification 66-2.

Janitorial service – does not include contract window cleaning
Janitors, N.O.C.

Termite control. This classification applies to operations involved in the control and extermination of termites and other wood-destroying pests or organisms by fumigation or spraying of poisonous insecticides. Does not include structural repair

Pest control. This classification applies to operations involved in the control and extermination of pests by the use of pesticides, rodenticides and fumigants.

[Order 73-22, § 296-17-724, filed 11/9/73, effective 1/1/74.]

WAC 296-17-725 Classification 66-3.

Auction sales
Excludes livestock sales
All operations including clerical office and salesmen.
[Order 73-22, § 296-17-725, filed 11/9/73, effective 1/1/74.]

WAC 296-17-726 Classification 66-4.

Lens manufacturing – ground and polished lenses
Optical goods manufacturing, N.O.C.
Telescope manufacturing – with lens grinding
All operations including clerical office and salesmen.
[Order 73-22, § 296-17-726, filed 11/9/73, effective 1/1/74.]

WAC 296-17-727 Classification 66-5.

Entertainers, N.O.C.
Musician, N.O.C.
Players, entertainers and musicians hired by theatres, N.O.C.
Dance halls – all employment.
[Order 77-27, § 296-17-727, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-727, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-727, filed 11/9/73, effective 1/1/74.]

WAC 296-17-729 Classification 66-7.

Card rooms and bingo parlors
Billiard halls
Recreational, social and community centers, N.O.C.
All operations including restaurant or tavern employees.
[Order 73-22, § 296-17-729, filed 11/9/73, effective 1/1/74.]

WAC 296-17-730 Classification 66-8.

Motion picture production
All operations including clerical office and salesmen.
[Order 73-22, § 296-17-730, filed 11/9/73, effective 1/1/74.]

WAC 296-17-731 Classification 66-9.

Stables, stablemen and exercise boys
Riding academies or clubs
Jockeys, N.O.C., horseshoers and trainers
Guides or pack trains.
[Order 73-22, § 296-17-731, filed 11/9/73, effective 1/1/74.]

WAC 296-17-735 Classification 67-4.

Parking lot attendants.
[Order 73-22, § 296-17-735, filed 11/9/73, effective 1/1/74.]

WAC 296-17-736 Classification 67-5.

Ski tows, ski patrols and ski instructors
Athletic officials for amateur sports, N.O.C., such as umpires, and referees
All operations.
[Order 77-27, § 296-17-736, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-736, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-736, filed 11/9/73, effective 1/1/74.]

WAC 296-17-737 Classification 67-6.

Athletic teams – operation of premises and care of teams
All employees other than players, umpires, playing coaches and managers.
[Order 75-38, § 296-17-737, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-737, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-737, filed 11/9/73, effective 1/1/74.]

WAC 296-17-738 Classification 67-7.

Football teams
Hockey teams
Roller derbies
Contact sports, N.O.C.
This class applies to professional contact sports and includes umpires, referees, playing coaches and managers.
[Order 74-40, § 296-17-738, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-738, filed 11/9/73, effective 1/1/74.]

WAC 296-17-739 Classification 67-8.

Jockeys, racing
Professional racing drivers.
[Order 77-10, § 296-17-739, filed 5/31/77; Order 74-40, § 296-17-739, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-739, filed 11/9/73, effective 1/1/74.]

WAC 296-17-740 Classification 67-9.

Sheltered workshops
All operations including clerical office and salesmen.
[Order 73-22, § 296-17-740, filed 11/9/73, effective 1/1/74.]

WAC 296-17-741 Classification 68-1.

Airlines, scheduled
All members of flying crew.
[Order 73-22, § 296-17-741, filed 11/9/73, effective 1/1/74.]

WAC 296-17-742 Classification 68-2.

Airlines, scheduled

[Title 296 WAC—p 98]

All ground crew operations.
[Order 73-22, § 296-17-742, filed 11/9/73, effective 1/1/74.]

WAC 296-17-743 Classification 68-3.

Aircraft operations, N.O.C. – all members of flying crew
Flight instruction
Private aircraft – transportation of personnel in conduct of employer's business. The rule governing standard exceptions does not apply here
Nonscheduled airlines – flight crew members.
[Order 76-36, § 296-17-743, filed 11/30/76; Order 73-22, § 296-17-743, filed 11/9/73, effective 1/1/74.]

WAC 296-17-744 Classification 68-4.

Airport operations
Aircraft ground crew operations, N.O.C.
Aircraft companies, sales or service agencies – including aircraft salesmen
Nonscheduled airlines – ground crew operations.
[Order 75-38, § 296-17-744, filed 11/24/75, effective 1/1/76; 73-22, § 296-17-744, filed 11/9/73, effective 1/1/74.]

WAC 296-17-745 Classification 68-9.

Baseball teams
Basketball teams
Soccer teams
Noncontact sports, N.O.C.
This class applies to professional noncontact sports and includes umpires, referees, playing coaches and managers.
[Order 77-10, § 296-17-745, filed 5/31/77; Order 74-40, § 296-17-745, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-745, filed 11/9/73, effective 1/1/74.]

WAC 296-17-746 Classification 69-1.

Volunteers
This class is to include all volunteers performing services for any state agency, municipal corporation, political subdivision, or private nonprofit charitable organization.
This class excludes volunteer law enforcement officers.
[Order 77-27, § 296-17-746, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-746, filed 12/1/77; Order 75-28, § 296-17-746, filed 8/29/75, effective 10/1/75.]

WAC 296-17-747 Classification 69-2.

Logging road construction or maintenance
All operations including grading, grubbing, clearing of right-of-way and including culverts and bridges. Does not include falling, bucking of right-of-way timber or any of the other logging activities as enumerated under Class 50-1 (WAC 296-17-659). Logging roads are roads for which the primary or initial usage is for the transporting of logs by truck or rail and includes roads constructed on public lands in connection with

timber sales or logging, such as roads being constructed in accordance with the State Department of Natural Resources or the U.S. Forestry Service timber sales

See Class 52-6 (WAC 296-17-675) for permanent yard operations.

[Order 75-38, § 296-17-747, filed 11/24/75, effective 1/1/76.]

WAC 296-17-748 Classification 69-3.

Aerial spraying, seeding, crop dusting, firefighting
[Order 76-36, § 296-17-748, filed 11/30/76.]

WAC 296-17-749 Classification 69-4.

Fire fighters - salaried fire fighters of municipal fire departments.

[Order 77-27, § 296-17-749, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-749, filed 12/1/77.]

WAC 296-17-750 Classification 69-5.

Law enforcement officers - law enforcement officers of cities, towns or counties

This class includes volunteer law enforcement officers, N.O.C.

[Order 77-27, § 296-17-750, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-750, filed 12/1/77.]

WAC 296-17-751 Classification 69-6.

Volunteer law enforcement officers

This class includes volunteer law enforcement officers in accordance with RCW 51.12.035.

[Order 77-27, § 296-17-751, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-751, filed 12/1/77.]

WAC 296-17-752 Classification 69-7.

Household furnishings moving and storage.

[Order 77-27, § 296-17-752, filed 11/30/77, effective 1/1/78.]

WAC 296-17-753 Classification 69-8.

Envelope or stationery manufacturing

Paper or plastic bag, abrasive paper and wallpaper manufacturing

Carbon paper, crepe paper and typewriter ribbon manufacturing.

[Order 77-27, § 296-17-753, filed 11/30/77, effective 1/1/78.]

WAC 296-17-850 Experience rating plan—Eligibility and experience period. (1) **Eligibility.** Each employer who has reported experience during more than one fiscal year of the "experience period" shall have his base rates multiplied by an "experience modification" calculated in accordance with the rules of this Manual. The development of the "experience modification" as set forth in WAC 296-17-855 shall include losses and exposure reported in all risk classes: *Provided*, That the

"experience modification" determined in accordance with WAC 296-17-855 shall not apply to industrial insurance rates in the following classes: 5-5 (WAC 296-17-520), 48-7 (WAC 296-17-648), 67-7 (WAC 296-17-738), 67-8 (WAC 296-17-739) and 68-9 (WAC 296-17-745). Employer premiums in the foregoing classes shall be computed at base industrial insurance rates as set forth in WAC 296-17-895.

(2) **Experience Period.** The "experience period" shall be the oldest three of the four fiscal years preceding the effective date of premium rates as set forth in WAC 296-17-895. [Order 76-18, § 296-17-850, filed 5/28/76, effective 7/1/76; Order 74-40, § 296-17-850, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-850, filed 11/9/73, effective 1/1/74.]

WAC 296-17-855 Experience modification. The basis of the experience modification shall be a comparison of the actual losses charged to an employer during the experience period with the losses which would be expected for an average employer reporting the same exposures in each classification. The comparison shall contain actuarial refinements designed to mitigate the effects of losses which may be considered catastrophic or of doubtful statistical significance, due consideration being given to the volume of the employer's experience. Except for those employers who qualify for use of a transition adjustment factor as specified elsewhere in this Manual, the experience modification shall be calculated from the formula:

$$\text{MODIFICATION} = \frac{A_p + W A_e - (1-W) E_e - B}{E + B}$$

The components A_p , $W A_e$, and $(1-W) E_e$ are values which shall be charged against an employer's experience record. The component, E , shall be the expected value of these charges for an average employer reporting the same exposures in each classification. The meaning and function of each symbol in the formula is specified below.

A_p signifies "primary actual losses". For each claim the primary actual loss is defined as that portion of the claim which is considered completely rateable for all employers and which is to enter the experience modification calculation at its full value. For each claim in excess of \$2000, the primary actual loss shall be determined from the formula:

$$\text{Primary loss} = \frac{10000}{\text{Total loss} + 8000} \times \text{total loss}$$

Primary actual losses for selected claim values are shown in Table I. For each claim less than \$2000 the full value of the claim shall be considered a primary loss.

A_e signifies "excess actual losses". For each claim the excess actual loss is defined as that portion of the claim which is not considered completely rateable for all employers. The excess actual loss for each claim shall be determined by subtracting the primary loss from the total loss.

W signifies "W value". For each employer, the W value determines the portion of the actual excess losses

which shall be included in the calculation of his experience modification, due consideration being given to the volume of his experience. This amount is represented by the symbol "WAc" in the experience modification formula. W values are set forth in Table II.

E signifies "expected losses". An employer's expected losses shall be determined by multiplying his reported exposure in each classification during the experience period by the classification expected loss rate. Expected loss rates are set forth in Table III.

Ee signifies "expected excess losses". Expected losses in each classification shall be multiplied by the classification "D-Ratio" to obtain "expected primary losses". Expected excess losses shall then be calculated by subtracting expected primary losses from expected total losses. Each employer shall have a statistical charge included in the calculation of his experience modification, said charge to be actuarially equivalent to the amount forgiven an average employer because of the exclusion of a portion of his excess actual losses. This charge is represented by "(1-W) Ee" in the experience modification formula. D-Ratios are set forth in Table III.

B signifies "B value" or "ballast". In order to limit the effect of a single severe accident on the modification of a small employer, a stabilizing element (B value) shall be added to both actual and expected losses. B values are set forth in Table II. [Order 77-27, § 296-17-855, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-855, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-855, filed 11/9/73, effective 1/1/74.]

WAC 296-17-860 Transition adjustment. In the event that an employer has no accidents during the experience period and the experience modification calculated in accordance with WAC 296-17-855 is greater than .85 then such modification shall be reduced to .85. [Order 74-40, § 296-17-860, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-860, filed 11/9/73, effective 1/1/74.]

WAC 296-17-865 Experience modification limitations. (1) Notwithstanding the experience modification otherwise obtained in this Manual, no employer's experience modification shall increase or decrease by more than 25% during any one year except as provided in subparagraph (2) below.

(2) The 25% limitation on the change in the experience modification shall not apply in the following cases:

(a) In cases where it would cause an employer with better than average experience during the experience period to receive an experience modification greater than 1.00.

(b) In cases where it would cause an employer with worse than average experience during the experience period to receive a modification less than 1.00.

In the above specified cases the employer's modification shall be allowed to decrease or to increase, as the case may be, to 1.00. [Order 77-27, § 296-17-865, filed 11/30/77, effective 1/1/78; Order 74-40, § 296-17-865, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-865, filed 11/9/73, effective 1/1/74.]

WAC 296-17-870 Evaluation of actual losses. Except as provided in the following subsections of this paragraph, actual losses shall include all payments and reserves as of the "valuation date" for each claim arising from an accident occurring during the experience period. Claims payments for accidents occurring outside of the experience period shall not be included. (1) **Valuation Date.** The valuation date shall be on and include December 31, one year and one day immediately preceding the effective date of premium rates as set forth in WAC 296-17-895.

(2) **Retroactive Adjustments - Revision of Losses Between Valuation Dates.** No claim value shall be revised between valuation dates and no retroactive adjustment of an experience modification shall be made because of disputation concerning the judgment of the claims examiner or because of subsequent developments except as specifically provided in the following cases:

(a) In cases where loss values are included or excluded because of clerical, mechanical or similar error.

(b) In cases where a third party recovery is made.

(c) In cases where the claim qualifies as a second injury claim under the provisions of RCW 51.16.120.

(d) In cases where a claim is officially closed and is determined to be noncompensable.

In the above specified cases retroactive adjustment of the experience modification shall be made for each rating in which the claim was included.

(3) **Average Death Value.** Each fatal claim shall be assigned the "average death value", said value to be the average incurred cost for all fatal claims occurring during the experience period. The average death value is set forth in Table II.

(4) **Third Party Recovery - Fatal Claims.** In the event of a third party recovery on a fatal claim, the employer shall be charged for a portion of the "average death value", said portion to be determined by taking the ratio of the total cost of the claim, including attorneys' fees, after recovery, to the total cost of the claim before recovery. Both the primary and excess components of the average death value shall be reduced in the same proportion.

(5) **Second Injury Claims.** The primary and excess values of any claim which becomes eligible for second injury relief under the provisions of RCW 51.16.120, as now or hereafter amended, shall be reduced by the percentage of relief granted.

(6) **Occupational Disease Claims.** When a claim results from an employee's exposure to an occupational disease hazard, the "date of injury", for the purposes of experience rating, shall be the date on which the disability was diagnosed, giving rise to the filing of a claim for benefits. The cost of any occupational disease claim, paid from the accident fund and arising from exposure to the disease hazard under two or more employers, shall be prorated to each period of employment involving exposure to the hazard. Each insured employer who had employed the claimant during the experience period shall be charged for his share of the claim based upon the prorated costs.

(7) **Maximum Claim Value.** No claim shall enter an employer's experience record at a value greater than the

"maximum claim value". The maximum claim value is set forth in Table II. [Order 75-38, § 296-17-870, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-870, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-870, filed 11/9/73, effective 1/1/74.]

WAC 296-17-875 Table I.

Primary Losses for Selected Claim Values

Claim Value	Primary Loss
2,000	2,000
2,667	2,500
3,429	3,000
4,308	3,500
5,333	4,000
6,545	4,500
8,000	5,000
9,778	5,500
12,000	6,000
14,857	6,500
18,667	7,000
24,000	7,500
32,000	8,000
45,333	8,500
51,722*	8,660
110,000**	9,322

* Average death value

** Maximum claim value

[Order 77-27, § 296-17-875, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-875, filed 11/30/76; Order 75-38, § 296-17-875, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-875, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-875, filed 11/9/73, effective 1/1/74.]

WAC 296-17-880 Table II.

"B" and "W" Values

Maximum Claim Value = \$110,000

Average Death Value = \$51,722

Expected Losses	B	W
25,000 & Under	20,000	0
25,001 - 35,859	19,800	.01
35,860 - 46,717	19,600	.02
46,718 - 57,576	19,400	.03
57,577 - 68,434	19,200	.04
68,435 - 79,293	19,000	.05
79,294 - 90,152	18,800	.06
90,153 - 101,010	18,600	.07
101,011 - 111,869	18,400	.08
111,870 - 122,727	18,200	.09
122,728 - 133,586	18,000	.10
133,587 - 144,444	17,800	.11
144,445 - 155,303	17,600	.12
155,304 - 166,162	17,400	.13
166,163 - 177,020	17,200	.14
177,021 - 187,879	17,000	.15
187,880 - 198,737	16,800	.16
198,738 - 209,596	16,600	.17

Expected Losses	B	W
209,597 - 220,455	16,400	.18
220,456 - 231,313	16,200	.19
231,314 - 242,172	16,000	.20
242,173 - 253,030	15,800	.21
253,031 - 263,889	15,600	.22
263,890 - 274,747	15,400	.23
274,748 - 285,606	15,200	.24
285,607 - 296,465	15,000	.25
296,466 - 307,323	14,800	.26
307,324 - 318,182	14,600	.27
318,183 - 329,040	14,400	.28
329,041 - 339,899	14,200	.29
339,900 - 350,758	14,000	.30
350,759 - 361,616	13,800	.31
361,617 - 372,475	13,600	.32
372,476 - 383,333	13,400	.33
383,334 - 394,192	13,200	.34
394,193 - 405,051	13,000	.35
405,052 - 415,909	12,800	.36
415,910 - 426,768	12,600	.37
426,769 - 437,626	12,400	.38
437,627 - 448,485	12,200	.39
448,486 - 459,343	12,000	.40
459,344 - 470,202	11,800	.41
470,203 - 481,061	11,600	.42
481,062 - 491,919	11,400	.43
491,920 - 502,778	11,200	.44
502,779 - 513,636	11,000	.45
513,637 - 524,495	10,800	.46
524,496 - 535,354	10,600	.47
535,355 - 546,212	10,400	.48
546,213 - 557,071	10,200	.49
557,072 - 567,929	10,000	.50
567,930 - 578,788	9,800	.51
578,789 - 589,646	9,600	.52
589,647 - 600,505	9,400	.53
600,506 - 611,364	9,200	.54
611,365 - 622,222	9,000	.55
622,223 - 633,081	8,800	.56
633,082 - 643,939	8,600	.57
643,940 - 654,798	8,400	.58
654,799 - 665,657	8,200	.59
665,658 - 676,515	8,000	.60
676,516 - 687,374	7,800	.61
687,375 - 698,232	7,600	.62
698,233 - 709,091	7,400	.63
709,092 - 719,949	7,200	.64
719,950 - 730,808	7,000	.65
730,809 - 741,667	6,800	.66
741,668 - 752,525	6,600	.67
752,526 - 763,384	6,400	.68
763,385 - 774,242	6,200	.69
774,243 - 785,101	6,000	.70
785,102 - 795,960	5,800	.71
795,961 - 806,818	5,600	.72
806,819 - 817,677	5,400	.73
817,678 - 828,535	5,200	.74
828,536 - 839,394	5,000	.75
839,395 - 850,253	4,800	.76
850,254 - 861,111	4,600	.77

Expected Losses	B	W	Class	1974	1975	1976	D-Ratio
861,112 - 871,970	4,400	.78	6-3	.1278	.1453	.1401	.416
871,971 - 882,828	4,200	.79	6-4	.2849	.3240	.3123	.397
882,829 - 893,687	4,000	.80	6-6	.0571	.0649	.0626	.422
893,688 - 904,545	3,800	.81	6-7	.0625	.0711	.0685	.450
904,546 - 915,404	3,600	.82	7-1	.1795	.2042	.1968	.419
915,405 - 926,263	3,400	.83	8-3	.0829	.0943	.0909	.395
926,264 - 937,121	3,200	.84	8-4	.1878	.2136	.2059	.309
937,122 - 947,980	3,000	.85	8-6	.0709	.0806	.0777	.331
947,981 - 958,838	2,800	.86	9-1	.2372	.2698	.2601	.359
958,839 - 969,697	2,600	.87	9-2	.1262	.1435	.1383	.456
969,698 - 980,556	2,400	.88	10-2	.2807	.3192	.3077	.402
980,557 - 991,414	2,200	.89	10-3	.1891	.2151	.2073	.401
991,415 - 1,002,273	2,000	.90	11-1	.1135	.1291	.1244	.393
1,002,274 - 1,013,131	1,800	.91	11-2	.1928	.2192	.2113	.372
1,013,132 - 1,023,990	1,600	.92	11-3	.0698	.0794	.0765	.420
1,023,991 - 1,034,848	1,400	.93	13-1	.0657	.0747	.0720	.411
1,034,849 - 1,045,707	1,200	.94	13-3	.0266	.0303	.0292	.385
1,045,708 - 1,056,566	1,000	.95	13-4	.0025	.0028	.0027	.428
1,056,567 - 1,067,424	800	.96	14-1	.1088	.1237	.1192	.350
1,067,425 - 1,078,283	600	.97	14-3	.0808	.0919	.0885	.353
1,078,284 - 1,089,141	400	.98	14-4	.0808	.0919	.0885	.353
1,089,142 - 1,100,000	200	.99	15-1	.0787	.0896	.0863	.370
1,100,001 & over	0	1.00	15-7	.0709	.0806	.0777	.331
[Order 77-27, § 296-17-880, filed 11/30/77, effective 1/1/78; Order 76-36, § 296-17-880, filed 11/30/76; Order 75-38, § 296-17-880, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-880, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-880, filed 11/9/73, effective 1/1/74.]			16-2	.4988	.5674	.5469	.345
			17-1	.4988	.5674	.5469	.345
			17-2	.4988	.5674	.5469	.345
			17-3	.0976	.1110	.1070	.319
			17-4	.0732	.0832	.0802	.319
			18-1	.1308	.1488	.1434	.432
			18-2	.1308	.1488	.1434	.432
			18-3	.1308	.1488	.1434	.432
			20-2	.0640	.0728	.0701	.395
			20-3	.0753	.0857	.0826	.398
			20-4	.0762	.0867	.0836	.390
			20-5	.0634	.0721	.0695	.386
			20-6	.0753	.0857	.0826	.398
			20-7	.0671	.0763	.0736	.407
			20-8	.0637	.0725	.0699	.371
			21-1	.0732	.0832	.0802	.458
			21-2	.0753	.0857	.0826	.398
			21-4	.0608	.0691	.0666	.502
			22-1	.0518	.0589	.0567	.433
			22-2	.0501	.0570	.0550	.406
			24-1	.0968	.1101	.1061	.409
			29-3	.1290	.1468	.1415	.431
			29-4	.1104	.1255	.1210	.455
			29-6	.1290	.1468	.1415	.431
			31-1	.1513	.1721	.1659	.362
			31-2	.1513	.1721	.1659	.362
			31-3	.1138	.1294	.1247	.365
			31-4	.1513	.1721	.1659	.362
			31-5	.1587	.1805	.1740	.443
			33-1	.1144	.1301	.1254	.449
			33-8	.0363	.0413	.0398	.480
			33-9	.0676	.0769	.0741	.424
			34-1	.0761	.0866	.0835	.375
			34-2	.1095	.1246	.1201	.398
			34-3	.0177	.0201	.0194	.371
			34-4	.0736	.0838	.0807	.432
			34-6	.0370	.0420	.0405	.426

WAC 296-17-885 Table III.

Expected Loss Rates and D-Ratios
 Expected Loss Rates in Dollars Per Workman Hour
 For Indicated Fiscal Year

Class	1974	1975	1976	D-Ratio
1-1	.2571	.2924	.2818	.319
1-2	.2432	.2766	.2666	.312
1-3	.2119	.2411	.2324	.377
1-4	.2187	.2488	.2398	.311
1-5	.2125	.2418	.2330	.349
1-6	.2021	.2299	.2216	.312
1-9	.2487	.2829	.2727	.347
2-1	.4474	.5089	.4905	.336
2-2	.4586	.5216	.5027	.357
3-1	.1031	.1173	.1131	.426
3-2	.2435	.2769	.2669	.379
3-6	.1105	.1257	.1212	.410
3-7	.0979	.1113	.1073	.401
4-1	.2952	.3358	.3236	.325
4-2	.2952	.3358	.3236	.325
4-3	.2634	.2996	.2888	.345
5-2	.2169	.2467	.2378	.396
5-3	.1179	.1341	.1292	.385
5-4	.1719	.1955	.1884	.361
5-5	.2640	.3003	.2894	.363
5-8	.2311	.2628	.2533	.380
6-1	.0780	.0888	.0855	.373
6-2	.1074	.1222	.1178	.347

Workmen's Compensation Insurance

296-17-885

Class	1974	1975	1976	D-Ratio	Class	1974	1975	1976	D-Ratio
34-7	.0490	.0558	.0537	.441	48-3	.1041	.1184	.1141	.469
34-8	.0244	.0278	.0267	.367	48-4	.0662	.0752	.0725	.459
35-1	.0548	.0623	.0601	.509	48-5	.0540	.0615	.0593	.386
35-3	.0482	.0549	.0529	.509	48-6	.0113	.0128	.0124	.401
35-4	.0465	.0529	.0510	.420	48-7	.2640	.3003	.2894	.363
35-5	.0548	.0623	.0601	.509	48-8	.0643	.0732	.0705	.435
35-6	.1403	.1596	.1538	.389	49-1	.0132	.0150	.0145	.416
35-7	.0548	.0623	.0601	.509	49-2	.0337	.0383	.0369	.379
35-8	.0479	.0544	.0525	.515	49-3	.0132	.0150	.0145	.416
36-1	.0736	.0838	.0807	.432	49-4	.0031	.0036	.0035	.405
36-2	.0465	.0529	.0510	.420	49-5	.0526	.0598	.0576	.421
36-3	.0615	.0700	.0675	.429	49-6	.0122	.0139	.0134	.412
36-4	.1136	.1293	.1246	.359	49-7	.0271	.0309	.0297	.386
36-5	.0626	.0712	.0687	.397	49-8	.0702	.0798	.0770	.385
36-6	.0823	.0936	.0902	.503	49-9	.0702	.0798	.0770	.385
37-1	.0304	.0346	.0333	.391	50-1	.4741	.5392	.5197	.363
37-2	.0667	.0758	.0731	.460	50-2	.0850	.0966	.0932	.464
37-3	.0304	.0346	.0333	.391	51-1	.0986	.1121	.1081	.472
37-6	.0489	.0556	.0536	.382	51-2	.1274	.1449	.1397	.426
37-7	.0489	.0556	.0536	.382	51-3	.1274	.1449	.1397	.426
37-8	.0489	.0556	.0536	.382	51-4	.1095	.1246	.1201	.398
38-1	.0489	.0556	.0536	.382	51-5	.1095	.1246	.1201	.398
38-2	.0318	.0362	.0348	.455	51-6	.1095	.1246	.1201	.398
38-3	.0318	.0362	.0348	.455	51-7	.1095	.1246	.1201	.398
38-4	.0318	.0362	.0348	.455	51-8	.1095	.1246	.1201	.398
38-5	.0318	.0362	.0348	.455	51-9	.0851	.0968	.0933	.403
38-6	.0318	.0362	.0348	.455	52-1	.1095	.1246	.1201	.398
38-7	.0318	.0362	.0348	.455	52-2	.1095	.1246	.1201	.398
38-8	.0318	.0362	.0348	.455	52-3	.1095	.1246	.1201	.398
38-9	.0318	.0362	.0348	.455	52-4	.1410	.1604	.1546	.416
39-1	.0761	.0865	.0834	.417	52-5	.1095	.1246	.1201	.398
39-2	.1065	.1212	.1168	.405	52-6	.0801	.0911	.0879	.402
39-3	.1578	.1795	.1730	.443	52-7	.0329	.0374	.0361	.398
39-4	.1065	.1212	.1168	.405	53-1	.0031	.0036	.0035	.405
39-5	.0352	.0400	.0385	.449	53-5	.0057	.0065	.0063	.311
40-2	.0891	.1013	.0977	.448	53-6	.0049	.0055	.0053	.419
41-1	.0201	.0228	.0220	.486	61-3	.0078	.0088	.0085	.442
41-2	.0194	.0221	.0213	.486	61-4	.0676	.0769	.0741	.393
41-3	.0201	.0228	.0220	.486	61-5	.0317	.0360	.0347	.438
41-4	.0193	.0220	.0212	.486	61-6	.0437	.0497	.0479	.405
41-5	.0194	.0221	.0213	.486	61-7	.0337	.0383	.0369	.412
41-6	.0194	.0221	.0213	.486	61-8	.0621	.0706	.0680	.522
41-7	.0185	.0211	.0203	.486	61-9	.0077	.0088	.0085	.437
41-8	.0194	.0221	.0213	.486	62-1	.0369	.0420	.0405	.361
41-9	.0191	.0217	.0209	.486	62-2	.0996	.1133	.1092	.408
42-1	.1377	.1566	.1510	.361	62-3	.0254	.0289	.0278	.386
43-1	.1563	.1777	.1713	.425	62-4	.0340	.0386	.0372	.429
43-2	.1504	.1710	.1649	.376	62-5	.0340	.0386	.0372	.429
43-3	.1498	.1704	.1643	.405	62-6	.0340	.0386	.0372	.429
43-4	.1517	.1726	.1663	.396	62-7	.1559	.1773	.1709	.421
43-5	.2591	.2947	.2841	.433	62-8	.0890	.1012	.0975	.310
44-1	.0941	.1070	.1032	.373	62-9	.0399	.0454	.0438	.459
44-4	.0753	.0857	.0826	.398	63-1	.0280	.0318	.0307	.324
45-1	.0264	.0300	.0289	.295	63-2	.0402	.0457	.0441	.416
45-2	.0164	.0187	.0180	.277	63-3	.0147	.0167	.0161	.343
45-3	.0475	.0541	.0521	.347	63-4	.0225	.0255	.0246	.410
45-4	.0153	.0174	.0168	.401	63-5	.0094	.0107	.0103	.456
46-1	.0302	.0344	.0332	.339	63-6	.0516	.0587	.0566	.349
47-1	.0302	.0344	.0332	.339	63-7	.0175	.0199	.0191	.427
48-2	.0632	.0719	.0693	.359	63-8	.0115	.0131	.0126	.390

Class	1974	1975	1976	D-Ratio
63-9	.0232	.0264	.0254	.416
64-1	.0175	.0199	.0191	.427
64-2	.0617	.0701	.0676	.334
64-3	.0301	.0343	.0330	.424
64-4	.0111	.0127	.0122	.409
64-5	.0363	.0413	.0398	.480
64-6	.0174	.0198	.0191	.430
64-7	.0301	.0342	.0330	.491
64-8	.0706	.0803	.0774	.423
64-9	.0788	.0896	.0864	.413
65-1	.0086	.0098	.0094	.469
65-2	.0039	.0044	.0042	.362
65-3	.0253	.0288	.0277	.301
65-4	.0347	.0394	.0380	.452
65-5	.0271	.0309	.0297	.323
65-6	.0101	.0115	.0111	.421
65-7	.0599	.0681	.0657	.406
65-8	.0393	.0447	.0431	.431
65-9	.0386	.0439	.0423	.382
66-1	.0469	.0533	.0514	.347
66-2	.0832	.0946	.0912	.432
66-3	.0440	.0501	.0483	.442
66-4	.0163	.0185	.0179	.400
66-5	.0381	.0434	.0418	.368
66-6	.0381	.0434	.0418	.368
66-7	.0329	.0374	.0361	.398
66-8	.0684	.0778	.0750	.387
66-9	.1627	.1851	.1784	.490
67-1	.0132	.0150	.0145	.416
67-2	.0132	.0150	.0145	.416
67-3	.2119	.2411	.2324	.377
67-4	.0370	.0420	.0405	.426
67-5	.1381	.1571	.1514	.406
67-6	.0555	.0632	.0609	.382
67-7	5.52*	6.28*	6.06*	.460
67-8	2.14	2.43	2.35	.523
67-9	.0313	.0356	.0343	.415
68-1	.1329	.1512	.1458	.366
68-2	.0680	.0774	.0746	.498
68-3	.9023	1.0263	.9892	.256
68-4	.0735	.0836	.0806	.389
68-9	.1962	.2231	.2151	.418
69-2	.2634	.2996	.2888	.360
69-3	1.4924	1.6974	1.6361	.249
69-4	.1435	.1633	.1574	.410
69-5	.1435	.1633	.1574	.410
69-7	.1738	.1976	.1905	.341
69-8	.0685	.0779	.0751	.409

[*Daily expected loss rate]

[Order 77-27, § 296-17-885, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-885, filed 12/1/77; Order 77-10, § 296-17-885, filed 5/31/77; Order 76-36, § 296-17-885, filed 11/30/76; Order 76-18, § 296-17-885, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-885, filed 11/24/75, effective 1/1/76; Order 74-40, § 296-17-885, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-885, filed 11/9/73, effective 1/1/74.]

Reviser's Note: RCW 34.04.058 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 296-17-895 Industrial insurance accident fund base rates and medical aid rates by class of industry. Industrial insurance accident fund base rates and medical aid rates by class of industry shall be as set forth below.

Rates Effective January 1, 1978		
Class	Accident Fund Base Rate	Medical Aid Fund Rate
1-1	.6859	.2367
1-2	.6488	.1942
1-3	.5655	.2387
1-4	.5836	.2138
1-5	.5671	.2335
1-6	.5393	.2415
1-9	.6636	.2667
2-1	1.1937	.3897
2-2	1.2235	.3825
3-1	.2752	.1509
3-2	.6496	.2776
3-6	.2949	.1718
3-7	.2612	.1474
4-1	.7876	.2604
4-2	.7876	.2604
4-3	.7029	.2851
5-2	.5788	.2136
5-3	.3145	.2100
5-4	.4586	.2719
5-5	.7044	.2857
5-8	.6165	.3774
6-1	.2082	.1314
6-2	.2866	.1519
6-3	.3409	.1897
6-4	.7601	.3832
6-6	.1523	.1185
6-7	.1667	.1089
7-1	.4790	.2279
8-3	.2213	.1178
8-4	.5011	.2218
9-1	.6329	.2245
9-2	.3366	.1658
10-2	.7488	.3280
10-3	.5045	.2126
11-1	.3028	.1836
11-2	.5143	.2329
11-3	.1862	.1219
13-1	.1752	.1098
13-3	.0710	.0485
13-4	.0066	.0053
14-1	.2902	.1239
14-3	.2155	.0717
14-4	.2155	.0717
15-1	.2101	.1139
15-7	.1891	.1061

Workmen's Compensation Insurance

296-17-895

Rates Effective
January 1, 1978

Rates Effective
January 1, 1978

Class	Rates Effective January 1, 1978		Class	Rates Effective January 1, 1978	
	Accident Fund Base Rate	Medical Aid Fund Rate		Accident Fund Base Rate	Medical Aid Fund Rate
17-1	1.3309	.3580	38-4	.0848	.0578
17-2	1.3309	.5560	38-5	.0848	.0578
17-3	.2604	.2010	38-6	.0848	.0578
17-4	.1952	.1824	38-8	.0848	.0578
18-1	.3491	.1494	38-9	.0848	.0578
20-2	.1707	.1007	39-1	.2030	.1003
20-3	.2010	.1237	39-2	.2842	.1372
20-4	.2034	.1590	39-3	.4211	.2452
20-5	.1692	.1102	39-4	.2842	.1372
20-6	.2010	.1237	39-5	.0938	.0688
20-7	.1790	.1154	40-2	.2377	.1224
20-8	.1700	.1028	41-1	.0536	.0421
21-1	.1952	.1428	41-2	.0518	.0421
21-2	.2010	.1237	41-3	.0536	.0421
21-4	.1622	.0979	41-4	.0515	.0421
22-1	.1381	.0677	41-5	.0518	.0421
22-2	.1338	.0732	41-6	.0518	.0421
24-1	.2582	.1273	41-7	.0494	.0421
29-3	.3443	.1914	41-8	.0518	.0421
29-4	.2945	.1730	41-9	.0509	.0421
29-6	.3443	.1914	42-1	.3674	.1552
31-1	.4038	.1993	43-1	.4169	.2254
31-2	.4038	.1993	43-2	.4012	.1718
31-3	.3036	.1399	43-3	.3998	.1839
31-4	.4038	.1993	43-4	.4048	.2267
31-5	.4234	.1972	43-5	.6913	.3013
33-1	.3053	.1723	44-1	.2511	.1091
33-9	.1803	.1208	44-4	.2010	.1237
34-1	.2031	.1199	45-1	.0704	.0398
34-2	.2922	.1820	45-2	.0438	.0181
34-3	.0472	.0221	45-3	.1268	.0647
34-4	.1965	.1358	45-4	.0409	.0268
34-6	.0986	.0841	46-1	.0807	.1285
34-7	.1308	.0887	48-2	.1686	.0608
34-8	.0651	.0427	48-3	.2778	.1575
35-1	.1462	.1249	48-4	.1765	.1132
35-3	.1287	.1273	48-5	.1442	.0899
35-4	.1240	.0749	48-6	.0301	.0193
35-6	.3743	.1767	48-7	.7044	.2857
35-8	.1277	.1190	48-8	.1716	.1191
36-1	.1965	.1358	49-1	.0352	.0264
36-2	.1240	.0749	49-2	.0898	.0410
36-3	.1642	.1294	49-3	.0352	.0264
36-4	.3032	.1900	49-4	.0084	.0059
36-5	.1671	.0960	49-5	.1403	.0828
36-6	.2195	.1934	49-6	.0325	.0209
37-1	.0811	.0576	49-7	.0724	.0448
37-2	.1779	.1252	49-8	.1873	.0889
37-3	.0811	.0576	49-9	.1873	.0889
37-6	.1305	.0748	50-1	1.2649	.5032
37-7	.1305	.0748	50-2	.2267	.1727
37-8	.1305	.0748	51-1	.2630	.1997
38-1	.1305	.0748	51-2	.3400	.2018
38-2	.0848	.0578	51-3	.3400	.2018
38-3	.0848	.0578	51-4	.2922	.1820

Rates Effective
January 1, 1978Rates Effective
January 1, 1978

Class	Rates Effective January 1, 1978		Class	Rates Effective January 1, 1978	
	Accident Fund Base Rate	Medical Aid Fund Rate		Accident Fund Base Rate	Medical Aid Fund Rate
51-5	.2922	.1820	65-9	.1029	.0636
51-6	.2922	.1820	66-1	.1251	.0526
51-7	.2922	.1820	66-2	.2220	.0987
51-8	.2922	.1820	66-3	.1175	.0629
51-9	.2271	.1428	66-4	.0435	.0274
52-1	.2922	.1820	66-5	.1017	.0370
52-2	.2922	.1820	66-7	.0878	.0534
52-3	.2922	.1820	66-8	.1825	.0751
52-4	.3763	.1589	66-9	.4341	.2952
52-5	.2922	.1820	67-4	.0986	.0665
52-6	.2138	.1288	67-5	.3685	.2891
52-7	.0878	.0534	67-6	.1482	.0743
53-1	.0084	.0059	67-7	14.74*	6.96*
53-5	.0153	.0095	67-8	5.71	1.98
53-6	.0130	.0101	67-9	.0834	.0763
61-3	.0207	.0184	68-1	.3479	.1168
61-4	.1804	.0982	68-2	.1815	.1230
61-5	.0845	.0547	68-3	1.9619	.5571
61-6	.1165	.1034	68-4	.1961	.0930
61-7	.0898	.0549	68-9	.5234	.8717
61-8	.1656	.1234	69-1	-	.0384
61-9	.0206	.0143	69-2	.7028	.1936
62-1	.0985	.0512	69-3	3.1253	.8875
62-2	.2658	.1443	69-4	.3830	.2096
62-3	.0677	.0338	69-5	.3830	.2096
62-4	.0906	.0630	69-6	-	.2096
62-5	.0906	.0630	69-7	.4636	.2193
62-6	.0906	.0630	69-8	.1828	.0901
62-7	.4159	.3335			
62-8	.2374	.0994			
62-9	.1065	.0915			
63-1	.0747	.0369			
63-2	.1073	.0491			
63-3	.0392	.0212			
63-4	.0599	.0454			
63-5	.0251	.0178			
63-6	.1378	.0778			
63-8	.0307	.0137			
63-9	.0619	.0433			
64-2	.1645	.0730			
64-3	.0804	.0622			
64-4	.0297	.0209			
64-5	.0968	.0832			
64-6	.0464	.0316			
64-7	.0803	.0672			
64-8	.1883	.1261			
64-9	.2102	.1599			
65-1	.0229	.0156			
65-2	.0103	.0061			
65-3	.0675	.0209			
65-4	.0925	.1049			
65-5	.0724	.0340			
65-6	.0270	.0141			
65-7	.1598	.0875			
65-8	.1049	.0607			

[*Daily rate]

[Order 77-27, § 296-17-895, filed 11/30/77, effective 1/1/78; Emergency Order 77-25, § 296-17-895, filed 12/1/77; Order 77-10, § 296-17-895, filed 5/31/77; Order 76-36, § 296-17-895, filed 11/30/76; Order 76-18, § 296-17-895, filed 5/28/76, effective 7/1/76; Order 75-38, § 296-17-895, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-895, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-895, filed 11/27/74, effective 1/1/75; Order 73-22, § 296-17-895, filed 11/9/73, effective 1/1/74.]

Reviser's Note: RCW 34.04.058 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 296-17-900 Premium discounts. In providing a rate modification system consistent with recognized insurance principles, the department may, in addition to the experience rating plan, provide a premium discount plan which recognizes the differences in administrative expense to the department in collecting premiums from employers based on differences in their premium volume. [Order 73-22, § 296-17-900, filed 11/9/73, effective 1/1/74.]

WAC 296-17-905 Dividends. Periodically, the department shall determine the total liability existing against the accident fund. If, after such determination, the department finds the accident fund, aside from the reserves deemed actuarially necessary according to recognized insurance principles, contains a surplus, the director, in his discretion may declare a dividend to be paid to, or credited to the accounts of, employers who were insured with the department during all or part of the period for which the dividend is declared, according to a uniform formula to be promulgated by the department. Any dividends so declared shall give due consideration to the solvency of the accident fund, not be unfairly discriminatory, and not be promised in advance of such declaration. [Order 73-22, § 296-17-905, filed 11/9/73, effective 1/1/74.]

WAC 296-17-910 Qualifications for employer groups for workmen's compensation insurance. The department may insure the workmen's compensation obligations of employers as a group, provided the following conditions are met:

(1) All the employers in the group are members of an organization that has been in existence for at least two years.

(2) The organization was formed for a purpose other than that of obtaining workmen's compensation coverage.

(3) The occupations of the employers in the organization are substantially similar, taking into consideration the nature of the services being performed by workmen of such employers.

(4) The employers in the group constitute at least fifty percent of the total employers in such organization, unless the total number of workmen to be covered in the group exceeds 500, in which event the employers in the group must constitute at least twenty-five percent of all employers in the organization.

(5) The formation and operation of the group program in the organization will substantially improve accident prevention and claims handling for the employers in the group.

In providing employer group plans under this rule, the department may consider an employer group as a single employing entity for purposes of dividends or premium discounts. [Order 73-22, § 296-17-910, filed 11/9/73, effective 1/1/74.]

WAC 296-17-920 Assessment for supplemental pension fund. The amount of 10.5 mills (\$.0105) shall be retained by each employer from the earnings of each of his workmen for each hour of [or] fraction thereof the workman is employed. Provided that in classification 67-7 the employer shall retain eight cents per man-day from each of his workmen. The amount of money so retained from the employee shall be matched in an equal amount by each employer, except as otherwise provided in these rules, all such monies shall be remitted to the department on or before the last day of January, April, July and October of each year for the preceding calendar quarter. All such monies shall be deposited in the supplemental pension fund. [Order 77-27, § 296-17-

920, filed 11/30/77, effective 1/1/78; Order 77-10, § 296-17-920, filed 5/31/77; Order 76-36, § 296-17-920, filed 11/30/76; Order 75-38, § 296-17-920, filed 11/24/75, effective 1/1/76; Order 75-28, § 296-17-920, filed 8/29/75, effective 10/1/75; Order 74-40, § 296-17-920, filed 11/27/74, effective 1/1/75; Order 74-6, § 296-17-920, filed 1/23/74.]

WAC 296-17-930 Volunteers. Any city, county, school district, municipal corporation or any other political subdivision, or private nonprofit charitable organization electing to insure volunteers under the authority of RCW 51.12.035 as now or hereafter amended shall give notice in writing on a form prescribed by the department. Any employer having elected to insure volunteers shall maintain office records of all hours of work performed by volunteers. Such office records shall include notice in writing as a registration of each person who has volunteered and has been accepted by the employer to perform work as a volunteer. A report of such hours will be included with the employer's regular quarterly report of payroll as prescribed by the department, and will include payment for the premium based on such hours and at such rates per hour as assigned by the department. [Order 77-27, § 296-17-930, filed 11/30/77, effective 1/1/78; Order 75-28, § 296-17-930, filed 8/29/75, effective 10/1/75.]

Chapter 296-19 WAC

CLASSIFICATION OF STATE EMPLOYEES

WAC

296-19-010 General order.

WAC 296-19-010 General order. (1) It is hereby declared and ordered that the state of Washington through any and all of its departments, divisions, boards, commissions and committees, or other agencies created by the state constitution and/or any legislative action, is engaged in an extrahazardous occupation in relation to all of its officers and employees, and therefore, subject to the compulsory provisions of the workmen's compensation act, effective April 1, 1961;

(2) With the exception of the following officers and employees—

(a) The members of the legislature, the members of their immediate staffs, and any person employed immediately preceding, during, and immediately following the legislative session, to perform duties pertaining solely to that session.

(b) Commissioned and enlisted personnel of the military service of the state.

(c) Inmate employees.

(d) Professional consultants.

(e) Employees and officers whose employment is occasional, at infrequent intervals, and for a limited or temporary purpose. [Rule, filed 4/10/62; Rules, filed 12/2/60 and 3/6/61.]

Chapter 296-20 WAC

MEDICAL AID RULES

WAC

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296-20-690	Permanent impairments of the cervico-dorsal (WAC 296-20-240) and lumbosacral regions (WAC 296-20-280) jointly.

Reviser's note: Chapter 296-20 WAC previously codified WAC 296-20-010 through 296-20-735 "PHYSICIANS MEDICAL AID RULES AND FEES" which were filed 9/17/64. Such rules were de-codified as apparently superseded by similar rules filed 7/20/66 which were published in Supplement #2 (7/1/68) as an appendix to this chapter. The 1966 rules were expressly repealed by Order 68-7 codified herein as chapters 296-20, 296-21, 296-22 and 296-23 WAC.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-20-040	Modalities not requiring prior authorization after sixty days. [Order 68-7, § 296-20-040, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71.
296-20-050	Periodical clinical reports. [Order 68-7, § 296-20-050, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-061.
296-20-060	Fees for concurrent treatment. [Order 68-7, § 296-20-060, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-071.
296-20-061	Periodic clinical progress reports. [Order 71-6, § 296-20-061, filed 6/1/71; Order 70-12, § 296-20-061, filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-050.] Repealed by Order 74-39, filed 11/22/74.
296-20-070	Consultations. [Order 68-7, § 296-20-070, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-051.
296-20-080	Private room—Special nurses. [Order 68-7, § 296-20-080, filed 11/27/68, effective 1/1/69.] Repealed

- by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-091.
- 296-20-090 Reopenings. [Order 68-7, § 296-20-090, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-097.
- 296-20-095 Unrelated elective surgery. [Order 68-7, § 296-20-095, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71. Later promulgation, see WAC 296-20-081.
- 296-20-105 Laboratory. [Order 68-7, § 296-20-105, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71.
- 296-20-130 Medical aid contracts. [Order 74-7, § 296-20-130, filed 1/30/74; Order 70-12, § 296-20-130, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-130, filed 11/27/68, effective 1/1/69.] Repealed by Order 77-27, filed 11/30/77, effective 1/1/78.
- 296-20-131 Advance authorization required for nonstandard treatment. [Order 74-7, § 296-20-131, filed 1/30/74.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
- 296-20-14001 Conversion factor table—Hospital. [Order 75-39, § 296-20-14001, filed 11/28/75, effective 1/1/76.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.

WAC 296-20-010 General instructions. (1) Fees cover services and reports in all cases that can qualify for worker's compensation benefits. This Fee Schedule is intended to cover all examinations, reports and treatment.

(2) The maximum fee is determined by multiplying the unit value of a procedure by a conversion factor. Individual conversion factor tables apply to separate sections of the Maximum Fee Schedule when such an item or procedure is used in the care and treatment of an industrial injury.

(3) Initial and follow-up visit charges by physicians shall include services such as, but not limited to, routine physical modalities, injections, minor procedures, etc., not otherwise provided for in the schedule.

(4) Provision is made in this Fee Schedule for payment for procedures involving complications. Detailed instructions are contained in the section on Surgery concerning the information required when the value of procedures contained in that section are to be determined "By Report." When the value of procedures in other sections of this Fee Schedule are to be determined "By Report," the report must contain a detailed description of the services rendered, the time involved in rendering the service, complications, other complicating factors or unusual skills required.

(5) Communications to the department or self-insurer must show the patient's full name and claim number if known. If the claim number is unknown, in addition to the patient's name, show the date and the nature of the injury and the employer's name. A communication should refer to one claim only. Correspondence regarding medical services should be sent directly to the department in Olympia or self-insurer in order to avoid rehandling by the service location.

(6) **LIGHT WORK:** The attending physician is urged to bear in mind that light work is frequently beneficial for body conditioning and the gaining of self-confidence. Accordingly, where light work is available and whenever an employer requests that a worker be certified by a

physician as able to perform available work other than his usual work, the employer shall furnish to the physician, with a copy to the worker, a statement describing the available work in terms that will enable the physician to relate the physical activities of the job to the worker's disability. The physician shall then determine whether the worker is physically able to perform the work described.

(7) **REGULAR WORK:** When the attending physician determines that the patient is capable of returning to his regular work he should be informed and the department or self-insurer notified as to the specific date. Compensation will be terminated on this date. Further medical care will be allowed as indicated by the physician.

(8) **TERMINATION OF MEDICAL CARE:** When medical care is no longer required and the industrial condition stabilized, a report should be submitted to the department or self-insurer to this effect stating the specific date. This is necessary for closure of the industrial claim, even though the patient may require continued medical care for conditions not related to the industrial condition.

(9) **PERMANENT DISABILITY:** When the patient has, in the opinion of the attending physician, a permanent partial disability or measurable impairment of function, a report of this opinion with the findings and estimate of the functional impairment for specified disabilities, (i.e. Loss of function of the left hand equivalent to mid-metacarpal amputation of the hand, etc.) should be submitted by the attending physician. An estimate of the functional impairment for unspecified disabilities should be submitted by indicating which of the categories listed in WAC 296-20-200 through 296-20-660 best describes the impairment. If for any reason the ratings cannot be accomplished by the attending physician, the department must be requested to make arrangement for this determination through special examination. Where the rating is accomplished by the attending physician, much inconvenience and delay can be avoided in the payment of any disability awards and the final processing of the claim.

(10) **UNUSUAL OR UNLISTED PROCEDURE:** Value of unlisted services or procedures and additional values for unusual services or procedures which may necessitate skills and time of the physician over and above listed services or procedures should be substantiated "By Report" (BR).

(11) **"BY REPORT":** "BR" (By Report) in the value column indicates that the value of this service is to be determined by report (BR) because the service is too unusual, variable or new to be assigned a unit value. The report should provide an adequate definition or description of the services or procedure (e.g., operative or narrative report), using any of the following as indicated:

- (a) Diagnosis;
- (b) Size, location and number of lesion(s) or procedure(s) where appropriate;
- (c) Major surgical procedure and supplementary procedure(s);
- (d) Whenever possible, list the nearest similar procedure by number according to this schedule;

(e) Estimated follow-up;

(f) Operative time.

(12) "INDEPENDENT PROCEDURE": Certain of the listed procedures are commonly carried out as an integral part of a total service, and as such do not warrant a separate charge. When such a procedure is carried out as a separate entity, not immediately related to other services, the indicated value for "Independent Procedure" is applicable.

(13) "Sv ITEMS": "Sv" in the column indicates the value is to be calculated as the sum of the various services rendered, (e.g., office, hospital or nursing home visit, consultation or detention, etc.) according to the ground rules covering those services. Identify by using the code number of the "Sv" item. Value by identifying each individual service, listing its code number and value.

(14) This is a maximum fee schedule. All fees listed are the maximum fees allowable and if a fee for any particular service is lower to the general public than listed in the fee schedule, the practitioner shall bill the department or self-insurer at the lower rate.

(15) The following rules are promulgated pursuant to RCW 51.04.020. [Order 76-34, § 296-20-010, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-010, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-010, filed 1/30/74; Order 70-12, § 296-20-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-010, filed 11/27/68, effective 1/1/69.]

WAC 296-20-01001 Medical advisory industrial insurance committee. (1) The Washington state medical association shall appoint an advisory and utilization review committee composed of nine members, one of whom shall be an osteopathic physician nominated by the Washington state osteopathic medical association. The remaining members should be selected from the following specialty groups: Family or general practice, orthopaedics, neurology or neurosurgery, general surgery, physical medicine and rehabilitation, psychiatry, internal medicine, and industrial medicine.

(2) The committee will function as an advisor to the department with respect to policies affecting medical care and rehabilitation, quality control and supervision of medical care, and the establishment of rules and regulations. It shall also advise and assist the department in the resolution of controversies, disputes and problems between the department and the providers of medical care. It will also advise and assist the department in the education of members of the medical community with regard to the roles of the physician, the department and the employer in providing the needs and care of the injured worker.

(3) The committee shall normally meet on a monthly basis or as necessity dictates. The department will reimburse members of the committee for each meeting. [Order 77-27, § 296-20-01001, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-20-01001, filed 12/1/77; Emergency Order 77-16, § 296-20-01001, filed 9/6/77; Order 76-34, § 296-20-01001, filed 11/24/76, effective 1/1/77.]

WAC 296-20-015 Who may treat. All licensed physicians; except those under suspension by the department, are eligible to treat injured workers entitled to benefits under the Industrial Insurance Law. Only that treatment which falls within the scope and field of the physician's license to practice will be allowed as treatment to an injured worker.

Procedures and evaluations requiring specialized skills and knowledge will be limited to board certified or board qualified physicians, as specified by the American Medical Association or the American Osteopathic Association. No physician shall be formally refused permission to treat cases coming under the jurisdiction of the department, except for reasons that are, in the opinion of the department, to the best interest of the workers and the funds created for their protection.

Reasons for holding a physician ineligible to treat Industrial Insurance cases include, but are not necessarily limited to any one or a combination of the following:

(1) Failure, neglect or refusal to submit complete, adequate and detailed reports.

(2) Failure, neglect or refusal to respond to requests by the department for additional reports.

(3) Failure, neglect or refusal to observe and comply with the department's orders and Medical Aid Rules.

(4) Failure to notify the department immediately and prior to burial in any death where the cause of death is not definitely known or where there is question of death being due to an industrial injury.

(5) Persistent failure to recognize emotional and social factors impeding recovery of the injured worker.

(6) Persistent unreasonable refusal to comply with the recommendations of board certified or qualified specialists who have examined the worker.

(7) Submission of false or misleading reports to the department.

(8) Collusion with any other persons in submission of false or misleading information to the department.

(9) Submission of inaccurate or misleading bills.

(10) Persistent submission of false or erroneous diagnosis.

(11) Knowingly submitting bills to an injured worker for treatment of an industrial condition for which the department has accepted responsibility.

(12) Treatment of a nonspecific nature not medically indicated or treatment of a controversial or experimental nature or the use of contraindicated or hazardous treatment measures or frequent, unsatisfactory results of treatment.

(13) Charging or attempting to charge industrially injured workers any fee for the care of conditions for which the department or self-insurer has accepted responsibility.

(14) Conviction in any court of any offense involving moral turpitude, in which case the record of such conviction shall be conclusive evidence.

(15) The use or prescription for use, of narcotic, addictive, habituating or dependency producing drugs in any way other than for therapeutic purposes.

(16) Repeated acts of gross misconduct in the practice of the profession.

(17) Declaration of mental incompetency by a court of competent jurisdiction. [Order 76-34, § 296-20-015, filed 11/24/76; effective 1/1/77; Order 74-4, § 296-20-015, filed 1/30/74; Order 71-6, § 296-20-015, filed 6/1/71; Order 70-12, § 296-20-015, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-015, filed 11/27/68, effective 1/1/69.]

WAC 296-20-020 Acceptance of rules and fees. The filing of an accident report or the rendering of treatment to an injured worker who comes under the department's or self-insurer's jurisdiction, as the case may be, constitutes acceptance of the department's Medical Aid Rules and shall comply with its rules and fees.

In accordance with RCW 51.28.020 of the Industrial Insurance Law, when a physician renders treatment to an injured worker entitled to benefits under the law, "it shall be the duty of the physician to inform the injured workman of his rights under this title and to lend all necessary assistance in making the application for compensation and such proof of other matters as required by the rules of the department without charge to the workman," an injured worker shall not be billed for treatment rendered for his industrial injury or occupational disease.

When an unrelated condition is being treated concurrently with an industrial injury, the department shall be notified immediately by the treating physician, of the nature of the unrelated condition and the treatment being rendered and the effect, if any, on the patient's recovery from the industrial injury.

In cases of questionable beneficiary where the treating physician has billed the injured worker, and the claim is subsequently allowed, the physician shall refund the injured worker in full and bill the department or self-insurer for services rendered at department rates.

Cases in which there is a question of medical ethics or quality of medical care, will be referred to the Washington State Medical Association's Medical Advisory and Utilization Review Committee to the Department of Labor and Industries for recommendations. [Order 76-34, § 296-20-020, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-020, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-20-020, filed 11/22/74, effective 1/1/75; Order 71-6, § 296-20-020, filed 6/1/71; Order 70-12, § 296-20-020, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-020, filed 11/27/68, effective 1/1/69.]

WAC 296-20-02001 Penalties. RCW 51.48.060 of the Industrial Insurance Law provides that a civil penalty of \$100.00 may be assessed against any physician who; ". . . fails, neglects or refuses to file a report with the Director, as required by this title, within five days of treatment showing the condition of the injured workman at the time of treatment, a description of the treatment given, and an estimate of the probable duration of the injury, or who fails or refuses to render all necessary assistance to the injured workman, as required by this title, . . ."

RCW 51.48.080 of the Industrial Insurance Law provides that, "Every person, firm or corporation who violates or fails to obey, observe or comply with any rule of the department promulgated under authority of this title, shall be subject to a penalty of not to exceed two hundred and fifty dollars." [Order 76-34, § 296-20-02001, filed 11/24/76, effective 1/1/77.]

WAC 296-20-025 Initial treatment and report of accident. It is the responsibility of each practitioner accepting an industrial injury for treatment, to ascertain whether he is the first attending physician. If not, he must refer the workman to the original physician, unless the workman desires to be transferred to his care. In this event, approval for the transfer must be obtained in accordance with WAC 296-20-065. If the practitioner is the first attending physician, he will take the following action:

(1) Give emergency treatment.

(2) Immediately complete and forward the report of accident, to the department and the employer. Instruct and give assistance to the injured workman in completing his portion of the report of accident. The following information is necessary so that there is no delay in adjudication of the claim or payment of compensation.

(a) Complete history of the industrial accident.

(b) Complete listing of positive physical findings.

(c) Specific diagnosis relating to the injury.

(d) Type of treatment rendered.

(e) Known medical, emotional or social conditions which may influence recovery or cause complications.

(f) Estimate time loss due to the injury.

(3) If the patient remains under your care continue with necessary treatment in accordance with Medical Aid Rules. [Order 71-6, § 296-20-025, filed 6/1/71; Order 70-12, § 296-20-025, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-025, filed 11/27/68, effective 1/1/69.]

WAC 296-20-030 Treatment following initial treatment—Treatment not requiring authorization. (1) ALL CASES

(a) Up to ten office calls for the treatment of the industrial condition, during the first thirty days.

(b) X-rays necessary for evaluation and treatment of the industrial injury. No payment will be made for unnecessary x-rays.

(c) Physical therapy on hospitalized patients or outpatient physical therapy as indicated, upon written prescription by the attending physician. A Physical Therapy Progress Report must be submitted to the attending physician and the department or self-insurer, in accordance with the Physical Therapy Rules in WAC 296-23-710. USE OF DIAPULSE, THERMATIC (standard model only), SPECTROWAVE AND SUPERPULSE MACHINES AND IONTOPHORESIS IS NOT AUTHORIZED FOR WORKERS ENTITLED TO BENEFITS UNDER THE INDUSTRIAL INSURANCE ACT.

(d) Laboratory studies reasonably necessary for diagnosis and treatment of the industrial condition.

(e) Routine minor and emergency service and other recognized noncontroversial medical treatment measures, not otherwise requiring authorization.

(f) Consultation with specialist when indicated.

(g) Drugs and medications during the acute phase of the industrial injury. Addictive, habit forming or dependency producing drugs may be prescribed in quantities sufficient for treatment for a maximum of fifteen days. If drug therapy is to extend beyond thirty days, a special report justifying the clinical necessity for this treatment must be submitted to the department or self-insurer.

(h) Diagnostic or therapeutic nerve blocks, when necessary for the industrial injury, not to exceed once weekly during the first thirty days following injury.

(i) Intra-articular, para-articular and parenteral injections, for the industrial condition, except fibrosing agents, not to exceed once weekly during the first thirty days. INJECTIONS OF VITAMIN B-12 WILL BE AUTHORIZED ONLY FOR TREATMENT OF PERNICIOUS ANEMIA.

(j) Myelogram and discogram, if done within thirty days from the date of injury.

(2) TIME LOSS CASES. This is in addition to those listed above.

(a) Hospitalization. Hospitalization solely for physical therapy is not authorized. Token medical treatment will not alter this.

(b) Hospital calls during period of hospitalization.

(c) Physical therapy as indicated during hospitalization.

(d) Emergency surgery for the industrial condition.

(3) NO TIME LOSS CASES. This is in addition to those listed above.

(a) Routine treatment during the first 60 days or until closure is indicated, whichever occurs first. [Order 76-34, § 296-20-030, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-030, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-030, filed 1/30/74; Order 71-6, § 296-20-030, filed 6/1/71; Order 70-12, § 296-20-030, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-030, filed 11/27/68, effective 1/1/69.]

WAC 296-20-03001 Treatment requiring authorization—All cases. (1) Office calls in excess of the first ten.

(2) Elective major surgery (See WAC 296-20-045)

(3) X-ray and radium therapy.

(4) Specific diagnostic service—Codes 92000-95980.

(5) Myelogram and discogram, unless carried out within thirty days from the date of injury.

(6) Physical Therapy. Advance authorization on an individual basis is required in remote isolated areas where there is no Registered Physical Therapist or Physical Therapist Assistant serving under the direction of a Registered Physical Therapist, and physical therapy is to be given in a physician's office, hospital or nurse practitioner clinic by other than a Registered Physical Therapist. USE OF DIAPULSE OR SIMILAR MACHINE ON PERSONS UNDER THE JURISDICTION OF THE DEPARTMENT OR SELF-INSURER IS NOT AUTHORIZED.

(7) Diagnostic or therapeutic nerve blocks subsequent to the first thirty days following injury, or in excess of once weekly.

(8) Intra-articular, para-articular and parenteral injections subsequent to the first thirty days following injury, or in excess of once weekly. INJECTION OF VITAMIN B-12 WILL BE AUTHORIZED ONLY FOR TREATMENT OF PERNICIOUS ANEMIA.

(9) Prior approval is required for injections of all fibrosing or sclerosing agents. The fibrosing or sclerosing agents to be employed, the reason for treatment and the areas to be treated must be included on the request for authorization.

(10) Treatment measures of an unusual, controversial, complicated, obsolete or experimental nature (see WAC 296-20-045 and 296-20-131) must be approved in advance by the department. Requests for approval of such treatment must contain a description of the treatment, the reason for its employment, its benefits and the expected results. [Order 76-34, § 296-20-03001, filed 11/24/76, effective 1/1/77.]

WAC 296-20-03002 Treatment not authorized. (1) USE OF DIAPULSE, THERMATIC (standard model only), SPECTROWAVE AND SUPERPULSE MACHINES ON WORKERS ENTITLED TO BENEFITS UNDER THE INDUSTRIAL INSURANCE ACT IS NOT AUTHORIZED.

(2) Injections of Vitamin B-12 for treatment of conditions other than pernicious anemia.

(3) Any treatment measure, including physical therapy, as a palliative measure will not be allowed or paid. [Order 76-34, § 296-20-03002, filed 11/24/76, effective 1/1/77.]

WAC 296-20-03003 Drugs and medication. (1) The department is experiencing a significant increase in incidence of drug dependency and return-to-work apathy from use of addicting and habituating drugs. In response to this, the Washington State Medical Association's Industrial Insurance Committee issued "Guidelines to Assist Attending Physicians in the Care of Industrially Injured Workers Receiving Addictive, Habituating or Dependency Producing Drugs." This rule is based on those guidelines.

(2) Agents responsible for producing dependency and return-to-work apathy when used over a short period of time, i.e. sixty to ninety days are: Antianxiety drugs, sedatives, antidepressants, antipsychotics and oral or injectable natural or synthetic narcotics and other habituating or addictive drugs.

(3) Both antianxiety drugs and sedatives aggravate the depression which often occurs naturally in the injured worker. This makes return of self-esteem and return to work difficult. Their widespread use as "muscle relaxants" is being increasingly questioned. If these drugs are used after industrial injury, it should be on a short-term basis under careful observation. These include but are not limited to:

Antianxiety Drugs: Including, but not limited to, Valium, Librium, Tranxene, Serax, Meprobamate.

Sedatives: Including, but not limited to, short-acting Barbituates, Dalmane, Doriden, Quaalude, etc.

(4) The adverse effects reported for antidepressants and antipsychotics should be considered before prescribing. The manufacturer's precautions should be carefully observed. Psychiatric consultation is recommended if used longer than sixty days. These are:

(a) Antidepressants—

(i) Tricyclics - Elavil, Tofranil, Sinequan, Vivactil, Norpramin, Pertofrance, etc.

(ii) Amphetamines: Are Schedule II substances under the jurisdiction of the federal controlled substances act and will not be allowed or paid by the department of labor and industries.

(b) Antipsychotics—

(i) Phenothiazines, including but not limited to, Thorazine, Stelazine, Compazine, and Mellaril.

(ii) Butyrophenones, including but not limited to, Haldol and Innovar.

(5) Injectable natural or synthetic narcotics and talwin should be used as indicated on hospitalized patients only. No prescriptions for injectable forms of these drugs (nor syringes) should be written on department of labor and industries prescription forms.

(6) Oral natural or synthetic narcotics. Talwin and other habituating or addictive drugs should be used as indicated for acute pain, but not longer than sixty days. Their use for the relief of pain behavior and "suffering" is being increasingly questioned.

(7) The department realizes that management of chronic pain cases is most difficult subjecting the physician to extreme pressures. With this in mind, the following guidelines are suggested with the intent that they will help the doctor cope with the pressures and assist in the management of these difficult cases:

(a) Keep a drug summary on all claimants.

(b) Determine if pain complaints are consistent with the amount of injury.

(c) Write specific instructions for the use of sedatives and analgesics.

(d) Treat the natural depression in injured workers properly, avoiding tranquilizers, and sedatives which increase depression.

(e) Evaluate recovery time frequently, and allow patient to regain self-esteem by returning to work.

(f) If a patient is requiring these drugs in amounts sufficient to cause concern about habituation or addiction or for longer than sixty days, the attending physician should:

(i) Revise the treatment plan and withdraw the drugs.

(ii) If unable to treat addiction or habituation himself, refer the patient to a physician or an institution experienced in drug withdrawal.

(iii) If (i) and (ii) are not acceptable or appropriate, obtain unbiased concurring opinion, and justify an alternate course in writing to the department of labor and industries and the federal drug enforcement administration.

(8) The department will inform the attending physician when it is concerned about the amount of these drugs the patient is receiving and will provide information regarding physicians and institutions experienced in

drug withdrawal. [Order 77-27, § 296-20-03003, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-03003, filed 11/24/76, effective 1/1/77.]

WAC 296-20-035 Treatment in cases that remain unable to work beyond sixty days. (New injuries only) Conditions requiring treatment beyond sixty days are indicative of a major industrial condition or complication by other medical pathology. Except in cases of severe and extensive injuries, when the workman is unable to return to work within sixty days, the department may request a complete medical examination to determine and/or establish:

(1) What, if any, other preexisting or concurrent medical conditions exist in addition to the industrial injury.

(2) What effect, if any, the unrelated conditions have on the industrial injury.

(3) The full extent, diagnosis, probable duration, anticipated treatment and prognosis of these conditions.

If this cannot be carried out by the attending physician, he must arrange this examination by another physician of his choice. The attending physician must provide the consultant with the history, x-rays if on hand and a resume of treatment rendered. The fee will be paid on the basis of the written report under WAC 296-21-030.

This examination must contain:

(1) A DETAILED HISTORY TO ESTABLISH:

(a) The type and severity of the injury.

(b) The patient's previous physical and mental health.

(c) Any social and emotional factors which may effect recovery.

(2) If the examination is by other than the attending physician, a comparison of the history provided by the attending physician with the history given by the injured workman.

(3) A DETAILED PHYSICAL EXAMINATION concerning all systems affected by the industrial accident.

(4) A GENERAL PHYSICAL EXAMINATION sufficient to demonstrate any preexisting impairments of function.

(5) A COMPLETE DIAGNOSIS OF ALL PATHOLOGICAL CONDITIONS FOUND TO BE LISTED AS:

(a) Due solely to injury.

(b) Preexisting condition aggravated by the injury and the extent of aggravation.

(c) Other medical conditions neither related to nor aggravated by the injury but which may retard recovery.

(d) Coexisting disease not a departmental problem (arthritis, congenital deformities, heart disease, etc.).

(6) CONCLUSIONS MUST INCLUDE:

(a) Type treatment recommended for each pathological condition and the probable duration of treatment.

(b) Expected degree of recovery from the industrial condition.

(c) Probability, if any, of permanent disability resulting from the industrial condition.

(d) Probability of returning to work.

(7) REPORTS OF NECESSARY, REASONABLE X-RAY AND LABORATORY STUDIES TO establish or confirm the diagnosis when indicated. [Order 71-6, § 296-20-035, filed 6/1/71; Order 70-12, § 296-20-035, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-035, filed 11/27/68, effective 1/1/69.]

WAC 296-20-045 Procedures requiring consultation. In the event of complication, controversy, or dispute over the medical aspects of any claim, the department will not authorize treatment until the attending physician has arranged a consultation with a qualified physician in whom he has confidence, and the department has received notification of the findings and recommendations of the consultant. This consultation must be arranged in accordance with WAC 296-20-051.

Consultation is also required in the following cases:

(1) All repeat elective major surgery, except inguinal hernia.

(2) All elective major surgery on a patient with serious medical, emotional or social problems which are likely to complicate recovery.

(3) All procedures of a controversial nature or type not in common use for the specific condition.

(4) Surgical cases where there are complications or unfavorable circumstances such as age, preexisting conditions or interference with occupational requirements, etc. [Order 71-6, § 296-20-045, filed 6/1/71; Order 70-12, § 296-20-045, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-045, filed 11/27/68, effective 1/1/69.]

WAC 296-20-051 Consultations. In cases presenting diagnostic or therapeutic problems to the attending physician, consultation with a specialist will be allowed without prior authorization. The consultant must submit his findings and recommendations immediately to the attending physician and the department.

Whenever possible, the referring physician should make his x-rays and records available to the consultant to avoid the necessity of duplication. Consultants may proceed with indicated and reasonable x-rays or laboratory work and reasonable diagnostic studies.

Consultations will be held with a specialist within a reasonable geographic area.

The attending physician will not arrange a consultation if he has received notification of a Special or Commission Examination being arranged by the department. If he has had recent consultation and is notified that the department is arranging an examination, he must immediately advise the department of the consultation.

The consultation fee will be paid only if a consultation report is complete and contains all pathological findings as well as all pertinent negative or normal findings. The report must be received in the department within fifteen days from the date of the consultation. [Order 71-6, § 296-20-051, filed 6/1/71; Order 70-12, § 296-20-051, filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-070.]

WAC 296-20-055 Scope of treatment. Medical conditions preexisting the injury or occupational disease are not the responsibility of the department. Temporary treatment of an unrelated condition may be allowed, upon prior approval by the department, provided these conditions directly retard recovery of the accepted condition. The department will not approve or pay for treatment for a known preexisting unrelated condition for which the claimant was receiving treatment prior to his industrial injury or occupational disease, which is not retarding recovery of his industrial condition.

A thorough explanation of how the unrelated condition is affecting the industrial condition must be included with the request for authorization.

The department will not pay for treatment of an unrelated condition when it no longer exerts any influence upon the accepted industrial condition. When treatment of an unrelated condition is being rendered, reports must be submitted monthly outlining the effect of treatment on both the unrelated and the accepted industrial conditions.

THE DEPARTMENT WILL NOT PAY FOR TREATMENT FOR UNRELATED CONDITIONS UNLESS IT HAS BEEN PREVIOUSLY AUTHORIZED BY THE DEPARTMENT. This includes prescription drugs and medications. [Order 71-6, § 296-20-055, filed 6/1/71; Order 70-12, § 296-20-055, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-055, filed 11/27/68, effective 1/1/69.]

WAC 296-20-06101 Doctor's supplemental report. The department of self-insurer will make periodic requests for the doctor to submit a supplemental report. When requesting a report the department or self-insurer will forward a "Doctor's Supplemental Report" form to be completed and returned to the department or self-insurer. It is intended that this report contain sufficient information to allow the department to authorize treatment, pay time loss compensation and medical bills without requiring additional correspondence from the doctor. When the report is completed in adequate detail for this purpose and returned promptly, the department or the self-insurer, as the case may be, will pay for its completion. Billing for the report must be submitted in accordance with the procedures outlined in WAC 296-20-125. [Order 74-39, § 296-20-06101, filed 11/22/74, effective 1/1/75.]

WAC 296-20-065 Transfer of physicians. All transfers from one physician to another must be approved by the department or self-insurer. Normally transfers will be allowed only after the worker has been under the care of the attending physician for sufficient time for the doctor to complete necessary diagnostic studies, to establish an appropriate treatment regimen and to evaluate the efficacy of the therapeutic course. X-rays in these cases will be forwarded to the new attending physician.

The department or self-insurer reserves the right to require a worker to select another physician or specialist for treatment, under the following conditions:

(1) When more conveniently located physicians, qualified to provide the necessary treatment, are available.

(2) When the attending physician fails to cooperate in observance and compliance with the department rules.

(3) In time loss cases where reasonable progress towards return to work is not shown.

(4) Cases requiring specialized treatment, which the attending physician is not qualified to render.

(5) Where the department or self-insurer finds a transfer of physicians to be appropriate and has requested the workman to transfer in accordance with this rule, the department or self-insurer may select a new attending physician if the worker unreasonably refuses or delays in selecting another attending physician.

(6) In cases where the physician is qualified to treat each of several conditions which the attending physician is not qualified to treat.

Transfers will be authorized for the foregoing reasons or where the department or self-insurer in its discretion finds that a transfer is in the best interest of returning the injured worker to a productive role in society.

When a flat fee case is transferred to another physician it is the responsibility of the two physicians involved to determine the proper apportionment of the total fee for the flat fee procedure. It shall be the responsibility of the operating physician to advise the department or self-insurer of the proportion of the post-operative care provided by each physician and the fee distribution. Each physician must submit a separate bill to the department or self-insurer for his portion of the care. No payment will be made until this apportionment has been received by the department or self-insurer. If no agreement can be reached between the two physicians concerning the fee distribution, the matter will be referred to the Washington State Medical Association's Medical Advisory and Utilization Review Committee to the department of labor and industries. [Order 77-27, § 296-20-065, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-20-065, filed 12/1/77; Emergency Order 77-16, § 296-20-065, filed 9/6/77; Order 75-39, § 296-20-065, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-065, filed 1/30/74; Order 71-6, § 296-20-065, filed 6/1/71; Order 70-12, § 296-20-065, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-065, filed 11/27/68, effective 1/1/69.]

WAC 296-20-071 Concurrent treatment. Treatment by more than one physician concurrently will be allowed only when the conditions resulting from the injury involve more than one system requiring specialty care, and when approved by the attending physician. When more than one physician are providing care, the department or self-insurer shall designate one as the attending physician who shall be responsible for directing care, including all prescriptions provided. [Order 75-39, § 296-20-071, filed 11/28/75, effective 1/1/76; Order 70-12, § 296-20-071, filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-060.]

WAC 296-20-075 Hospitalization. Hospitalization is allowed for those cases in which the care of the patient is of such complicated or exacting nature that it

would be detrimental to his treatment and recovery if not hospitalized. Need for hospitalization must be justified by report.

When a case no longer requires care in an acute care hospital, arrangements must be made with the department for transferring the patient to a convalescent facility or a nursing home until he is ready for discharge to his home.

Discharge of the patient from the hospital shall be at the earliest date possible consistent with proper medical care. [Order 71-6, § 296-20-075, filed 6/1/71; Order 70-12, § 296-20-075, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-075, filed 11/27/68, effective 1/1/69.]

WAC 296-20-081 Unrelated elective surgery. Elective surgery for an unrelated condition is not normally permitted during hospitalization for an industrial condition. Under some circumstances unrelated elective surgery may be permitted through prior agreement and approval by the department. [Order 70-12, § 296-20-081, filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-095.]

WAC 296-20-085 Isolation of infected cases. Department approval for isolation as a preventive measure will be granted only upon medical justification by the attending physician. Use of a private room for isolation will be allowed only when no other facility for isolation is available. [Order 71-6, § 296-20-085, filed 6/1/71; Order 70-12, § 296-20-085, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-085, filed 11/27/68, effective 1/1/69.]

WAC 296-20-091 Private room—Special nurses. In a critical case where special nurses, a private room or intensive care are indicated the attending physician may order these services, subject to later department approval of the claim, without prior authorization. The department should be notified immediately by collect telephone. [Order 71-6, § 296-20-091, filed 6/1/71; Order 70-12, § 296-20-091, filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-080.]

WAC 296-20-097 Reopenings. After a claim has been closed for sixty days, a reopening thereof requires the submission of a formal "Application to Reopen Claim for Aggravation of Condition". Diagnostic studies associated with the reopening application will be allowed. If granted, necessary treatment rendered prior to the submission of the application will be accepted by the department. Necessary treatment should not be deferred pending a decision upon the application by the department. [Order 71-6, § 296-20-097, filed 6/1/71; Order 70-12, § 296-20-095 (codified as WAC 296-20-097), filed 12/1/70, effective 1/1/71. Formerly WAC 296-20-090.]

WAC 296-20-100 Eye glasses and refractions. The department shall be liable only for the cost of restoring damaged eye glasses to their condition at the time of the accident.

Lenses broken or lost in an industrial accident are replaceable by the department. Refraction to replace a broken lens in [is] only payable when the report substantiates that the prescription could not be obtained from the broken lens or is not available elsewhere. If the prescription is available, and the patient needs a new refraction, he is responsible for the costs of the refraction.

If a refractive error is due to the injury, refraction and glasses will be authorized by the department. [Order 71-6, § 296-20-100, filed 6/1/71; Order 70-12, § 296-20-100, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-100, filed 11/27/68, effective 1/1/69.]

WAC 296-20-110 Dental. Only dentists licensed in the state in which they practice are eligible to treat cases under the Medical Aid Act.

If only a dental injury is involved, the physician's portion of the report of accident must be completed by the dentist to whom the patient first reports. If the accident report has been submitted by another physician, the dentist's report may be made by letter.

The department is responsible only for repair or replacement of teeth injured or dentures broken as a result of an industrial accident. The patient must be so advised.

Bills covering the cost of dentures should be submitted for the denture only and should not include the cost for subsequent relining. If relining becomes necessary, authorization for relining must be obtained in advance from the department.

Bills must be submitted to the department within sixty days from the date that service is rendered. Bills must itemize the service rendered, the materials used and it must be accompanied by a dental chart illustrating the teeth insured. [Order 70-12, § 296-20-110, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-110, filed 11/27/68, effective 1/1/69.]

WAC 296-20-115 Flat fees. The values for procedures listed in the surgical section of the Fee Schedule include the surgical procedure and the "follow-up days". Necessary follow-up care beyond this period is to be added on a fee-for-service basis.

When post-operative care is to be provided by other than the operating surgeon, it shall be the responsibility of the two physicians involved to determine the appropriate apportionment of the total fee for the flat fee procedure. It shall be the responsibility of the operating surgeon to advise the department of the proportion of the post-operative care provided by each physician and the fee distribution. Each physician must submit a separate bill to the department for his portion of the care. No payment will be made until notice of the apportionment has been received by the department. In the event that no agreement can be reached concerning the distribution of the fee, the matter will be referred to the Washington State Medical Association's Medical Advisory and Utilization Review Committee to the Department of Labor and Industries. [Order 71-6, § 296-20-115, filed 6/1/71; Order 70-12, § 296-20-115, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-115, filed 11/27/68, effective 1/1/69.]

WAC 296-20-120 Procedures not listed in this schedule. Procedures not specifically listed will be given values comparable to those of the listed procedures of closest similarity. The operative record or a written report of the procedure must be submitted. [Order 71-6, § 296-20-120, filed 6/1/71; Order 70-12, § 296-20-120, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-120, filed 11/27/68, effective 1/1/69.]

WAC 296-20-121 X-rays. Radiographs are required for comparison and interpretation in determining permanent disability, other administrative or legal decisions, and for cases in litigation hence must be available to the department, the self-insurer and/or the board of industrial insurance appeals on request. X-rays must be retained and available for seven years by the physician.

When a physician's office is closed because of death, retirement or leaving the state, department approved custodial arrangements must be made to insure availability on request. [Order 77-27, § 296-20-121, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-20-121, filed 12/1/77; Emergency Order 77-16, § 296-20-121, filed 9/6/77; Order 74-39, § 296-20-121, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-20-121, filed 1/30/74.]

WAC 296-20-124 Rejected and closed claims. (1) Except for services requested by the department or the self-insurer or diagnostic procedures forming the basis for action on a claim, no payment for treatment or medication will be made in claims for which responsibility has not been accepted (rejected).

(2) When a claim is closed the only services for which payment will be made are those services requested by the department or the self-insurer and/or the examination, along with necessary diagnostic procedures, in connection with the submission of an application to reopen a claim for aggravation. [Order 76-34, § 296-20-124, filed 11/24/76, effective 1/1/77.]

WAC 296-20-125 Billing procedures. (1) Bills must be itemized on department or self-insurer forms as the case may be, specifying the date, type of service and charges for each service.

(2) A copy of the prescription, with the physician's signature, must accompany all bills for medication.

(3) The bill form must be completed in detail to include the claim number. The account number and name of the practitioner rendering service must be included on the bill. Bills will be accepted when signed by other than the practitioner rendering service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges rests with the practitioner rendering the service.

(4) For a bill to be considered for payment, it must be received in the department or by the self-insurer within ninety days from the date of each specific treatment and/or services or procedures rendered or performed. Bills for flat fee procedures may be exempt from this ninety day requirement under the following conditions:

(a) When the flat fee period exceeds ninety days, the bill must be received in the department or by the self-insurer prior to the expiration of the flat fee period.

A complete narrative interpretation of the x-rays must be submitted with the bill.

(5) Bills for x-ray services must be submitted in conformance with the fee specified in the fee schedule, for the particular service.

(6) Payment will not be made for excessive or unnecessary x-rays. No payment will be made for x-rays taken on rejected or closed claims except as outlined in paragraph (8) below.

(7) Bills for laboratory work must be accompanied by copies of the reports of findings.

(8) Except for services requested by the department or self-insurer, completion of a reopening examination and application (see Code 90089) along with any necessary diagnostic procedures are the only services for which payment may be made while the claim is closed. **UNDER NO CIRCUMSTANCES CAN BILLS BE PAID FOR ANY OTHER SERVICES RENDERED WHILE A CLAIM IS CLOSED.**

(9) The department or the self-insurer may reject bills for services rendered in violation of the medical aid rules.

(10) The emergency room will be considered the office for those physicians providing regular emergency room care to the hospital, and fees will be allowed on this basis.

(11) The claim number must be placed on each bill and on each page of attached documents. [Order 77-27, § 296-20-125, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-20-125, filed 12/1/77; Emergency Order 77-16, § 296-20-125, filed 9/6/77; Order 75-39, § 296-20-125, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-20-125, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-20-125, filed 1/30/74; Order 71-6, § 296-20-125, filed 6/1/71; Order 70-12, § 296-20-125, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-20-125, filed 11/27/68, effective 1/1/69.]

WAC 296-20-135 Conversion factor table—Medicine, chiropractic, physical therapy, drugless therapeutics and nurse practitioner sections. This table is a conversion of fee schedule unit values to fees in dollar amounts at \$0.79 per unit. This conversion factor is to be applied to the medicine section of the fee schedule, the chiropractic, physical therapy, drugless therapeutic and nurse practitioner sections.

Unit Value	@\$.79	Unit Value	@\$.79	Unit Value	@\$.79
.1	.08	5.0	3.95	9.9	7.43
.2	.16	5.1	4.07	10.0	7.50
.3	.24	5.2	4.11	10.5	8.30
.4	.32	5.3	4.19	11.0	8.69
.5	.40	5.4	4.27	11.5	9.09
.6	.47	5.5	4.35	12.0	9.48
.7	.55	5.6	4.42	12.5	9.88
.8	.63	5.7	4.50	13.0	10.27
.9	.71	5.8	4.58	13.5	10.67
1.0	.79	5.9	4.66	14.0	11.06
1.1	.87	6.0	4.74	14.5	11.46

Unit Value	@\$.79	Unit Value	@\$.79	Unit Value	@\$.79
1.2	.95	6.1	4.82	15.0	11.85
1.3	1.03	6.2	4.90	16.0	12.64
1.4	1.11	6.3	4.98	17.0	13.43
1.5	1.19	6.4	5.06	18.0	14.22
1.6	1.26	6.5	5.14	19.0	15.01
1.7	1.34	6.6	5.21	20.0	15.80
1.8	1.42	6.7	5.29	21.0	16.59
1.9	1.50	6.8	5.37	22.0	17.38
2.0	1.58	6.9	5.45	23.0	18.17
2.1	1.66	7.0	5.53	24.0	18.96
2.2	1.74	7.1	5.61	25.0	19.75
2.3	1.82	7.2	5.69	30.0	23.70
2.4	1.90	7.3	5.77	35.0	27.65
2.5	1.98	7.4	5.85	40.0	31.60
2.6	2.05	7.5	5.93	45.0	35.55
2.7	2.13	7.6	6.00	50.0	39.50
2.8	2.21	7.7	6.08	55.0	43.45
2.9	2.29	7.8	6.16	60.0	47.40
3.0	2.37	7.9	6.24	65.0	51.35
3.1	2.45	8.0	6.32	70.0	55.30
3.2	2.53	8.1	6.40	75.0	59.25
3.3	2.61	8.2	6.48	80.0	63.20
3.4	2.69	8.3	6.56	85.0	67.15
3.5	2.77	8.4	6.64	90.0	71.10
3.6	2.84	8.5	6.72	95.0	75.05
3.7	2.92	8.6	6.79	100.0	79.00
3.8	3.00	8.7	6.87	105.0	82.95
3.9	3.08	8.8	6.95	110.0	86.90
4.0	3.16	8.9	7.03	115.0	90.85
4.1	3.24	9.0	7.11	120.0	94.80
4.2	3.32	9.1	7.19	125.0	98.75
4.3	3.40	9.2	7.27	130.0	102.70
4.4	3.48	9.3	7.35	140.0	110.60
4.5	3.56	9.4	7.43	150.0	118.50
4.6	3.63	9.5	7.51	160.0	126.40
4.7	3.71	9.6	7.58	170.0	134.30
4.8	3.79	9.7	7.66	180.0	142.20
4.9	3.87	9.8	7.74	190.0	150.10
				200.0	158.00

[Order 77-27, § 296-20-135, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-135, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-135, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-135, filed 1/30/74; Order 71-6, § 296-20-135, filed 6/1/71; Order 68-7, § 296-20-135, filed 11/27/68, effective 1/1/69.]

WAC 296-20-140 Conversion factor table—Anesthesia. This table is [a] conversion of fee schedule unit values to fees in dollar amounts at \$11.00 per unit. This conversion factor is to be applied to the anesthesia section of the fee schedule.

Unit Value	@\$11.00	Unit Value	@\$11.00	Unit Value	@\$11.00
.1	1.10	5.0	55.00	9.9	108.90
.2	2.20	5.1	56.10	10.0	110.00
.3	3.30	5.2	57.20	10.5	115.50
.4	4.40	5.3	58.30	11.0	121.00
.5	5.50	5.4	59.40	11.5	126.50
.6	6.60	5.5	60.50	12.0	132.00
.7	7.70	5.6	61.60	12.5	137.50
.8	8.80	5.7	62.70	13.0	143.00
.9	9.90	5.8	63.80	13.5	148.50
1.0	11.00	5.9	64.90	14.0	154.00
1.1	12.10	6.0	66.00	14.5	159.50
1.2	13.20	6.1	67.10	15.0	165.00
1.3	14.30	6.2	68.20	16.0	176.00

Unit Value	@\$11.00	Unit Value	@\$11.00	Unit Value	@\$11.00	Unit Value	@\$38.00	Unit Value	@\$38.00	Unit Value	@\$38.00
1.4	15.40	6.3	69.30	17.0	187.00	1.0	38.00	5.9	224.20	14.0	532.00
1.5	16.50	6.4	70.40	18.0	198.00	1.1	41.80	6.0	228.00	14.5	551.00
1.6	17.60	6.5	71.50	19.0	209.00	1.2	45.60	6.1	231.40	15.0	570.00
1.7	18.70	6.6	72.60	20.0	220.00	1.3	49.40	6.2	235.60	16.0	608.00
1.8	19.80	6.7	73.70	21.0	231.00	1.4	53.20	6.3	239.40	17.0	646.00
1.9	20.90	6.8	74.80	22.0	242.00	1.5	57.00	6.4	243.20	18.0	684.00
2.0	22.00	6.9	75.90	23.0	253.00	1.6	60.80	6.5	247.00	19.0	722.00
2.1	23.10	7.0	77.00	24.0	264.00	1.7	64.60	6.6	250.80	20.0	760.00
2.2	24.20	7.1	78.10	25.0	275.00	1.8	68.40	6.7	254.60	21.0	798.00
2.3	25.30	7.2	79.20	30.0	330.00	1.9	72.20	6.8	258.40	22.0	836.00
2.4	26.40	7.3	80.30	35.0	385.00	2.0	76.00	6.9	262.20	23.0	874.00
2.5	27.50	7.4	81.40	40.0	440.00	2.1	79.80	7.0	266.00	24.0	912.00
2.6	28.60	7.5	82.50	45.0	495.00	2.2	83.60	7.1	269.80	25.0	950.00
2.7	29.70	7.6	83.60	50.0	550.00	2.3	87.40	7.2	273.60	30.0	1,140.00
2.8	30.80	7.7	84.70	55.0	605.00	2.4	91.20	7.3	277.40	35.0	1,330.00
2.9	31.90	7.8	85.80	60.0	660.00	2.5	95.00	7.4	281.20	40.0	1,520.00
3.0	33.00	7.9	86.90	65.0	715.00	2.6	98.80	7.5	285.00	45.0	1,710.00
3.1	34.10	8.0	88.00	70.0	770.00	2.7	102.60	7.6	288.80	50.0	1,900.00
3.2	35.20	8.1	89.10	75.0	825.00	2.8	106.40	7.7	292.60	55.0	2,090.00
3.3	36.30	8.2	90.20	80.0	880.00	2.9	110.20	7.8	296.40	60.0	2,280.00
3.4	37.40	8.3	91.30	85.0	935.00	3.0	114.00	7.9	300.20	65.0	2,470.00
3.5	38.50	8.4	92.40	90.0	990.00	3.1	117.80	8.0	304.00	70.0	2,660.00
3.6	39.60	8.5	93.50	95.0	1,045.00	3.2	121.60	8.1	307.80	75.0	2,850.00
3.7	40.70	8.6	94.60	100.0	1,100.00	3.3	125.40	8.2	311.60	80.0	3,040.00
3.8	41.80	8.7	95.70	105.0	1,155.00	3.4	129.20	8.3	315.40	85.0	3,230.00
3.9	42.90	8.8	96.80	110.0	1,210.00	3.5	133.00	8.4	319.20	90.0	3,420.00
4.0	44.00	8.9	97.90	115.0	1,265.00	3.6	136.80	8.5	323.00	95.0	3,610.00
4.1	45.10	9.0	99.00	120.0	1,320.00	3.7	140.60	8.6	326.80	100.0	3,800.00
4.2	46.20	9.1	100.10	125.0	1,375.00	3.8	144.40	8.7	330.60	105.0	3,990.00
4.3	47.30	9.2	101.20	130.0	1,430.00	3.9	148.20	8.8	334.40	110.0	4,180.00
4.4	48.40	9.3	102.30	140.0	1,540.00	4.0	152.00	8.9	338.20	115.0	4,370.00
4.5	49.50	9.4	103.40	150.0	1,650.00	4.1	155.80	9.0	342.00	120.0	4,560.00
4.6	50.60	9.5	104.50	160.0	1,760.00	4.2	159.60	9.1	345.80	125.0	4,750.00
4.7	51.70	9.6	105.60	170.0	1,870.00	4.3	163.40	9.2	349.60	130.0	4,940.00
4.8	52.80	9.7	106.70	180.0	1,980.00	4.4	167.20	9.3	353.40	140.0	5,320.00
4.9	53.90	9.8	107.80	190.0*	[2,209.00]	4.5	171.00	9.4	357.20	150.0	5,700.00
				200.00	2,200.00	4.6	174.80	9.5	361.00	160.0	6,080.00
						4.7	178.60	9.6	364.80	170.0	6,460.00
						4.8	182.40	9.7	368.60	180.0	6,840.00
						4.9	186.20	9.8	372.40	190.0	7,220.00
										200.0	7,600.00

[Order 77-27, § 296-20-140, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-140, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-140, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-20-140, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-20-140, filed 1/30/74.]

*Reviser's note: The figure in brackets above was filed by the agency as 2,2090.00. This appears to be an error, as all other numbers in the column headed \$11.00 are exactly eleven times the amount in the column immediately to their left. Further, the agency order failed to show the change in this particular figure through the use of underlining as required by RCW 34.04.058, which deems ineffectual changes not filed by the agency in this manner.

WAC 296-20-145 Conversion factor table—Surgery. This table is a conversion of fee schedule unit values to fees in dollar amounts at \$38.00 per unit. This conversion factor applies only to the surgery section of the fee schedule.

Unit Value	@\$38.00	Unit Value	@\$38.00	Unit Value	@\$38.00
.1	3.80	5.0	190.00	9.9	376.20
.2	7.60	5.1	193.80	10.0	380.00
.3	11.40	5.2	197.60	10.5	399.00
.4	15.20	5.3	201.40	11.0	418.00
.5	19.00	5.4	205.20	11.5	437.00
.6	22.80	5.5	209.00	12.0	456.00
.7	26.60	5.6	212.80	12.5	475.00
.8	30.40	5.7	216.60	13.0	494.00
.9	34.20	5.8	220.40	13.5	513.00

[Order 77-27, § 296-20-145, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-145, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-145, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-145, filed 1/30/74.]

WAC 296-20-150 Conversion factor table—Radiology. This table is a conversion of the fee schedule unit values to fees in dollar amounts at \$3.90 per unit. This conversion factor is to be applied only to the radiology section of the fee schedule.

Unit Value	@\$3.90	Unit Value	@\$3.90	Unit Value	@\$3.90
.1	.39	5.0	19.50	9.9	38.61
.2	.78	5.1	19.89	10.0	39.00
.3	1.17	5.2	20.28	10.5	40.95
.4	1.56	5.3	20.67	11.0	42.90
.5	1.95	5.4	21.06	11.5	44.85
.6	2.34	5.5	21.45	12.0	46.80
.7	2.73	5.6	21.84	12.5	48.75
.8	3.12	5.7	22.23	13.0	50.70
.9	3.51	5.8	22.62	13.5	52.65
1.0	3.90	5.9	23.01	14.0	54.60
1.1	4.29	6.0	23.40	14.5	56.55
1.2	4.68	6.1	23.79	15.0	58.50
1.3	5.07	6.2	24.18	16.0	62.40
1.4	5.46	6.3	24.57	17.0	66.30

Medical Aid Rules

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Unit Value	@\$3.90	Unit Value	@\$3.90	Unit Value	@\$3.90	Unit Value	@\$.37	Unit Value	@\$.37	Unit Value	@\$.37
1.5	5.85	6.4	24.96	18.0	70.20	2.0	.74	6.9	2.55	23.0	8.51
1.6	6.24	6.5	25.35	19.0	74.10	2.1	.78	7.0	2.59	24.0	8.88
1.7	6.63	6.6	25.74	20.0	78.00	2.2	.81	7.1	2.63	25.0	9.25
1.8	7.02	6.7	26.13	21.0	81.90	2.3	.85	7.2	2.66	30.0	11.10
1.9	7.41	6.8	26.52	22.0	85.80	2.4	.89	7.3	2.70	35.0	12.95
2.0	7.80	6.9	26.91	23.0	89.70	2.5	.93	7.4	2.74	40.0	14.80
2.1	8.19	7.0	27.30	24.0	93.60	2.6	.96	7.5	2.78	45.0	16.65
2.2	8.58	7.1	27.69	25.0	97.50	2.7	1.00	7.6	2.81	50.0	18.50
2.3	8.97	7.2	28.08	30.0	117.00	2.8	1.04	7.7	2.85	55.0	20.35
2.4	9.36	7.3	28.47	35.0	136.50	2.9	1.07	7.8	2.89	60.0	22.20
2.5	9.75	7.4	28.86	40.0	156.00	3.0	1.11	7.9	2.92	65.0	24.05
2.6	10.14	7.5	29.25	45.0	175.50	3.1	1.15	8.0	2.96	70.0	25.90
2.7	10.53	7.6	29.64	50.0	195.00	3.2	1.18	8.1	3.00	75.0	27.75
2.8	10.92	7.7	30.03	55.0	214.50	3.3	1.22	8.2	3.03	80.0	29.60
2.9	11.31	7.8	30.42	60.0	234.00	3.4	1.26	8.3	3.07	85.0	31.45
3.0	11.70	7.9	30.81	65.0	253.50	3.5	1.30	8.4	3.11	90.0	33.30
3.1	12.09	8.0	31.20	70.0	273.00	3.6	1.33	8.5	3.15	95.0	35.15
3.2	12.48	8.1	31.59	75.0	292.50	3.7	1.37	8.6	3.18	100.0	37.00
3.3	12.87	8.2	31.98	80.0	312.00	3.8	1.41	8.7	3.22	105.0	38.85
3.4	13.26	8.3	32.37	85.0	331.50	3.9	1.44	8.8	3.26	110.0	40.70
3.5	13.65	8.4	32.76	90.0	351.00	4.0	1.48	8.9	3.29	115.0	42.55
3.6	14.04	8.5	33.15	95.0	370.50	4.1	1.52	9.0	3.33	120.0	44.40
3.7	14.43	8.6	33.54	100.0	390.00	4.2	1.55	9.1	3.37	125.0	46.25
3.8	14.82	8.7	33.93	105.0	409.50	4.3	1.59	9.2	3.40	130.0	48.10
3.9	15.21	8.8	34.32	110.0	429.00	4.4	1.63	9.3	3.44	140.0	51.80
4.0	15.60	8.9	34.71	115.0	448.50	4.5	1.67	9.4	3.48	150.0	55.50
4.1	15.99	9.0	35.10	120.0	468.00	4.6	1.70	9.5	3.52	160.0	59.20
4.2	16.38	9.1	35.49	125.0	487.50	4.7	1.74	9.6	3.55	170.0	62.90
4.3	16.77	9.2	35.88	130.0	507.00	4.8	1.78	9.7	3.59	180.0	66.60
4.4	17.16	9.3	36.27	140.0	546.00	4.9	1.81	9.8	3.63	190.0	70.30
4.5	17.55	9.4	36.66	150.0	585.00					200.0	74.00
4.6	17.94	9.5	37.05	160.0	624.00						
4.7	18.33	9.6	37.44	170.0	663.00						
4.8	18.72	9.7	37.83	180.0	702.00						
4.9	19.11	9.8	38.22	190.0	741.00						
				200.0	780.00						

[Order 77-27, § 296-20-150, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-150, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-20-150, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-20-150, filed 1/30/74.]

WAC 296-20-155 Conversion factor table—Pathology. This table is a conversion of the fee schedule unit values to fees in dollar amounts at \$0.37 per unit. This conversion factor is to be applied only to the pathology section of the fee section [schedule].

Unit Value	@\$.37	Unit Value	@\$.37	Unit Value	@\$.37
.1	.04	5.0	1.85	9.9	3.66
.2	.07	5.1	1.89	10.0	3.70
.3	.11	5.2	1.92	10.5	3.89
.4	.15	5.3	1.96	11.0	4.07
.5	.19	5.4	2.00	11.5	4.26
.6	.22	5.5	2.04	12.0	4.44
.7	.26	5.6	2.07	12.5	4.63
.8	.30	5.7	2.11	13.0	4.81
.9	.33	5.8	2.15	13.5	5.00
1.0	.37	5.9	2.18	14.0	5.18
1.1	.41	6.0	2.22	14.5	5.37
1.2	.44	6.1	2.26	15.0	5.55
1.3	.48	6.2	2.29	16.0	5.92
1.4	.52	6.3	2.33	17.0	6.29
1.5	.56	6.4	2.37	18.0	6.66
1.6	.59	6.5	2.41	19.0	7.03
1.7	.63	6.6	2.44	20.0	7.40
1.8	.67	6.7	2.48	21.0	7.77
1.9	.70	6.8	2.52	22.0	8.14

[Order 77-27, § 296-20-155, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-155, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-20-155, filed 1/30/74.]

WAC 296-20-170 Pharmacy—Acceptance of rules and fees. The acceptance and filling of a prescription for an injured worker entitled to benefits under the Industrial Insurance Law, constitutes acceptance of the department's Medical Aid Rules and shall comply with its rules and fees. [Order 76-34, § 296-20-170, filed 11/24/76, effective 1/1/77.]

WAC 296-20-17001 Allowance and payment for medication. The department will pay for medications dispensed for the treatment of conditions resulting from an industrial injury and/or conditions which are retarding the recovery from the industrial injury, for which the department has accepted responsibility. Bills for medication dispensed, following closure of a claim, on rejected claims or for conditions unrelated to the industrial injury will not be paid. [Order 76-34, § 296-20-17001, filed 11/24/76, effective 1/1/77.]

WAC 296-20-17002 Billing. The current national drug code number for each prescribed drug, followed by the wholesale cost to the pharmacy must be entered on each prescription. Bills for medication not containing this information on each prescription form will be returned to the pharmacy. Billing will be in accordance with the procedures outlined in WAC 296-20-125. [Order 76-34, § 296-20-17002, filed 11/24/76, effective 1/1/77.]

WAC 296-20-17003 Fees. Payment for drugs and medications will be made at the wholesale cost plus an additional fee, on the following basis:

Wholesale cost		Additional fee
up to \$1.99	+	\$3.25
\$2.00 to \$3.99	+	\$4.75
\$4.00 to \$7.99	+	\$5.75
\$8.00 to \$19.99	+	\$7.00
\$20.00 & over	+	\$7.00 + 10% wholesale cost

[Order 77-27, § 296-20-17003, filed 11/30/77, effective 1/1/78; Order 76-34, § 296-20-17003, filed 11/24/76, effective 1/1/77.]

WAC 296-20-200 General information. (1) The department of labor and industries has promulgated the following rules and categories to provide a comprehensive system of classifying unspecified permanent partial disabilities in the proportion they reasonably bear to total bodily impairment. The department's objectives are to reduce litigation and establish more certainty and uniformity in the rating of unspecified permanent partial disabilities pursuant to RCW 51.32.080(2).

(2) The following system of rules and categories directs the examining physician's attention to the actual conditions he finds and establishes a uniform system for conducting rating examinations and reporting his findings and conclusions in accord with broadly accepted medical principles.

The evaluation of bodily impairment must be made by medical experts. This system recognizes and provides for this. After conducting his examination, the examining physician will choose the appropriate category for each bodily area or system involved in the particular claim and include this information in his report. He will, therefore, in addition to describing the workmen's condition in his report, submit his conclusions as to the relative severity of the impairment by giving it in terms of a defined condition rather than a personal opinion as to a percentage figure. In the final section of this system of categories and rules are some rules for determining disabilities and the classification of disabilities in bodily impairment is listed for each category. These last provisions are for the department's administrative use in acting upon the medical opinions which have been submitted to it.

(3) In preparing this system, the department has complied with its duty to enact rules classifying unspecified disabilities in light of statutory references to nationally recognized standards or guides for determining various bodily impairments. Accordingly, the department has obtained and acted upon sound established medical opinion in thus classifying unspecified disabilities in the reasonable proportion they bear to total bodily impairment. In framing descriptive language of the categories and in assigning a percentage of disability, careful consideration has been given to nationally recognized medical standards and guides. Both are matters calling for the use of expert medical knowledge. For this reason,

the meaning given the words used in this set of categories and accompanying rules, unless the text or context clearly indicates the contrary, is the meaning attached to the words in normal medical usage.

(4) The categories describe levels of physical and mental impairment. Impairment is anatomic or functional abnormality or loss of function after maximum medical rehabilitation has been achieved. This is the meaning of "impairment" as the word is used in the guides mentioned above. This standard applies to all persons equally, regardless of factors other than loss of physical or mental function. Impairment is evaluated without reference to the nature of injury or the treatment therefore, but is based on the functional loss due to the injury or occupational disease. The categories have been framed to include conditions in other bodily areas which derive from the primary impairment. The categories also include the presence of pain, tenderness and other complaints. Workmen with comparable loss of function thus receive comparable awards.

(5) These rules and categories (WAC 296-20-200 through 296-20-690) shall only be applicable to compensable injuries occurring on or after the effective date of these rules and categories.

(6) These rules and categories (WAC 296-20-200 through 296-20-690) shall be applicable only to cases of permanent partial disability. They have no applicability to determinations of permanent total disability. [Order 74-32, § 296-20-200, filed 6/21/74, effective 10/1/74.]

WAC 296-20-210 General rules. (1) These general rules establish a uniform standard for conducting examinations and submitting reports of examinations. These general rules must be followed by physicians who make examinations or evaluations of permanent bodily impairment.

(a) Examinations for the medical determination of the extent of permanent bodily impairment shall be made only by physicians currently licensed to practice medicine and surgery.

(b) Whenever an examination is made, the physician shall record, among other pertinent information, the complete history as obtained from the person examined; the complete history of past injuries and diseases; the complaints; the age, sex, height and weight; x-ray findings and diagnostic tests made or reviewed in connection with the examination; the diagnosis; and all findings, including negative findings, in all bodily areas and systems where a detailed review of systems reveals past or present complaints. The physician shall record his conclusions as to: whether the residuals of the injury are fixed; whether treatment is required for the injury and, if so, any treatment shall be described. If the examining physician finds residuals of the injury are fixed, he shall record the appropriate category or categories of permanent impairment for diagnoses attributable to the industrial injury or occupational disease. Conditions or impairments not attributable to the industrial injury or occupational disease shall be described and diagnosed in the report, with a description of how they affect the person examined and the appropriate category of permanent impairment where possible.

(c) The examining physician shall not assign a percentage figure for permanent bodily impairment described in the categories established herein.

(d) Reports shall specify diagnoses and medical terms as listed in Current Procedural Terminology (CPT), Current Medical Information and Terminology (CMIT), International Classification of Diseases Adopted (ICDA), or Standard Nomenclature of Disease, except when otherwise specified in these rules. [Order 74-32, § 296-20-210, filed 6/21/74, effective 10/1/74.]

WAC 296-20-220 Special rules for evaluation of permanent bodily impairment. (1) Evaluations of permanent bodily impairment using categories require uniformity in procedure and terminology. The following rules have been enacted to produce this uniformity and shall apply to all evaluations of permanent impairment of an unspecified nature.

(a) Gradations of relative severity shall be expressed by the words "Minimal", "Mild", "Moderate" and "Marked" in an ascending scale. "Minimal" shall describe deviations from normal responses which are not medically significant. "Mild", "Moderate" and "Marked" shall describe ranges of medically significant deviations from normal responses. "Mild" shall describe the least severe third. "Moderate" shall describe the middle third. "Marked" shall describe the most severe third.

(b) "Permanent" describes those conditions which are fixed, lasting and stable, and from which within the limits of medical probability, further recovery is not expected.

(c) "Impairment" means a loss of physical or mental function.

(d) "Total bodily impairment", as used in these rules, is the loss of physical or mental function which is essentially complete short of death.

(e) The examining physician shall not assign a percentage figure for permanent bodily impairment described in the categories established herein.

(f) The method of evaluating impairment levels is by selection of the appropriate level of impairment. These descriptive levels are called "categories". Assessments of the level of impairment are to be made by comparing the condition of the injured workman with the conditions described in the categories and selecting the most appropriate category.

These rules and categories for various bodily areas and systems provide a comprehensive system for the measurement of disabling conditions which are not already provided for in the list of specified permanent partial disabilities in RCW 51.32.080(1). Disabilities resulting from loss of central visual acuity, loss of an eye by enucleation, loss of hearing, amputation or loss of function of the extremities will continue to be evaluated as elsewhere provided in RCW 51.32.080.

The categories have been classified in percentages in reasonable proportion to total bodily impairment for the purpose of determining the proper award. Provision has been made for correctly weighing the overall impairment due to particular injuries or occupational disease in cases in which there are preexisting impairments.

(g) The categories of the various bodily areas and systems are listed in the order of increasing impairment except as otherwise specified. Where several categories are given for the evaluation of the extent of permanent bodily impairment, the impairments in the higher numbered categories, unless otherwise specified, include the impairments in the lesser numbered categories. No category for a condition due to an injury shall be selected unless that condition is permanent as defined by these rules.

The examining physician shall select the one category which most accurately indicates the overall degree of permanent impairment unless otherwise instructed. Where there is language in more than one category which may appear applicable, the category which most accurately reflects the overall impairment shall be selected.

The categories include appropriate subjective complaints in an ascending scale in keeping with the severity of objective findings, thus a higher or lower category is not to be selected purely on the basis of unusually great or minor complaints.

(h) When the examination discloses a preexisting permanent bodily impairment in the area of the injury, the examining physician shall report the findings and any category of impairment appropriate to the workman's condition prior to his industrial injury in addition to the findings and the categories appropriate to the workman's condition after the injury.

(i) Objective physical or clinical findings are those findings on examination which are independent of voluntary action and can be seen, felt, or consistently measured by examining physicians.

(j) Subjective complaints or symptoms are those perceived only by the senses and feelings of the person being examined which cannot be independently proved or established.

(k) Muscle spasm as used in these rules is an involuntary contraction of a muscle or group of muscles of a more than momentary nature.

(l) An involuntary action is one performed independently of the will.

(m) These Special Rules for Evaluation of Permanent Bodily Impairment shall apply to all examinations for the evaluation of impairment, in accordance with RCW 51.32.080, for the body areas or systems covered by or enumerated in WAC 296-20-230 through 296-20-660.

(n) The rules for evaluation of each body area or system are an integral part of the categories for that body area or system.

(o) In cases of injury or occupational disease of bodily areas and/or systems which are not included in these categories or rules and which do not involve loss of hearing, loss of central visual acuity, loss of an eye by enucleation or loss of the extremities or use thereof, examining physicians shall determine the impairment of such bodily areas and/or systems in terms of percentage of total bodily impairment.

(p) The words used in the categories of impairments, in the rules for evaluation of specific impairments, the

general rules, and the special rules shall be deemed, unless the context indicates the contrary, to have their general and accepted medical meanings. [Order 74-32, § 296-20-220, filed 6/21/74, effective 10/1/74.]

WAC 296-20-230 Cervical and cervico-dorsal impairments. (1) Rules for evaluation of cervical and cervico-dorsal impairments are as follows:

(a) Muscle spasm or involuntary guarding, bony or fibrous fusion, any arthritic condition, internal fixation devices or other physical finding shall be considered, in selecting the appropriate category, only insofar as productive of cervical or cervico-dorsal impairment.

(b) Gradations of clinical findings of cervico-dorsal impairments in terms of "mild", "moderate" or "marked" shall be based on objective medical tests.

(c) Categories 2, 3, 4 and 5 include the presence of complaints of whatever degree in the neck or extremities.

(d) Bladder and/or bowel sphincter impairments deriving from cervical and cervico-dorsal impairment shall be evaluated separately.

(e) Neck as used in these rules and categories shall include the cervical and adjacent areas. [Order 74-32, § 296-20-230, filed 6/21/74, effective 10/1/74.]

WAC 296-20-240 Categories of permanent cervical and cervico-dorsal impairments. (1) No objective clinical findings are present. Subjective complaints may be present or absent.

(2) Mild cervico-dorsal impairment, with objective clinical findings of such impairment with neck rigidity substantiated by x-ray findings of loss of anterior curve, without significant objective neurological findings.

This and subsequent categories include the presence or absence of pain locally and/or radiating into an extremity or extremities. This and subsequent categories also include the presence or absence of reflex and/or sensory losses. This and subsequent categories also include objectively demonstrable herniation of a cervical intervertebral disc with or without discectomy and/or fusion, if present.

(3) Mild cervico-dorsal impairment, with objective clinical findings of such impairment, with neck rigidity substantiated by x-ray findings of loss of anterior curve, narrowed intervertebral disc spaces and/or osteoarthritic lipping of vertebral margins, with significant objective findings of mild nerve root involvement.

This and subsequent categories include the presence or absence of any other neurological deficits not otherwise specified in these categories with the exception of bladder and/or bowel sphincter impairments.

(4) Moderate cervico-dorsal impairment, with objective clinical findings of such impairment, with neck rigidity substantiated by x-ray findings of loss of anterior curve, narrowed intervertebral disc spaces and/or osteoarthritic lipping of vertebral margins, with objective findings of moderate nerve root involvement with weakness and numbness in one or both upper extremities.

(5) Marked cervico-dorsal impairment, with marked objective clinical findings of such impairment, with neck

rigidity substantiated by x-ray findings of loss of anterior curve, narrowed intervertebral disc spaces and/or osteoarthritic lipping of vertebral margins, with objective findings of marked nerve root involvement with weakness and numbness in one or both upper extremities. [Order 74-32, § 296-20-240, filed 6/21/74, effective 10/1/74.]

WAC 296-20-250 Impairments of the dorsal area.

(1) Rules for evaluation of permanent dorsal area impairments are as follows:

(a) Muscle spasm or involuntary guarding, bony or fibrous fusion, any arthritic condition, internal fixation devices or other physical finding shall be considered, in selection of the appropriate category, only insofar as productive of dorsal area impairment.

(b) Gradations of clinical findings of dorsal impairments in terms of "mild", "moderate" or "marked" shall be based on objective medical tests.

(c) Categories 2 and 3 include the presence of complaints of whatever degree.

(d) Bladder and/or bowel sphincter impairments deriving from impairments of the dorsal area shall be evaluated separately.

(e) Impairments which also involve the cervical or lumbar areas shall be evaluated only under the cervical and cervico-dorsal or dorsolumbar and lumbosacral categories. [Order 74-32, § 296-20-250, filed 6/21/74, effective 10/1/74.]

WAC 296-20-260 Categories of permanent dorsal area impairments. (1) No objective clinical findings are present. Subjective complaints may be present or absent.

(2) Mild or moderate dorsal impairment, with objective clinical findings of such impairment, without significant objective neurological findings, with or without x-ray changes of narrowed intervertebral disc spaces and/or osteoarthritic lipping of intervertebral margins. Includes the presence or absence of reflex and/or sensory losses.

This and the subsequent category include the presence or absence of pain, locally or radiating from the dorsal area.

(3) Marked dorsal impairment, with marked objective clinical findings, with marked x-ray findings of narrowed intervertebral disc spaces and/or osteoarthritic lipping of vertebral margins, with significant objective neurological deficits, complaints and/or findings, deriving from dorsal impairment. [Order 74-32, § 296-20-260, filed 6/21/74, effective 10/1/74.]

WAC 296-20-270 Dorso-lumbar and lumbosacral impairments. (1) Rules for evaluation of permanent dorso-lumbar and lumbosacral impairments are as follows:

(a) Muscle spasm or involuntary guarding, bony or fibrous fusion, any arthritic condition, internal fixation devices or other physical finding shall be considered, in selecting the appropriate category, only insofar as productive of low back impairment.

(b) Gradations of clinical findings of low back impairments in terms of "mild", "moderate" or "marked" shall be based on objective medical tests.

(c) All of the low back categories include the presence of complaints of whatever degree.

(d) Any and all neurological deficits, complaints, and/or findings in other bodily areas or systems which are the result of dorso-lumbar and lumbosacral impairments, except for objectively demonstrated bladder and/or bowel sphincter impairments, shall be evaluated by the descriptions contained in the categories of dorso-lumbar and lumbosacral impairments.

(e) Bladder and/or bowel sphincter impairments deriving from dorso-lumbar and lumbosacral impairments shall be evaluated separately.

(f) Low back as used in these rules and categories includes the lumbar and adjacent areas. [Order 74-32, § 296-20-270, filed 6/21/74, effective 10/1/74.]

WAC 296-20-280 Categories of permanent dorso-lumbar and lumbosacral impairments. (1) No objective clinical findings. Subjective complaints and/or sensory losses may be present or absent.

(2) Mild low back impairment, with mild intermittent objective clinical findings of such impairment but no significant x-ray findings and no significant objective motor loss. Subjective complaints and/or sensory losses may be present.

(3) Mild low back impairment, with mild continuous or moderate intermittent objective clinical findings of such impairment but without significant x-ray findings or significant objective motor loss.

This and subsequent categories include: the presence or absence of reflex and/or sensory losses; the presence or absence of pain locally and/or radiating into an extremity or extremities; the presence or absence of a laminectomy or discectomy with normally expected residuals.

(4) Mild low back impairment, with mild continuous or moderate intermittent objective clinical findings of such impairment, with mild but significant x-ray findings and with mild but significant motor loss objectively demonstrated by atrophy and weakness of a specific muscle or muscle group.

This and subsequent categories include the presence or absence of a surgical fusion with normally expected residuals.

(5) Moderate low back impairment, with moderate continuous or marked intermittent objective clinical findings of such impairment, with moderate x-ray findings and with mild but significant motor loss objectively demonstrated by atrophy and weakness of a specific muscle or muscle group.

(6) Marked low back impairment, with marked intermittent objective clinical findings or such impairment, with moderate or marked x-ray findings and with moderate motor loss objectively demonstrated by atrophy and weakness of a specific muscle or muscle group.

(7) Marked low back impairment, with marked continuous objective clinical findings of such impairment, with marked x-ray findings and with marked motor loss

objectively demonstrated by marked atrophy and weakness of a specific muscle or muscle group.

(8) Essentially total loss of low back functions, with marked x-ray findings and with marked motor loss objectively demonstrated by marked atrophy and weakness of a muscle group or groups. [Order 74-32, § 296-20-280, filed 6/21/74, effective 10/1/74.]

WAC 296-20-290 Impairments of the pelvis. (1) Rules for impairment of the pelvis:

(a) All of these categories include the presence of complaints of whatever degree.

(b) Categories 2, 5, 6 and 7 describe separate entities and more than one may be selected when appropriate. Category 9 includes the findings described in Category 3, and Category 8 includes the findings described in Category 4. [Order 74-32, § 296-20-290, filed 6/21/74, effective 10/1/74.]

WAC 296-20-300 Categories of permanent impairments of the pelvis. (1) Healed pelvic fractures without displacement, without residuals; healed fractures with displacement without residuals, of: single ramus, bilateral rami, ilium, innominate or coccyx; or healed fracture of single rami with displacement with deformity and residuals.

(2) Healed fractures with displacement with deformity and residuals of ilium.

(3) Healed fractures of symphysis pubis, without separation with displacement without residuals.

(4) Healed fractures of sacrum with displacement without residuals.

(5) Healed fracture of bilateral rami with displacement with deformity and residuals.

(6) Excision or nonunion of fractures of coccyx.

(7) Healed fractures of innominate, displaced one inch or more, with deformity and residuals.

(8) Healed fractures of sacrum extending into sacroiliac joint with deformity and residuals.

(9) Healed fractures of symphysis, displaced or separated, with deformity and residuals. [Order 74-32, § 296-20-300, filed 6/21/74, effective 10/1/74.]

WAC 296-20-310 Convulsive neurological impairments. (1) Rules for evaluation of convulsive neurological impairments:

(a) The description of categories 2, 3 and 4 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-310, filed 6/21/74, effective 10/1/74.]

WAC 296-20-320 Categories of permanent convulsive neurological impairments. (1) No electroencephalogram findings of convulsive neurological disorder. Subjective complaints may be present or absent.

(2) Electroencephalogram findings of convulsive neurological disorder, but on appropriate medication there are no seizures.

(3) Electroencephalogram findings of convulsive neurological disorder, and on appropriate medication there are each year either one through four major seizures or one through twelve minor seizures.

(4) Electroencephalogram findings of convulsive neurological disorder, and on appropriate medication there are each year either more than four major seizures or more than twelve minor seizures. [Order 74-32, § 296-20-320, filed 6/21/74, effective 10/1/74.]

WAC 296-20-330 Impairments of mental health.

(1) Rules for evaluation of permanent impairment of mental health:

(a) Mental illness means malfunction of the psychic apparatus that significantly interferes with ordinary living.

(b) Each person has a pattern of adjustment to life. The pattern of adjustment before the industrial injury or occupational disease serves as a base line for all assessments of whether there has been a permanent impairment due to the industrial injury or occupational disease.

(c) To determine the preinjury pattern of adjustment, all evaluations of mental health shall contain a complete preinjury history including, but not necessarily limited to: Family background and the relationships with parents or other nurturing figures; extent of education and reaction to it; military experience, if any; problems with civil authorities; any history of prolonged illness, and difficulty with recovery; any history of drug abuse or alcoholism; employment history, the extent of and reaction to responsibility, and relationships with others at work; capacity to make and retain friends; relationships with spouses and children; nature of daily activities, including recreation and hobbies; and lastly, some summary statement about the sources of the patient's self-esteem and sense of identity. Both strengths and vulnerabilities of the person shall be included.

(d) Differences in adjustment patterns before and after the industrial injury or occupational disease shall be described, and the report shall contain the examining physician's opinion as to whether any differences: (1) Are the result of the industrial injury or occupational disease and its sequelae, in the sense they would not have occurred had there not been the industrial injury or occupational disease; (2) are permanent or temporary; (3) are more than the normal, self-correcting and expectable response to the stress of the industrial injury or occupational disease; (4) constitute an impairment psychosocially or physiologically; and (5) are susceptible to treatment, and, if so, what kind. The presence of any unrelated or coincidental mental impairment shall always be mentioned.

(e) All reports of mental health evaluations shall use the diagnostic terminology listed in the Diagnostic and Statistical Manual of Mental Disorders of the American Psychiatric Association.

(f) No classification of impairment shall be made for complaints where the quality of daily life does not differ substantially from the preinjury pattern. A patient not currently employed may not engage in the same activities as when working, but the level and variety of his activities and zest for them shall distinguish the purely situational difference from cases of regression and withdrawal. In cases where some loss of use of body member is claimed, no category or impairment shall be assigned

unless there are objective findings of physiologic regression or consistent evidence of altered adaptability.

(g) The physician shall identify the schizoid, antisocial, inadequate, sociopathic, passive, hysterical, paranoid, or dependent personality types. Patients with these longstanding character disorders may show problem behavior that seems more related to current stress than it is, sometimes unconsciously insinuating themselves into difficult situations of which they then complain. Emotional reactions to an injury and subsequent events must be carefully evaluated in these patients. It must be medically probable that such reactions are permanent before a category of impairment can be attributed to the injury; temporary reactions or preexisting psychopathology must be differentiated. [Order 74-32, § 296-20-330, filed 6/21/74, effective 10/1/74.]

WAC 296-20-340 Categories for evaluation of permanent impairments of mental health. (1) Nervousness, irritability, worry or lack of motivation following an injury and commensurate with it and/or other situational responses to injury that do not alter significantly the life adjustment of the patient may be present.

(2) Any and all permanent worsenings of preexisting personality traits or character disorders where aggravation of preexisting personality trait or character disorder is the major diagnosis; mild loss of insight, mildly deficient judgment, or rare difficulty in controlling behavior, anxiety with feelings of tension that occasionally limit activity; lack of energy or mild apathy with malaise; brief phobic reactions under usually avoidable conditions; mildly unusual and overly rigid responses that cause mild disturbance in personal or social adjustment; rare and usually self-limiting psycho-physiological reactions; episodic hysterical or conversion reactions with occasional self-limiting losses of physical functions; a history of misinterpreted conversations or events, which is not a preoccupation; is aware of being absentminded, forgetful, thinking slowly occasionally or recognizes some unusual thoughts; mild behavior deviations not particularly disturbing to others; shows mild over-activity or depression; personal appearance is mildly unkempt. Despite such features, productive activity is possible most of the time. If organicity is present, some difficulty may exist with orientation; language skills, comprehension, memory; judgment; capacity to make decisions; insight; or unusual social behavior; but the patient is able to carry out usual work day activities unassisted.

(3) Episodic loss of self-control with risk of causing damage to the community or self; moments of morbid apprehension; periodic depression that disturbs sleep and eating habits or causes loss of interest in usual daily activities but self-care is not a problem; fear motivated behavior causing mild interference with daily life, frequent emotogenic organ dysfunctions requiring treatment; obsessive-compulsive reactions which limit usual activity; periodic losses of physical function from hysterical or conversion reactions; disturbed perception in that patient does not always distinguish daydreams from reality; recognizes his fantasies about power and money

are unusual and tends to keep them secret; thought disturbances cause patient to fear the presence of serious mental trouble; deviant social behavior can be controlled on request; exhibits periodic lack of appropriate emotional control; mild disturbance from organic brain disease such that a few work day activities require supervision.

(4) Very poor judgment, marked apprehension with startle reactions, foreboding leading to indecision, fear of being alone and/or insomnia; some psychomotor retardation or suicidal preoccupation; fear-motivated behavior causing moderate interference with daily life; frequently recurrent and disruptive organ dysfunction with pathology of organ or tissues; obsessive-compulsive reactions causing inability to work with others or adapt; episodic losses of physical function from hysterical or conversion reactions lasting longer than several weeks; misperceptions including sense of persecution or grandiosity which may cause domineering, irritable or suspicious behavior; thought disturbance causing memory loss that interferes with work or recreation; periods of confusion or vivid daydreams that cause withdrawal or reverie; deviations in social behavior which cause concern to others; lack of emotional control that is a nuisance to family and associates; moderate disturbance from organic brain disease such as to require a moderate amount of supervision and direction of work day activities.

(5) Marked apprehension so as to interfere with memory and concentration and/or to disturb markedly personal relationships; depression causing marked loss of interest in daily activities, loss of weight, unkempt appearance, marked psycho-motor retardation, suicidal preoccupation or attempts, or marked agitation as well as depression; marked phobic reactions with bizarre and disruptive behavior; psychophysiological reactions resulting in lasting organ or tissue damage; obsessive-compulsive reactions that preclude patient's usual activity; frequent or persistent loss of function from conversion or hysterical reactions with regressive tissue or organ change; defects in perception including frank illusions or hallucinations occupying much of the patient's time; behavior deviations so marked as to interfere seriously with the physical or mental well-being or activities of others; lack of emotional control including marked irritability or overactivity. [Order 74-32, § 296-20-340, filed 6/21/74, effective 10/1/74.]

WAC 296-20-350 Cardiac impairments. (1) Rule for evaluation of permanent cardiac impairments:

(a) Classification of impairment using the following categories shall be based upon a carefully obtained history, thorough physical examination and the use of appropriate laboratory aids. [Order 74-32, § 296-20-350, filed 6/21/74, effective 10/1/74.]

WAC 296-20-360 Categories of permanent cardiac impairments. (1) No objective findings are present. Subjective complaints may be present or absent.

(2) Objective findings of mild organic heart disease but no signs of congestive heart failure. No medically

appropriate symptoms produced by prolonged exertion or intensive effort or marked emotional stress.

(3) Objective findings of mild organic heart disease but no signs of congestive heart failure. Medically appropriate symptoms produced by prolonged exertion or intensive effort, or marked emotional stress but not by usual daily activities.

(4) Objective findings of moderate organic heart disease but no signs of congestive heart failure. Medically appropriate symptoms produced by prolonged exertion or intensive effort or marked emotional stress but not by usual daily activities.

(5) Objective findings of marked organic heart disease with minimal signs of congestive heart failure with therapy. Medically appropriate symptoms produced by usual daily activities.

(6) Objective findings of marked organic heart disease with mild to moderate signs of congestive heart failure despite therapy. Medically appropriate symptoms produced by usual daily activities. [Order 74-32, § 296-20-360, filed 6/21/74, effective 10/1/74.]

WAC 296-20-370 Respiratory impairments. (1) Rules for evaluation of permanent respiratory impairments:

(a) All reports of physical examination of persons for respiratory impairment shall include: date of examination, name, sex, address, birthdate, marital status, and occupation of the person being examined; height, weight, temperature, pulse rate, blood pressure and respiratory rate and physical findings on inspection, palpation, percussion, and auscultation, vital capacity tests including one-second forced expiratory volume, forced vital capacity and maximum voluntary ventilation; all symptoms such as wheeze, cough, orthopnea, chest pain, paroxysmal nocturnal dyspnea, expectoration, hemoptysis, as to date of onset, course with descriptions, variation, whether influenced by bodily activity, emotional stress, posture, allergens, immediate environmental factors, medications, frequency and duration, and how they are affected by respiratory infections; the history of the particular exposure, a history of any previous chest x-rays, any allergies, cardiac symptoms or diagnosis, chest surgery or deformities, trauma, or other conditions such as pneumothorax, pulmonary infarct or chemical bronchitis; all pertinent personal history of habits such as smoking, weight gain or loss, fatigability, appetite; use of medications such as steroids, digitalis, antibiotics, bronchodilators, expectorants, etc., and occupational history.

(b) Categories 2, 3 and 4 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-370, filed 6/21/74, effective 10/1/74.]

WAC 296-20-380 Categories of permanent respiratory impairments. (1) Tests of ventilatory functions are not less than 85 percent of predicted normal for the person's age, sex and height. Arterial oxygen saturation at rest and after exercise is normal. Chest x-rays show no significant abnormalities, although there may be evidence of mild healed or inactive disease. Subjective complaints may be present or absent.

(2) Tests of ventilatory function range from 70 to 85 percent of predicted normal for the person's age, sex and height. Arterial oxygen saturation at rest and after exercise is normal. Chest x-rays may be either normal or abnormal. Dyspnea consistent with ventilatory function, arterial oxygen saturation, and x-rays.

(3) Tests of ventilatory function range from 60 to 70 percent of predicted normal for the person's age, sex and height. Arterial oxygen saturation at rest is normal but after exercise is 88 to 93 percent. Dyspnea consistent with ventilatory function, arterial oxygen saturation and x-rays.

(4) Tests of ventilatory function range from 55 to 60 percent of predicted normal for the person's age, sex and height. Arterial oxygen saturation at rest and after exercise is 88 to 93 percent. Dyspnea consistent with ventilatory function, arterial oxygen saturation and x-rays.

(5) Tests of ventilatory function are less than 55 percent of predicted normal for the person's age, sex and height. Arterial oxygen saturation at rest and after exercise is less than 88 percent. Chest x-rays are abnormal. Dyspnea consistent with ventilatory function, arterial oxygen saturation and x-rays. [Order 74-32, § 296-20-380, filed 6/21/74, effective 10/1/74.]

WAC 296-20-390 Air passage impairments. (1) Rule for evaluation of permanent air passage impairments:

(a) Categories 2, 3, 4 and 5 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-390, filed 6/21/74, effective 10/1/74.]

WAC 296-20-400 Categories of permanent air passage impairments. (1) No objective findings are present. Subjective complaints may be present or absent.

(2) Objective findings of one or more of the following air passage defects: partial obstruction of oropharynx, laryngopharynx, larynx, trachea, bronchi, complete obstruction of nasopharynx or of nasal passages bilaterally. No dyspnea caused by the air passage defect even on activity requiring prolonged exertion or intensive effort.

(3) Objective findings of one or more of the following air passage defects: partial obstruction of oropharynx, laryngopharynx, larynx, trachea, bronchi, complete obstruction of nasopharynx or of nasal passages bilaterally, dyspnea caused by the air passage defect produced only by prolonged exertion or intensive effort.

(4) Objective findings of one or more of the following air passage defects: partial obstruction of oropharynx, laryngopharynx, larynx, trachea, bronchi, complete obstruction of nasopharynx or of nasal passages bilaterally, with permanent tracheostomy or stoma, dyspnea caused by the air passage defect produced only by prolonged exertion or intensive effort.

(5) Objective findings of one or more of the following air passage defects: partial obstruction of oropharynx, laryngopharynx, larynx, trachea, bronchi, with or without permanent tracheostomy or stoma if dyspnea is produced by moderate exertion.

(6) Objective findings of one or more of the following air passage defects: partial obstruction of oropharynx,

laryngopharynx, larynx, trachea, bronchi, with or without permanent tracheostomy or stoma if dyspnea is produced by moderate exertion. [Order 74-32, § 296-20-400, filed 6/21/74, effective 10/1/74.]

WAC 296-20-410 Nasal septum impairments. (1) Rules for evaluation of permanent air passage impairments due to nasal septum perforation.

(a) These categories, if appropriate, are to be used in addition to the Categories of Permanent Air Passage Impairment.

(b) Categories 1 and 2 include complaints of whatever degree. [Order 74-32, § 296-20-410, filed 6/21/74, effective 10/1/74.]

WAC 296-20-420 Categories of permanent air passage impairment due to nasal septum perforations. (1) Perforation or perforations posterior to the cartilaginous septum.

(2) Perforation or perforations through or anterior to the cartilaginous septum. [Order 74-32, § 296-20-420, filed 6/21/74, effective 10/1/74.]

WAC 296-20-430 Loss of taste and smell. (1) Rule for evaluation of permanent loss of taste and smell.

(a) If the person being examined can detect any odor or taste, even though it cannot be named, no category shall be assigned. [Order 74-32, § 296-20-430, filed 6/21/74, effective 10/1/74.]

WAC 296-20-440 Categories of permanent loss of taste and smell. (1) Loss of sense of taste.

(2) Loss of sense of smell. [Order 74-32, § 296-20-440, filed 6/21/74, effective 10/1/74.]

WAC 296-20-450 Speech impairments. (1) Rules for evaluation of permanent speech impairments.

(a) The physician making an examination for evaluation of permanent speech impairment should have normal hearing and the examination should be conducted in a reasonably quiet office which approximates the noise level conditions of everyday living.

(b) Selection of the appropriate category of permanent speech impairment shall be based on direct observation of the speech of the person being examined, including, but not limited to: Response to interview, oral reading, and counting aloud. The observation shall be made with the physician about eight feet from the person being examined both when he faces the physician and with his back to the physician. [Order 74-32, § 296-20-450, filed 6/21/74, effective 10/1/74.]

WAC 296-20-460 Categories of permanent speech impairments. (1) No objective findings of significant speech impairment are present. Subjective complaints may be present or absent.

(2) Can produce speech of sufficient audibility, intelligibility and functional efficiency for most everyday needs, although this may require effort and occasionally exceed capacity; listeners may occasionally ask for repetition and it may be difficult to produce some elements

of speech, and there may be slow speaking and hesitation.

(3) Can produce speech of sufficient audibility, intelligibility and functional efficiency for many everyday needs, is usually heard under average conditions but may have difficulty in automobiles, busses, trains, or enclosed areas; can give name, address, and be understood by a stranger, but may have numerous inaccuracies and have difficulty articulating; speech may be interrupted, hesitant or slow.

(4) Can produce speech of sufficient audibility, intelligibility and functional efficiency for some everyday needs such as close conversation, conversation with family and friends, but has considerable difficulty in noisy places; voice tires rapidly and tends to become inaudible in a few seconds, strangers may find patient difficult to understand; patient may be asked to repeat often, and often can only sustain consecutive speech for brief periods.

(5) Can produce speech of sufficient audibility, intelligibility and functional efficiency for few everyday needs; can barely be heard by a close listener or over the telephone; may be able to whisper audibly but has no voice; can produce some speech elements; may have approximation of a few words such as names of family members which are, however, unintelligible out of context; cannot maintain uninterrupted speech flow, speech is labored, and its rate is impractically slow.

(6) Is unable to produce speech of sufficient audibility, intelligibility and functional efficiency for any everyday needs. [Order 74-32, § 296-20-460, filed 6/21/74, effective 10/1/74.]

WAC 296-20-470 Skin impairments. (1) Rules for evaluation of permanent skin impairments.

(a) Evaluation of permanent impairment of the skin shall be based upon actual loss of function and cosmetic factors shall not be considered.

(b) Categories 2, 3, 4, 5 and 6 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-470, filed 6/21/74, effective 10/1/74.]

WAC 296-20-480 Categories of permanent skin impairments. (1) Objective findings of skin disorder may be present or absent but there is no or minimal limitation in daily activities. Subjective complaints may be present or absent.

(2) Objective findings of skin disorder are present and there is discomfort and minimal limitation in the performance of daily activities.

(3) Objective findings of skin disorder are present and there is limitation in some daily activities, including avoidance of and protective measures against certain chemical or physical agents. Intermittent symptomatic treatment is required.

(4) Objective findings of skin disorder are present and there is limitation in many daily activities, including avoidance of and protective measures against certain chemical or physical agents. Continuous symptomatic treatment is required.

(5) Objective findings of skin disorder are present and there is limitation in most daily activities, including

avoidance of and protective measures against certain chemical or physical agents. Continuous symptomatic treatment is required.

(6) Objective findings of skin disorder are present and there is limitation in all daily activities, including avoidance of and protective measures against certain chemical or physical agents. Continuous symptomatic treatment is required. [Order 74-32, § 296-20-480, filed 6/21/74, effective 10/1/74.]

WAC 296-20-490 Impairment of the upper digestive tract, stomach, esophagus or pancreas. (1) Rule for evaluation of permanent impairments of the upper digestive tract, stomach, esophagus or pancreas.

(a) Categories 2, 3, 4 and 5 include complaints of whatever degree. [Order 74-32, § 296-20-490, filed 6/21/74, effective 10/1/74.]

WAC 296-20-500 Categories of permanent impairments of the upper digestive tract, stomach, esophagus or pancreas. (1) No objective findings are present. Subjective complaints may be present or absent.

(2) There are objective findings of digestive tract impairment but no anatomic loss or alteration, continuous treatment is not required and weight can be maintained at the medically appropriate level.

(3) There are objective findings of digestive tract impairment, or there is anatomic loss or alteration. Dietary restrictions and drugs control symptoms, signs and/or nutritional state, and weight can be maintained at at least 90 percent of medically appropriate level.

(4) There are objective findings of digestive tract impairment, or there is anatomic loss or alteration. Dietary restrictions and drugs do not completely control symptoms, signs and/or nutritional state. Weight can be maintained at 80-90 percent of medically appropriate level.

(5) There are objective findings of digestive tract impairment, or there is anatomic loss or alteration. Dietary restrictions and drugs do not control symptoms, signs and/or nutritional state. Weight cannot be maintained as high as 80 percent of medically appropriate level. [Order 74-32, § 296-20-500, filed 6/21/74, effective 10/1/74.]

WAC 296-20-510 Lower digestive tract impairments. (1) Rule for evaluation of permanent lower digestive tract impairments.

(a) Categories 2, 3 and 4 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-510, filed 6/21/74, effective 10/1/74.]

WAC 296-20-520 Categories of permanent lower digestive tract impairments. (1) No objective findings of impairment of lower digestive tract. Subjective complaints may be present or absent.

(2) The objective findings of lower digestive tract impairment are infrequent and of brief duration, and there is limitation of activities, but special diet or medication is not required, and there are neither systemic manifestations nor impairment of nutrition.

(3) There are objective findings of lower digestive tract impairment or anatomic loss or alteration and mild gastrointestinal symptoms with occasional disturbance of bowel function, accompanied by moderate pain and minimal restriction of diet; mild symptomatic therapy may be necessary; no impairment of nutrition.

(4) There are moderate to marked intermittent bowel disturbances with continual or periodic pain; there is restriction of activities and diet during exacerbations, there are constitutional manifestations such as fever, anemia or weight loss. Includes but is not limited to any permanent ileostomy or colostomy. [Order 74-32, § 296-20-520, filed 6/21/74, effective 10/1/74.]

WAC 296-20-530 Impairment of anal function. (1) Rule for evaluation of permanent impairment of anal function.

(a) Categories 2, 3 and 4 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-530, filed 6/21/74, effective 10/1/74.]

WAC 296-20-540 Categories of permanent impairments of anal function. (1) No objective findings of impairment of anal function. Subjective complaints may be present or absent.

(2) There are objective findings of mild organic disease, anatomic loss or alteration with loss of anal function and mild incontinence involving gas and/or liquid stool.

(3) There are objective findings of moderate anal disease, anatomic loss or alteration with loss of anal function and moderate incontinence requiring continual care.

(4) There are objective findings of marked anal disease, anatomic loss, alteration and/or complete fecal incontinence. [Order 74-32, § 296-20-540, filed 6/21/74, effective 10/1/74.]

WAC 296-20-550 Liver and biliary tract impairments. (1) Rule for evaluation of permanent liver and biliary tract impairments.

(a) Categories 2, 3, 4 and 5 include complaints of whatever degree. [Order 74-32, § 296-20-550, filed 6/21/74, effective 10/1/74.]

WAC 296-20-560 Categories of permanent liver and biliary tract impairments. (1) There are no objective findings of impairment of the liver or biliary tract. Subjective complaints may be present or absent.

(2) There are objective findings on biochemical studies of minimal impairment of liver function with or without symptoms, or there are occasional episodes of loss of function of the biliary tract, but nutrition and strength are good.

(3) There are objective findings on biochemical studies of mild impairment of liver function without symptoms, or there is recurrent biliary tract impairment, but no ascites, jaundice or bleeding esophageal varices and nutrition and strength are good.

(4) There are objective findings on biochemical studies of moderate impairment of liver function with jaundice, ascites, bleeding esophageal varices or gastric varices and nutrition and strength may be affected; or

there is irreparable obstruction of the common bile duct with recurrent cholangitis.

(5) There are objective findings on biochemical studies of marked impairment of liver function and nutritional state is poor; or persistent jaundice, bleeding esophageal varices or gastric varices. [Order 74-32, § 296-20-560, filed 6/21/74, effective 10/1/74.]

WAC 296-20-570 Impairments of the spleen, loss of one kidney, and surgical removal of the bladder with urinary diversion. (1) Rule for evaluation of permanent impairments of the spleen, loss of one kidney, and surgical removal of bladder with urinary diversion.

(a) Categories 1, 2 and 3 include complaints of whatever degree. [Order 74-32, § 296-20-570, filed 6/21/74, effective 10/1/74.]

WAC 296-20-580 Categories of permanent impairment of the spleen, loss of one kidney, and surgical removal of bladder with urinary diversion. (1) Loss of spleen by splenectomy after age eight.

(2) Loss of one kidney by surgery or complete loss of function of one kidney.

(3) Surgical removal of bladder with urinary diversion. [Order 74-32, § 296-20-580, filed 6/21/74, effective 10/1/74.]

WAC 296-20-590 Impairment of upper urinary tract. (1) Rule for evaluation of permanent impairment of upper urinary tract.

(a) Categories 2, 3, 4 and 5 include the presence of complaints of whatever nature. [Order 74-32, § 296-20-590, filed 6/21/74, effective 10/1/74.]

WAC 296-20-600 Categories of permanent impairments of upper urinary tract. (1) No objective findings of impairment of upper urinary tract. Subjective complaints may be present or absent.

(2) Loss of upper urinary function as evidenced by creatinine clearance of 75 to 90 liters/24 hr. (52 to 62.5 ml/min) and PSP excretion of 15 percent to 20 percent in 15 minutes; or if there are intermittent objective findings of upper urinary tract disease or dysfunction not requiring continuous treatment or surveillance.

(3) Loss of upper urinary tract function as evidenced by creatinine clearance of 60 to 75 liters/24 hr. (42 to 52 ml/min) and PSP excretion of 10 percent to 15 percent in 15 minutes; or although function is greater than these levels, there are objective findings of upper urinary tract disease or dysfunction requiring continuous surveillance and frequent symptomatic treatment.

(4) Loss of upper urinary tract function as evidenced by creatinine clearance of 40 to 60 liters/24 hr. (28 to 42 ml/min) and PSP excretion of 5 percent to 10 percent in 15 minutes; or although function is greater than these levels, there are objective findings of mild or moderate upper urinary tract disease or dysfunction which can be only partially controlled.

(5) Loss of upper urinary tract function as evidenced by creatinine clearance below 40 liters/24 hr. (28 ml/min) and PSP excretion below 5 percent in 15 minutes; or although function is greater than these levels

there are objective findings of severe upper urinary tract disease or dysfunction which persists despite continuous treatment. [Order 74-32, § 296-20-600, filed 6/21/74, effective 10/1/74.]

WAC 296-20-610 Additional permanent impairments of upper urinary tract due to surgical diversion. (1) Rule for evaluation of additional permanent impairments of upper urinary tract due to surgical diversion.

(a) These categories include the presence of complaints of whatever degree. [Order 74-32, § 296-20-610, filed 6/21/74, effective 10/1/74.]

WAC 296-20-620 Categories of additional permanent impairments of upper urinary tract due to surgical diversion. (1) Uretero-intestinal diversion or cutaneous ureterostomy without intubation.

(2) Nephrostomy or intubated ureterostomy. [Order 74-32, § 296-20-620, filed 6/21/74, effective 10/1/74.]

WAC 296-20-630 Impairment of bladder function. (1) Rules for evaluation of permanent impairment of bladder function.

(a) In making examinations for evaluation of impairments of bladder function, physicians shall use objective techniques including, but not limited to, cystoscopy, cystography, voiding cystourethrography, cystometry, uroflowmetry, urinalysis and urine culture.

(b) Categories 2, 3, 4 and 5 include the presence of complaints of whatever degree. [Order 74-32, § 296-20-630, filed 6/21/74, effective 10/1/74.]

WAC 296-20-640 Categories of permanent impairments of bladder function. (1) No objective findings are present. Subjective complaints may be present or absent.

(2) Objective findings of bladder dysfunction, intermittent treatment required, but there is no dysfunction between such intermittent attacks.

(3) Objective findings of bladder dysfunction, continuous treatment required or there is good bladder reflex activity but no voluntary control.

(4) Objective findings of bladder dysfunction, there is poor reflex activity with intermittent dribbling and no voluntary control.

(5) Objective findings of bladder dysfunction, there is no reflex or voluntary control and there is continuous dribbling. [Order 74-32, § 296-20-640, filed 6/21/74, effective 10/1/74.]

WAC 296-20-650 Anatomical or functional loss of testes. (1) Rule for evaluation of permanent anatomical or functional loss of testes.

(a) Categories 2, 3, 4 and 5 include the presence of whatever complaints. [Order 74-32, § 296-20-650, filed 6/21/74, effective 10/1/74.]

WAC 296-20-660 Categories of permanent anatomical or functional loss of testes. (1) No objective findings. Subjective complaints may be present or absent.

(2) Anatomical or functional loss of one testicle.

(3) Anatomical or functional loss of both testes after the age of 65.

(4) Anatomical or functional loss of both testes between the ages of 40 and 65.

(5) Anatomical or functional loss of both testes before the age of 40. [Order 74-32, § 296-20-660, filed 6/21/74, effective 10/1/74.]

WAC 296-20-670 Disability. (1) The rules for determining disability are as follows:

(a) The determination of the percentage of disability in terms of total bodily impairment for any category is solely an administrative function and shall be done only in accordance with the tables of disability listed in WAC 296-20-680 and 296-20-690, or as otherwise provided in this chapter.

(b) When the industrial injury or occupational disease has caused further impairment to a bodily area where permanent bodily impairment existed prior to the industrial injury or occupational disease, the department shall award the percentage difference between the disability for the category of impairment which preexisted the industrial injury or occupational disease and the disability for the category of permanent impairment existing after the industrial injury or occupational disease.

(c) Neither the combined values chart provided in the Guides to the Evaluation of Permanent Impairment nor any other formula for the combination of the disabilities to different body areas or organ systems used in any other nationally recognized guide for determining bodily impairments shall be applied in computing the amount of disabilities to be awarded under these rules.

(d) Except as otherwise specifically provided, a percentage of total bodily impairment in one body area or system shall not be added to or combined with a percentage of total bodily impairment from another body area or system; the percentages for each body area or system shall be stated separately. [Order 74-32, § 296-20-670, filed 6/21/74, effective 10/1/74.]

WAC 296-20-680 Classification of disabilities in proportion to total bodily impairment.

(1) Permanent Cervical and Cervico-Dorsal Impairments

Category	1	0%
	2	10%
	3	20%
	4	25%
	5	35%

(2) Permanent Dorsal Region Impairments

Category	1	0%
	2	10%
	3	20%

(3) Permanent Dorso-Lumbar and Lumbosacral Impairments

Category	1	0%
	2	5%
	3	10%
	4	15%
	5	25%
	6	40%
	7	60%
	8	75%

(4) Permanent Impairments of the Pelvis

Category	1	0%
	2	2%
	3	5%
	4	5%
	5	5%
	6	5%
	7	10%
	8	10%
	9	15%

(5) Permanent Convulsive Neurologic Impairments

Category	1	0%
	2	10%
	3	35%
	4	60%

(6) Permanent Mental Health Impairments

Category	1	0%
	2	10%
	3	25%
	4	45%
	5	70%

(7) Permanent Cardiac Impairments

Category	1	0%
	2	10%
	3	20%
	4	35%
	5	50%
	6	65%

(8) Permanent Respiratory Impairments

Category	1	0%
	2	15%
	3	25%
	4	40%
	5	65%

(9) Permanent Air Passage Impairments

Category	1	0%
	2	5%
	3	15%
	4	25%
	5	35%
	6	60%

(10) Permanent Air Passage Impairments Due to Nasal Septum Perforations

Category	1	0%
	2	2%

(11) Permanent Loss of Taste and Smell

Category	1	3%
	2	3%

(12) Permanent Speech Impairments

Category	1	0%
	2	5%
	3	10%
	4	20%
	5	30%
	6	35%

(13) Permanent Skin Impairments

Category	1	0%
	2	5%
	3	10%
	4	25%
	5	40%
	6	60%

(14) Permanent Impairments of Upper Digestive Tract, Stomach, Esophagus or Pancreas

Category	1	0%
	2	5%
	3	10%
	4	35%
	5	60%

(15) Permanent Impairments of Lower Digestive Tract

Category	1	0%
	2	5%
	3	15%
	4	30%

(16) Permanent Impairments of Anal Function

Category	1	0%
	2	5%
	3	15%
	4	25%

(17) Permanent Impairments of Liver and Biliary Tract

Category	1	0%
	2	5%
	3	20%
	4	40%
	5	60%

- (18) Permanent Impairments of the Spleen, Loss of One Kidney, and Surgical Removal of Bladder with Urinary Diversion

Category	1	0%
	2	10%
	3	20%

- (19) Permanent Impairments of Upper Urinary Tract

Category	1	0%
	2	10%
	3	25%
	4	45%
	5	65%

- (20) Additional Permanent Impairments of Upper Urinary Tract Due to Surgical Diversion

Category	1	10%
	2	15%

- (21) Permanent Impairments of Bladder Function

Category	1	0%
	2	10%
	3	20%
	4	30%
	5	50%

- (22) Permanent Anatomical or Functional Loss of Testes

Category	1	0%
	2	5%
	3	10%
	4	25%
	5	35%

[Order 74-32, § 296-20-680, filed 6/21/74, effective 10/1/74.]

WAC 296-20-690 Permanent impairments of the cervico-dorsal (WAC 296-20-240) and lumbosacral regions (WAC 296-20-280) jointly.

- (1) Permanent Cervical and Cervicodorsal Impairment Category 1 Plus Permanent Dorsolumbar and Lumbosacral Impairment

Category	1	0%
	2	5%
	3	10%
	4	15%
	5	25%
	6	40%
	7	60%
	8	75%

- (2) Cervical-Cervicodorsal Category 2 Plus Dorsolumbar-Lumbosacral

Category	1	10%
	2	15%
	3	20%
	4	25%
	5	35%
	6	50%
	7	70%
	8	75%

- (3) Cervical-Cervicodorsal Category 3 Plus Dorsolumbar-Lumbosacral

Category	1	20%
	2	25%
	3	30%
	4	35%
	5	45%
	6	55%
	7	70%
	8	75%

- (4) Cervical-Cervicodorsal Category 4 Plus Dorsolumbar-Lumbosacral

Category	1	25%
	2	30%
	3	35%
	4	40%
	5	45%
	6	55%
	7	70%
	8	80%

- (5) Cervical-Cervicodorsal Category 5 Plus Dorsolumbar-Lumbosacral

Category	1	35%
	2	40%
	3	45%
	4	50%
	5	55%
	6	65%
	7	70%
	8	80%

[Order 74-32, § 296-20-690, filed 6/21/74, effective 10/1/74.]

**Chapter 296-21 WAC
MEDICAL FEES**

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SPECIFIC THERAPEUTIC PROCEDURES

- 296-21-085 Specific therapeutic procedures—Miscellaneous.
- 296-21-090 Special dermatological procedures.
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- 296-21-128 Special services and billing procedures—Anesthesia.
- 296-21-130 Calculation of total anesthesia values.

Reviser's note: Chapter 296-21 WAC previously codified WAC 296-21-010 through 296-21-470 "HOSPITAL, NURSE, LABORATORY MEDICAL AID RULES AND FEES" which were filed 9/17/64. Such rules were decodified as apparently superseded by similar rules filed 7/20/66 which were published in Supplement #2 (7/1/68) as an appendix to this chapter. The 1966 rules were expressly repealed by Order 68-7 codified herein as chapters 296-20, 296-21, 296-22 and 296-23 WAC.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-21-020 Home or nursing (convalescent) home visits. [Order 68-7, § 296-21-020, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.
- 296-21-055 Other services. [Order 70-12, § 296-21-055, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-055, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.
- 296-21-060 Specific diagnostic services. [Order 68-7, § 296-21-060, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.
- 296-21-065 Nonsurgical operating room services. [Order 68-7, § 296-21-065, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.

WAC 296-21-010 General information and instructions. (1) The following visits, examinations, consultations and similar services are the most frequently recurring and widely variable items of medical care. The time requirements of these services range from the briefest possible contact with the patient to the time-consuming interview and exhaustive examination needed to appraise a complete medical problem. The following graduation of services is listed in an attempt to reflect the relative values of the various times and skills required. The listed values apply only when these services are performed by or under the responsible supervision of a physician.

(2) When a cast is applied in the physician's office, the values for the cast materials only and for the use of the physician's cast room will be found in the Hospital section of the Fee Schedule.

(3) **SUPPLEMENTAL SKILLS:** When warranted by the necessity of supplemental skills, values for the services of two or more physicians will be allowed. [Order 74-7, § 296-21-010, filed 1/30/74; Order 70-12, § 296-21-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-010, filed 11/27/68, effective 1/1/69.]

WAC 296-21-011 Footnotes.

+ BR: By Report; see WAC 296-20-010, item 11 for detailed information.

@ Listed units represent basic anesthesia value only; add value for time. See WAC 296-21-130 for calculating total anesthesia values.

MEDICINE MODIFIERS

Listed values for most procedures may be modified under certain circumstances. When applicable, the modifying circumstance should be identified by the addition of the appropriate "modifier code number" (including the hyphen) after the usual procedure number. The value should be listed as a single modified total for the procedure. When multiple modifiers are applicable to a single procedure, see modifier code -99.

Unit Value

- 18 **EMERGENCY ROOM SERVICES:** When the physician is in the hospital, but is involved in patient care elsewhere and is called to the emergency room to provide emergency services, identify by adding this modifier (-18) to the usual emergency room procedure number and add. 4.0
- 20 **EMERGENCY ROOM SERVICES:** When the physician is called to the emergency room from outside the hospital to provide services, identify by adding this modifier (-20) to the usual emergency room service procedure number and add 14.0
- 22 **UNUSUAL SERVICES:** When the services provided are greater than those usually required for the listed procedure, identify by adding this modifier (-22) to the usual procedure number. List modified value. May require report. BR+
- 26 **PROFESSIONAL COMPONENT:** The listed values of certain procedures (laboratory, x-ray, specific diagnostic services, etc.) are a combination of a physician component and a technical component. When the physician component is billed separately, identify by adding this modifier (-26) to the usual procedure number.
- 52 **REDUCED VALUES:** Under certain circumstances, the listed value for a procedure is reduced or eliminated because of ground rules,

Unit Value

common practice, or at the physician's election (e.g., the management of a patient in diabetic coma involving detention with patient in critical condition, with spinal tap, gastric lavage, multiple arterial punctures, cutdown, etc.). Under these or similar circumstances, the services provided can be identified by their usual procedure numbers and the use of a reduced value indicated by adding this modifier (-52) to the procedure number. (Use of this modifier provides a means of reporting services at a reduced charge without disturbing usual relative values.)

-90 REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by other than the billing physician, the procedure(s) shall be identified by adding this modifier (-90) to the usual single or panel procedure number and shall be billed as charged to the physician.

-99 MULTIPLE MODIFIERS: Under certain circumstances multiple modifiers may be applicable. Under such circumstances, identify by adding this modifier (-99) to the usual procedure number and briefly indicate the circumstances. Value in accordance with appropriate modifiers BR+

[Order 74-7, § 296-21-011, filed 1/30/74.]

WAC 296-21-013 Special services and billing procedures. The following services are generally part of the basic services listed in the Maximum Fee Schedule but do involve additional expenses to the physician for materials, for his time or that of his employees. These services are generally provided as an adjunct to common medical services and should be used only when circumstances clearly warrant an additional charge over and above the usual charges for the basic services.

	Unit Value
99000 Collection and handling of specimen for transfer from the physician's office to a laboratory	6.0
99030 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
99038 Detention, prolonged, with patient requiring attention beyond usual	

	service (e.g., critically ill patient, 30 minutes or less)	25.0
99040	one hour	50.0
99052	Services requested between 6:00 P.M. and 8:00 A.M. in addition to basic services provided the office is closed during this period of time	12.0
99054	Services requested on Sundays and holidays in addition to basic services	12.0
99070	Supplies and materials provided by the physician over and above those usually included with the office visit or other services rendered (list drugs, trays, supplies or materials provided)	BR+
99082	Completion of Certificate of Disability Card	2.0
99085	Physician called on to convey instructions by telephone to hospital emergency room or nurse practitioner clinic—to be paid only to initial attending physician upon completion of Report of Accident form	12.0

DEFINITIONS

Definitions and Items of Commonality.
 Terms and phrases common to the practice of medicine are defined as follows and apply to procedures 90000 through 90696.

- (1) NEW PATIENT: A patient new to the physician.
- (2) ESTABLISHED PATIENT: A patient known to the physician and/or whose records are usually available.
- (3) CONSULTATION: A consultation includes services rendered by a physician whose opinion or advice is requested for the further evaluation and/or treatment of the patient. When the consulting physician assumes responsibility for the continuing care of the patient, any subsequent service rendered by him will cease to be a consultation. Four levels of consultation are recognized: limited, extensive, comprehensive and consultation of complexity.

For example:

- (a) In a LIMITED consultation the physician confines his service to the examination or evaluation of a single organ system for a limited condition. For example, the dermatologist's opinion about a skin lesion, the neurologist's opinion about a disc problem and the orthopedist's opinion about a knee or low back problem.
- (b) An EXTENSIVE consultation involves a prolonged evaluation including more than a single organ system or region. For example; The examination of the cardiac patient who needs clearance before undergoing a surgical operation, consultations involving cardio-pulmonary problems and neurologic and orthopedic examinations of patient whose complaints seem

disproportionate to his objective findings requiring detailed psychosocial evaluation.

(c) A **COMPREHENSIVE** consultation indicates the performance of detailed history (including the current problem, any previous illnesses, family disease tendencies and a review of all organ systems) and a thorough physical examination on a patient with a complex illness to establish the diagnosis and/or recommended therapy. For example; The young person with fever, arthritis and anemia and examination of patient for diagnosis and in depth evaluation of all organ systems for pre-existing and/or unrelated non-industrial conditions.

(d) The consultation of **UNUSUAL COMPLEXITY**: This is an uncommonly performed service with an in-depth medical opinion in a case involving all components of a detailed history with exhaustive examination of all organ systems and regions. For example; The patient with an undiagnosed fever of several years duration, with multiple hospitalizations, requiring a review of previous records, laboratory studies and radiographs as well as a comprehensive examination. Another example is the psychotic patient with minor cardiac findings who is being considered for cardio-pulmonary bypass because of complaints of angina. Another example is the paraplegic patient with iatrogenic drug addiction or dependency (condition resulting from treatment).

(4) **REFERRAL**: (Transfer) A referral is the transfer of the total or specific care of a patient from one physician to another and does not constitute a consultation. Initial evaluation and subsequent services are designated as listed below in levels of service.

(5) **INDEPENDENT PROCEDURE**: Certain listed procedures are commonly undertaken as an integral part of a total service. When such a procedure is undertaken as a separate entity, the designation "Independent Procedure" is appropriate. For example: A patient being seen in consultation by an ophthalmologist and it is necessary for him to perform a gonioscopy or a ophthalmoscopy with intravenous fluorescein as diagnostic procedures in connection with the consultation, then they would be considered as independent procedures. Another example would be cardiac monitoring with electronic equipment in intrathoracic or other critical surgery.

(6) **LEVELS OF SERVICE**: Examinations, evaluations, treatment, counseling, conferences with or concerning patients, and services which necessitate wide variations in skill, effort and time required for the diagnosis and treatment of illness and the promotion of optimal health. Six levels are recognized:

MINIMAL: A level of service including injections, dressings, minimal care, etc., not necessarily requiring the presence of the physician.

For Example:

- (a) Routine immunization for tetanus administered by a nurse.
- (b) Blood pressure determination by a nurse for medication control.
- (c) Removal of sutures from laceration.

BRIEF: A level of service requiring a brief period of time, with minimal effort by the physician.

For Example:

- (a) Certification of time loss in a stable or chronic case.
- (b) Re-examination of contusion or abrasion.
- (c) Examination of conjunctiva by the physician in a patient with subconjunctival hemorrhage, irrigation, medication and removal of foreign body with instrument.

LIMITED: A level of service requiring limited effort or judgment, such as abbreviated or interval history, limited examination or discussion of findings and/or treatment.

For Example:

- (a) Review and examination of uncomplicated sprains and strains with initiation, continuation and/or change of treatment.
- (b) Examination of an extremity fracture not requiring reduction.
- (c) Post-operative care in instances where the unit value is for surgical procedure only.

INTERMEDIATE: A level of service such as a complete history and physical examination of one or more organ systems, or an in depth counseling or discussion of the findings, but not requiring a comprehensive examination of the patient as a whole.

For Example:

- (a) Review of interval history; examination of neck veins, lungs, heart, abdomen and extremities, discussion of findings and prescription of treatment in decompensated arteriosclerotic heart disease.
- (b) Review of interval history, examination of musculoskeletal system, discussion of findings, and adjustment of therapeutic program in low back and/or arthritic disorders.
- (c) Review of recent illness: Examination of pharynx, neck, axilla, groin, and abdomen; interpretation of laboratory tests and prescription of treatment in infectious mononucleosis.
- (d) Evaluation of a chest, post trauma, with impaired respiration with development of shock.

EXTENDED: A level of service requiring an unusual amount of time, effort or judgment but not complete examination of the patient as a whole.

For Example:

- (a) Detailed review of results of diagnostic evaluation including discussion of physical findings, laboratory studies, x-ray examinations, diagnostic conclusions and recommendations for treatment.
- (b) Prolonged evaluation required for psychologically unstable or dependent patient.

COMPREHENSIVE: A level of service providing an in depth evaluation of the patient.

For Example:

- (a) Evaluation of the patient including complete history, physical examination and initiation of diagnostic and/or treatment program.

(b) Re-examination or re-evaluation of patient with continuing or new illness, including complete history, physical examination and initiation of diagnostic and/or treatment program.

(c) Evaluation of a head injury immediately post trauma with a known previous history of convulsive disorders and a post trauma history of transitory loss of consciousness, dizziness, visual problems, etc.

(d) Evaluation of a cardiac problem with respiratory distress resulting from inhalation of toxic and/or irritant chemicals. [Order 74-39, § 296-21-013, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-21-013, filed 1/30/74.]

WAC 296-21-014 Unlisted service or procedure. A service or procedure may be provided that is not listed in this fee schedule. When reporting such a service, the appropriate "Unlisted Procedure" code may be used to indicate the service, identifying it by "Special Report" as discussed in WAC 296-21-01401 below. The "Unlisted Procedures" and accompanying codes for MEDICINE are as follows:

- 90699 Unlisted medical service, general
- 90899 Unlisted psychiatric service or procedure
- 90939 Unlisted monitoring service
- 90999 Unlisted dialysis procedure
- 92499 Unlisted ophthalmological service
- 92599 Unlisted otorhinolaryngological service or procedure
- 93799 Unlisted cardiovascular service or procedure
- 94799 Unlisted pulmonary service or procedure
- 94899 Unlisted neurological service or procedure
- 95199 Unlisted allergy/clinical immunological service or procedure
- 95999 Unlisted miscellaneous diagnostic service or procedure
- 96499 Unlisted miscellaneous therapeutic service or procedure
- 96999 Unlisted special dermatological service or procedure
- 97799 Unlisted physical medicine service or procedure

[Order 76-34, § 296-21-014, filed 11/24/76, effective 1/1/77.]

WAC 296-21-01401 Special report. A service that is rarely provided, unusual, variable, or new may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent, and need for the procedure; and the time, effort, and equipment necessary to provide the service. Additional items which may be included are: Complexity of symptoms, final diagnosis, pertinent physical findings, diagnostic and therapeutic procedures, concurrent problems, and follow-up care. [Order 76-34, § 296-21-01401, filed 11/24/76, effective 1/1/77.]

WAC 296-21-015 Office visits.

Unit
Value

New Patient

- 90000 BRIEF evaluation, history, examination and/or treatment and submission of a report and/or if immediately following an injury submission of a Report of Accident 20.0
- 90001 Completion of Report of Accident only (for use in minor injuries not requiring the presence of the physician but rather cases in which he has been consulted and has issued treatment orders to staff, office or hospital). 12.0
- 90010 Initial LIMITED history and physical examination, including initiation of diagnostic and treatment program and submission of a report and/or if immediately following an injury, submission of a Report of Accident. (Routine visit involving a single region or organ system 30.0
- 90015 Initial INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and submission of a report and/or if immediately following an injury, submission of a Report of Accident. (Serious or complicated case involving one or more regions or organ systems. Complexity or complication must be indicated in report 50.0
- 90020 Initial COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program with submission of a report and/or if immediately following an injury, submission of a Report of Accident. (A complex case requiring an unusual amount of time, skill or judgment and an evaluation of the patient as a whole and accompanied with a detailed report in addition to the Report of Accident 70.0

Established Patient

- 90030 MINIMAL service (e.g., Injection, immunization, minimal dressing) (Independent procedure) 8.0
- 90040 BRIEF examination, evaluation and/or treatment. (Routine follow-up office visit 12.0
- 90050 LIMITED examination, evaluation and/or treatment. (Routine follow-up office visit). 16.0

	Unit Value
90060 INTERMEDIATE examination, evaluation and/or treatment. (Serious or complicated case involving one or more regions and/or organ systems, and accompanied with a detailed report)	20.0
90070 EXTENDED re-examination or re-evaluation requiring an unusual amount of time, skill or judgment, but not necessitating a complete examination or re-examination of the patient as a whole	30.0
90080 COMPREHENSIVE re-examination or re-evaluation requiring complete re-evaluation of the patient as a whole	50.0
90089 EXAMINATION FOR REOPENING and completion of a reopening application. A new patient or initial office visit fee will be paid for this reopening examination when justified by a report. Diagnostic studies and x-ray studies associated with the reopening examination will be allowed in addition to this fee	BR

[Order 76-34, § 296-21-015, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-015, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-015, filed 1/30/74; Order 71-6, § 296-21-015, filed 6/1/71; Order 68-7, § 296-21-015, filed 11/27/68, effective 1/1/69.]

WAC 296-21-025 Hospital visits.

New or Established Patients

	Unit Value
90200 Initial hospital care, BRIEF or LIMITED history and physical examination, including initiation of diagnostic and treatment program, preparation of hospital records and Report of Accident if being seen immediately following an industrial injury. (Routine visit involving a single region or organ system)	30.0
90215 Initial hospital care, INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program, preparation of hospital records and Report of Accident if being seen immediately following an industrial injury. (Serious or complicated case involving one or more regions and/or organ systems and indicated in a report)	50.0

	Unit Value
90220 Initial hospital care, COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program, preparation of hospital records and Report of Accident if being seen immediately following an industrial injury. (A complex case requiring an unusual amount of time, skill or judgment and evaluation of the patient as a whole accompanied by a detailed report in addition to the Report of Accident)	70.0
90240 BRIEF examination, evaluation and/or treatment, same illness. (Followup hospital care)	12.0
90250 LIMITED examination, evaluation and/or treatment. (Routine follow-up hospital care)	20.0
90260 INTERMEDIATE examination, evaluation and/or treatment. (Serious or complicated case involving one or more regions or organ systems)	30.0
90270 EXTENDED re-examination or re-evaluation, requiring an unusual amount of time, skill or judgment, but not necessitating a complete examination or re-evaluation of the patient as a whole	40.0

[Order 76-34, § 296-21-025, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-025, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-025, filed 1/30/74; Order 70-12, § 296-21-025, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-025, filed 11/27/68, effective 1/1/69.]

WAC 296-21-026 Extended care facility, convalescent hospital, and nursing home. Convalescent, Rehabilitation or Long-Term Care Services.

Convalescent, rehabilitative or long-term care involves active, definitive, professional care of a patient.

Unit
Value

New or Established Patient

90300 Initial care, BRIEF or LIMITED history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (Routine visit involving a single region or organ system)	30.0
90315 Initial care, INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (Serious or complicated	

	Unit Value
case involving one or more regions and/or organ systems).....	50.0
90320 Initial care, COMPREHENSIVE history and physical examination, including initiation of diagnostic and treatment program and preparation of records. (A complex case involving an unusual amount of time, skill or judgment and an evaluation of the patient as a whole accompanied by a detailed report).....	70.0
90340 BRIEF examination, evaluation and/or treatment, same illness.....	12.0
90350 LIMITED examination, evaluation and/or treatment. (Routine follow-up care).....	20.0
90360 INTERMEDIATE examination, evaluation and/or treatment. (Serious or complicated case involving one or more regions and/or organ systems).....	30.0
90370 EXTENDED examination, evaluation and/or treatment requiring an unusual amount of time, skill or judgment but not necessitating a complete evaluation of the patient as a whole.....	40.0

[Order 76-34, § 296-21-026, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-026, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-026, filed 1/30/74.]

WAC 296-21-027 Emergency room service. The following values apply for services performed in the Emergency Room when the physician is assigned to Emergency Room duty or is present in the Emergency Room because of other activity there, or if the physician elects to use the Emergency Room as a substitute for his office.

When the physician is in the hospital but is involved in patient care elsewhere and is called to the Emergency Room to provide emergency service, use modifier code -18, under WAC 296-21-011.

When the physician is called to the Emergency Room from outside the hospital to provide services, use modifier code -20, WAC 296-21-011.

Unit
Value

New Patient

90500 BRIEF evaluation, history, examination and/or treatment. (Not payable when other fees are payable except as indicated by modifiers).....	20.0
90510 Initial LIMITED history and physical examination, including initiation of diagnostic and treatment	

program. (Routine case involving a single region and/or organ system) (Not payable when other fees are payable except as indicated by modifiers).....	30.0
90515 Initial INTERMEDIATE history and physical examination, including initiation of diagnostic and treatment program. (Serious or complicated case involving one or more regions and/or organ systems) (Not payable when other fees are payable except as indicated by modifiers).....	50.0

Established Patient

90530 MINIMAL service (e.g., injection, minimal dressing, suture removal, minor laceration) (Not payable when other fees are applicable except as indicated by modifiers).....	8.0
90540 BRIEF examination, evaluation and/or treatment. (Not payable when other fees are applicable except as indicated by modifiers).....	12.0
90550 LIMITED examination, evaluation and/or treatment. (Routine follow up care) (Not payable when other fees are applicable except as indicated by modifiers).....	16.0
90560 INTERMEDIATE examination, evaluation and/or treatment. (Case involving one or more regions and/or organ systems) (Not payable when other fees are payable except as indicated by modifiers).....	20.0
90570 EXTENDED re-examination or re-evaluation and/or treatment requiring an unusual amount of time, skill or judgment but not necessitating evaluation of the man as a whole. (Not payable when other fees are applicable except as indicated by modifiers).....	30.0

[Order 76-34, § 296-21-027, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-027, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-21-027, filed 1/30/74.]

WAC 296-21-030 Consultations. A CONSULTATION is considered here to include those services rendered by a physician whose OPINION OR ADVICE is requested by another physician or agency in the evaluation and/or treatment of a patient's illness. When the consultant physician thereupon assumes the CONTINUING CARE of the patient, any subsequent service(s) rendered by him will no longer be considered as a consultation.

A REFERRAL is considered here to be the transfer of the total or specific care of a patient from one physician to another. THIS IS NOT A CONSULTATION. Values for the initial visit and the subsequent services for referrals are listed under the appropriate headings in other portions of this schedule.

The values do not necessarily include consultations involving litigation.

(For special narrative reports or review of records, see 99080)

	Unit Value
90600 Consultation requiring LIMITED examination and/or evaluation of a given system or region but not requiring a comprehensive history and examination with report.....	30.0
90610 Consultation requiring more extensive examination and/or evaluation of one or more regions or organ systems but not requiring comprehensive history and examination with report	50.0
90620 Consultation requiring COMPREHENSIVE history, examination and/or evaluation of one or more regions and/or organ systems with report.....	70.0
90630 Consultation of unusual complexity (in excess of scope of services identified by 90600, 90610 and 90620.) Necessitating exceptionally detailed history and examination with extensive review of prior medical records, completion and assessment of data and the preparation of a special report.....	BR+

[Order 74-7, § 296-21-030, filed 1/30/74; Order 70-12, § 296-21-030, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-030, filed 11/27/68, effective 1/1/69.]

WAC 296-21-035 Special and commission examinations. Purpose:

Special examinations or commissions may be requested by the Department or the attending physician; this is usually for one of the following purposes:

- (1) To establish a diagnosis. Prior diagnoses may be controversial or ill-defined.
- (2) To outline a basis of rational treatment, where treatment or progress is controversial.
- (3) To establish medical data to determine if the medical condition is industrially acquired, or unrelated to industrial work activities.
- (4) To determine the extent and duration of aggravation of pre-existing medical condition, by an industrial injury or exposure.
- (5) To establish when the accepted medical condition has reached maximum benefit from treatment.

(6) To establish a percentage rating of any permanent disability, based on the loss of body function when maximum recovery is reached.

(7) To determine the indications for reopening of a claim for further treatment on basis of aggravation of accepted condition, based on objective findings.

Special examination must be specific and factual if accurate and consistent judgment is to be maintained and the result give justice and uniformity.

The history should be checked for accuracy, variation or exaggeration. Physical findings should be detailed enough to be compatible with the history, diagnosis and conclusions.

Diagnoses: Must be specific and describe the pathology found and be substantiated by the history and physical findings. (Vague terminology only confuses.)

Conclusions: Must be specific and definitely express an opinion on the purpose for which the examination was requested. This should be rationalized with the history, physical findings and diagnosis. (Evasiveness, generalizations and omissions frequently render the report misleading or worthless for the intended purpose.)

Permanent Disability: Ratings must be substantiated by sufficient objective findings and medical data to establish the percentage disability rating; also medical logic to demonstrate a definite causal relationship to the accepted industrial conditions on a more probable than not basis.

[Order 74-7, § 296-21-035, filed 1/30/74; Order 68-7, § 296-21-035, filed 11/27/68, effective 1/1/69.]

WAC 296-21-040 Special and closing examinations.

	Unit Value
90640 Special or closing examination, (including examination by the attending physician) requiring the examination and/or evaluation involving loss of function and permanent impairment of a minor nature to a region and/or organ system and requiring a limited history and physical examination	50.0
90650 Special or closing examination, (including examination by the attending physician) requiring more extensive examination and/or evaluation involving loss of function and permanent impairment to one or more regions and/or organ system but not requiring a comprehensive history and physical examination	100.0

[Order 75-39, § 296-21-040, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-21-040, filed 1/30/74; Order 68-7, § 296-21-040, filed 11/27/68, effective 1/1/69.]

WAC 296-21-045 Commission examination.

(For skin testing, see 86450-86585)

	Unit Value
90660 Special or commission examination requiring examination and/or evaluation involving considerable loss of function and permanent impairment requiring an extremely comprehensive history and physical examination	150.0
90670 Special or commission examination of unusual complexity in excess of scope of examinations identified by 90640, 90650 and 90660, involving extensive loss of function and permanent impairment necessitating complete history and examination and extensive review of prior medical records compilation and assessment of data, and the preparation of an exceptionally detailed report	BR
90680 In complicated or controversial cases where voluminous Departmental files must be reviewed in connection with a special or commission examination within the scope of examinations identified by 90640, 90650 and 90660, an additional fee will be allowed at the discretion of the Department	40.0
90690 When a consolidated commission examination report is submitted, an additional fee will be allowed to the examiner who prepares and transmits the report to the Department	14.0
90695 Time loss by physician from failure of the worker to appear for a special or commission examination and the physician is unable to see other patients during the time set aside for the special or commission examination, each 1/2 hour not to exceed two hours	25.0
90696 Conference with Department field representative relative to an individual case. (Each 15 minutes)	16.0

[Order 76-34, § 296-21-045, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-21-045, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-21-045, filed 1/30/74; Order 71-6, § 296-21-045, filed 6/1/71; Order 68-7, § 296-21-045, filed 11/27/68, effective 1/1/69.]

WAC 296-21-047 Therapeutic injections.

(For cost of drugs supplied by physician, see 99070)

(For injections performed as an independent procedure, see 90030)

(For allergy testing, see WAC 296-21-075)

90750 Therapeutic injections performed in conjunction with other services may warrant an additional charge	6.0
90755 First and last office visit for parenteral medication when given in a series to include the treatment of the day	11.0

[Order 74-7, § 296-21-047, filed 1/30/74.]

WAC 296-21-050 Psychiatric services.

	Unit Value	Basic Anes@
90800 Psychotherapy, office, hospital, verbal, drug augmented or other methods, 50 minutes	50.0	
90801 25 minutes	30.0	
90802 15 minutes	20.0	
90810 group (maximum 8 persons per group) one and one-half hours, per person, per session	20.0	
90820 Convulsive therapy, electroconvulsive or drug induced, inpatient or outpatient, with or without anesthesia by treating physician	50.0	3.0
90830 Insulin shock therapy, hypoglycemic, subcoma, per treatment	40.0	
90840 Psychologic testing, psychometric and/or projective tests, with written report, given by or under supervision of physician, per hour	45.0	
90850 Inpatient care including psychotherapy and supervision of milieu team (e.g., occupational therapy, psychiatric nursing, etc.) or conference with family, 50 minutes	50.0	
90851 25 minutes	30.0	
90852 15 minutes	20.0	

(For psychiatric consultation see 90600-90630)

90853 If a claimant fails to appear for the initial psychiatric treatment interview and the psychiatrist, through investigation, including contact with the patient, files a useful report including recommendations, he is entitled to a full hour's fee	50.0
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[Order 74-7, § 296-21-050, filed 1/30/74; Order 68-7, § 296-21-050, filed 11/27/68, effective 1/1/69.]

WAC 296-21-057 Monitoring services. The following values are for physician's services only and do not include charges for use of equipment or supplies.

	Unit Value	
90900		Assembly and operation of pump with oxygenator or heat exchanger (with or without ECG and/or pressure monitoring), per hour 60.0
90920		Monitoring ECG, pressures, etc., in intrathoracic or other critical surgery, per hour (independent procedure) 55.0
90930	BR+	Monitoring EEG at surgery (independent procedure)
Dialysis		
90940	BR+	Hemodialysis, acute renal failure or intoxication, per dialysis
90945	BR+	chronic irreversible renal insufficiency, initial stabilizing therapy, up to 4 weeks
90946	BR+	per dialysis
90947	BR+	maintenance, hospital, per month
90950	BR+	per dialysis
(For cannula insertion, see 36800-36820)		
90960	BR+	Peritoneal dialysis, including cannula insertion, per dialysis
90961	BR+	excluding cannula insertion, per dialysis
(For cannula insertion by other than treating physician, see 49420)		

SPECIFIC DIAGNOSTIC SERVICES

Listed values may be added to other significant services, except when commonly performed as an integral part of a history and physical examination. [Order 74-7, § 296-21-057, filed 1/30/74.]

WAC 296-21-062 Eye.

	Unit Value	Basic Anes@
92000		
92001		
92005		
92006		
92020		3.0

[Title 296 WAC—p 140]

	Unit Value	Basic Anes@
92040		
92045		
92060		
92065		
92080		
92100		
92120		
92140		
92200		
92210		3.0
92220		
92230		
92235		
92250		
92260		
92300		
[Order 74-7, § 296-21-062, filed 1/30/74. Formerly WAC 296-22-400 (part).]		

WAC 296-21-064 Ear.

	Unit Value
92500	
92505	
92510	
92515	

	Unit Value
92530 Vestibular function test	30.0
92535 Electronystagmography	BR+
92550 Audiologic evaluation for site of lesion Any or all of the following tests may be included: pure tone air and bone audiometry, speech au- diometry, Bekesy audiometry, tone decay test, SISI test (two or more frequencies), equal loudness balance tests (or alternate bi- naural balance tests)	BR+
92570 Special audiologic evaluation for functional (non-organic) hearing loss Any or all of the following tests may be necessary: pure tone air and bone audiometry, speech au- diometry, psychogalvanic skin re- flex tests, Bekesy audiometry, Stenger test, Doerfler-Stewart test, Lombard test, delayed feed- back test. Repeat tests for any or all of the above procedures may be necessary	BR+

[Order 74-7, § 296-21-064, filed 1/30/74.]

WAC 296-21-066 Cardiovascular. Values for items 93000-93781 include laboratory procedure(s), interpretation and physician's services (except surgical and anesthesia services as listed in the section on Surgery), unless otherwise stated.

	Unit Value	Basic Anes@
93000 Electrocardiogram, with inter- pretation and report	30.0	
93005 tracing only, without inter- pretation and report	20.0	
93010 interpretation and report only	15.0	
(For ECG monitoring at surgery, see 90920)		
93020 with exercise test	50.0	
93025 tracing only without in- terpretation and report	30.0	
93030 interpretation and report only	25.0	
93040 single lead (for rhythm) with interpretation	10.0	
93045 esophageal lead	50.0	
93050 Transportation of ECG equip- ment to home within radius of 7 miles	10.0	
(For additional mileage, see 99030)		
93200 Phonocardiogram with inter- pretation and report	50.0	

93205 with indirect carotid artery tracing or similar study	60.0
93220 Vectorcardiogram (VCG), with or without ECG, inter- pretation and report	50.0
93240 Ballistocardiogram	BR+
93260 Cardiovascular stress testing	BR+

(For exercising ECG, see 93020-93030)

Cardiac Catheterization

Listed values are for the physician's services only and include usual preassessment of cardiac problem and recording of intra-cardiac pressure. (For consultation services, see 90600-90630)

93500 Cardiac catheterization, in- cluding placement of catheter(s), recording of intra- cardiac and intravascular pres- sures, obtaining blood samples for measurement of blood gas- es and/or dye (or other) dilu- tion curves and cardiac output measurements [dye dilution (Fick) or other method with or without rest and exercise or other studies], with or without chamber injection for angio- cardiography, final evaluation and report, right heart only	350.0	5.0
93510 left, percutaneous	200.0	5.0
93515 trans-septal	200.0	5.0
93520 retrograde	200.0	5.0
93525 combined left and right	450.0	5.0
93540 Injection procedure for selec- tive coronary arteriography in conjunction with 93510, 93520 or 93525	150.0	7.0

(For injection procedure for selective coronary arteriography performed independently, see 36230)

(For radiographic procedures, see 75500-75890)

93550 Independent evaluation of car- diac catheterization data and report	50.0
93560 Dye dilution studies, indicator dye curves, including arterial cannulization (independent procedure)	30.0
93565 with cardiac output mea- surement, initial (independ- ent procedure)	50.0
93566 subsequent, same study period, each	20.0

(For radio-isotope methods, see 78190)

	Unit Value	Basic Anes@
Other Vascular Studies		
(For arterial cannulization and recording of direct arterial pressure, see 36620)		
(For radiographic injection procedures, see 36000-36250)		
(For vascular cannulization for hemodialysis, see 36800-36820)		
(For chemotherapy for malignant disease, see 96030-96050)		
93700 Peripheral vascular disease studies.....	BR+	
93720 Plethysmography, total body....	BR+	
93725 regional.....	BR+	
93740 Temperature gradient studies ...	BR+	
93760 Thermogram.....	BR+	
93770 Venous pressure determination.....	10.0	
(For central venous cannulization and pressure measurements, see 36480-36500)		
93780 Circulation time, one test.....	10.0	
93781 two or more test materials....	20.0	
[Order 74-7, § 296-21-066, filed 1/30/74. Formerly WAC 296-21-060 (part).]		

WAC 296-21-070 Pulmonary. Values for items 94010-94770 include laboratory procedure(s), interpretation and physician's services (except surgical and anesthesia services as listed in the section on Surgery), unless otherwise stated.

	Unit Value
94010 Spirometry, complete, including graphic record, total and timed vital capacity and maximal breathing capacity, with written report.....	30.0
94030 Bronchspirometry: measurement of differential ventilation and oxygen consumption (independent procedure).....	50.0
(For insertion of tube, see 31700)	
94060 Bronchospasm evaluation: spirometry as in 94010, before and after bronchodilator (aerosol or parenteral).....	50.0
94150 Vital capacity, total.....	6.0
94160 total and timed (forced expiratory volumes).....	10.0
94200 Maximal breathing capacity (maximum voluntary ventilation).....	20.0
94210 Maximal expiratory flow rate measurement or equivalent (independent procedure).....	10.0

	Unit Value
94240 Residual air (helium method) including equilibration time.....	25.0
94280 Residual air (open circuit method) including alveolar nitrogen.....	60.0
94350 Nitrogen washout curve (continuous).....	BR+
(For plethysmography, see 93720, 93725)	
94680 Oxygen uptake, expired gas analysis, rest and exercise, direct, simple.....	50.0
94681 including CO ₂ output, percentage oxygen extracted.....	100.0
94690 rest, indirect (independent procedure).....	16.0
94700 Arterial blood gas study (including cannulization of artery, measurement of arterial oxygen saturation, PO ₂ , PCO ₂ , CO ₂ content and pH), rest only.....	70.0
94705 rest and exercise.....	130.0
94710 complete, 4 or more (e.g., O ₂ administration, IPPB, exercise, etc.).....	220.0

(For values for blood gas determination, see 82800 et seq.)

(For single arterial puncture, see 36600)

94720 Carbon monoxide diffusing capacity.....	BR+
94750 Pulmonary compliance.....	BR+
94770 Carbon dioxide, expired gas determination by infrared analyzer.....	BR+

[Order 74-7, § 296-21-070, filed 1/30/74; Order 68-7, § 296-21-070, filed 11/27/68, effective 1/1/69.]

WAC 296-21-075 Allergy testing.

(For skin testing of bacterial, viral, fungal extracts, etc., see 86450-86585)

The following values are based on allergy testing performed under the direct supervision of a physician, and must include physician observation and interpretation of their significance in relation to the history and physical examination. Listed values may be added to other significant services rendered at the same visit.

	Unit Value
95000 Scratch or puncture test, one to ten tests.....	10.0
95001 each additional test.....	1.0
95020 Intradermal test, one to ten tests.....	15.0
95021 each additional test.....	1.5
95040 Patch test, one to five tests.....	10.0
95041 each additional test.....	2.0
95050 Photo-patch test, one to three tests.....	10.0
95051 each additional test.....	4.0
95056 Photo test, one to five tests.....	10.0

	Unit Value
95057 each additional test	2.0
95060 Mucous membrane test (ophthal- mic, sublingual and/or nasal), one or two tests.	10.0
95061 each additional test	4.0
95070 Direct bronchial mucosa (insuffla- tion) testing	BR+
95080 Passive transfer test (including cost of recipient), one to ten tests	100.0
95081 each additional test	2.0
95090 Allergic conditions necessitating ex- tensive testing	BR+

(For thermogram, see 93760)

(For preparation of antigens, materials supplied by
physician, etc., see 99070)

[Order 74-7, § 296-21-075, filed 1/30/74; Order 68-7,
§ 296-21-075, filed 11/27/68, effective 1/1/69.]

WAC 296-21-080 Miscellaneous.

(For skin testing of bacterial, viral, fungal extracts,
etc., see 86450-86585)

	Unit Value
95810 Exclusion tests for pheochromocy- toma (e.g., regitine, benzodioxane, histamine, etc.)	30.0
95820 Electroencephalogram (EEG), awake, asleep (natural or induced) and activation	70.0
(For EEG monitoring during surgery, see 90930)	
95830 Muscle testing, manual, per ex- tremity or trunk, with report	16.0
95835 total evaluation of body	64.0
95840 electrodiagnosis (e.g., reaction of degeneration, chronaximetry, strength duration curve or cathode/tetanus ratio), one ex- tremity, any one method.	24.0
95841 each additional method	24.0
95850 Range of motion measurements and report, each extremity (independent procedure).	16.0
95860 Electromyography, one extremity and related paraspinal area	80.0
95861 two extremities and related para- spinal areas	120.0
95862 four extremities and related paraspinal areas	200.0
95900 Nerve conduction velocity study, motor or sensory, each nerve	32.0
95905 contralateral nerve	24.0
95910 motor and sensory, each nerve	56.0
95915 contralateral nerve	48.0
95920 additional ipsilateral or contra- lateral nerve, each	32.0

95930 Achilles reflex response, electrical recording (ART)	10.0
95950 Ultrasonography (echograms) "A" scan, brain	BR+
95960 other areas or organs	BR+
95980 "B" scan	BR+

[Order 74-7, § 296-21-080, filed 1/30/74; Order 68-7,
§ 296-21-080, filed 11/27/68, effective 1/1/69.]

SPECIFIC THERAPEUTIC PROCEDURES

**WAC 296-21-085 Specific therapeutic proce-
dures—Miscellaneous.**

	Unit Value	Basic Anes@
96000 Cardio-pulmonary resuscita- tion (e.g., cardiac arrest)	Sv.&	
96020 Electrical conversion of arrhy- thmia, external (independent procedure)	100.0	4.0
96030 Chemotherapy for malignant disease, parenteral	Sv.&	
96035 infusion (continuous or inter- mittent) (for catheter place- ment, see 36640)	BR+	
96040 perfusion	BR+	
96050 intracavitary	BR+	

(For radioactive isotope therapy, see 79000-79400)

96100 Desensitization (e.g., horse se- rum)	BR+
96150 Gastric lavage treatment (e.g., ingested poisons)	Sv.&
96200 Hyperbaric oxygen pressuriza- tion, initial	BR+
96201 subsequent	BR+
96250 Hypothermia, regional	BR+
96255 total body	BR+
96400 Intermittent positive pressure treatment (IPPB), initial or subsequent	8.0
96450 Phlebotomy, therapeutic (inde- pendent procedure)	20.0
96460 Epidural blood patch	72.0

[Order 75-39, § 296-21-085, filed 11/28/75, effective
1/1/76; Order 74-7, § 296-21-085, filed 1/30/74; Or-
der 68-7, § 296-21-085, filed 11/27/68, effective
1/1/69.]

**WAC 296-21-090 Special dermatological proce-
dures.**

	Unit Value
(List in addition to office visit.)	

	Unit Value
96900 Actinotherapy (ultraviolet light), local	2.0
96905 general	5.0
96920 Galvanic iontophoresis	5.0

[Order 74-7, § 296-21-090, filed 1/30/74; Order 68-7, § 296-21-090, filed 11/27/68, effective 1/1/69.]

WAC 296-21-095 Physical medicine. The following values apply only when these services are under the continuous and direct supervision of a physician who is "Board Qualified" in the field of physical medicine and rehabilitation and are carried out by the physician or Registered Physical Therapist or a Physical Therapist Assistant serving under the direction of a Registered Physical Therapist, employed by him, except as noted in 97070. Physiatrists prescribing and supervising physical therapy by a Registered Physical Therapist, on a referral basis, may be compensated on the basis of an initial office visit and followup visits not to exceed once weekly, in addition to the physical therapy.

(For fabrication of splints, bracing and other supportive devices, see 99070)

(For muscle testing, range of joint motion, electromyography, etc., see 95830-95930)

	Unit Value
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Modalities

97000 Office visit with one of the following modalities to one area	12.0
(a) Hot or cold packs	
(b) Traction, mechanical	
(c) Electrical stimulation (unattended)	
(d) Vasopneumatic devices	
(e) Paraffin bath	
(f) Microwave	
(g) Whirlpool	
(h) Diathermy	
(i) Infrared	
(j) Ultraviolet	
97050 Office visit with two or more modalities to same area	13.0
97070 In remote isolated areas only, where there is no Registered Physical Therapist or Physical Therapist Assistant serving under the direction of a Registered Physical Therapist within reasonable distance, treatment by any of the following modalities given in a physician's office, hospital, nurse practitioner clinic, by other than [than] a Registered	

Physical Therapist, will be allowed 5.0
Procedures

(Physician or therapist is required to be in constant attendance)

97100 Office visit with one of the following procedures to one area, initial 30 minutes	16.0
(a) Therapeutic exercises	
(b) Neuromuscular re-education	
(c) Functional activities	
(d) Gait training	
(e) Electrical stimulation (manual)	
(f) Traction, manual	
(g) Massage	
(h) Contrast baths	
(i) Ultrasound	
97101 each additional 15 minutes	5.0
97200 Office visit including combination of any modality(s) and procedure(s), initial 30 minutes	16.0
97201 each additional 15 minutes	5.0
97220 Hubbard tank, initial 30 minutes	24.0
97221 each additional 15 minutes (maximum allowance, one hour)	5.0
97240 Pool therapy or Hubbard tank with therapeutic exercises, initial 30 minutes	30.0
97241 each additional 15 minutes (maximum allowance, one hour)	6.0
97260 Manipulation (cervical, thoracic, lumbosacral, sacroiliac, hand, wrist, etc.), one area (independent procedure) performed by an osteopathic physician	16.0
97261 each additional area	8.0
(For manipulation under general anesthesia, see appropriate anatomic section in Musculoskeletal System)	
97500 Orthotics training (dynamic bracing, splinting, etc.) upper extremities, initial 30 minutes	24.0
97501 each additional 15 minutes	12.0
97520 Prosthetic training, initial 30 minutes	24.0
97521 each additional 15 minutes	12.0
97540 Activities of daily living (ADL) and diversional activities, initial 30 minutes	24.0
97541 each additional 15 minutes	12.0

Tests and Measurements

(For muscle testing, manual or electrical, joint range of motion, electromyography or nerve velocity determination, see 95830-95930)

	Unit Value
97700 Office visit including one of the following tests or measurements, with report, initial 30 minutes	24.0
(a) Orthotic "check-out"	
(b) Prosthetic "check-out"	
(c) Activities of daily living "check-out"	
97701 each additional 15 minutes	12.0
97720 Extremity testing for strength, dexterity or stamina, initial 30 minutes	24.0
97721 each additional 15 minutes	12.0
97740 Kinetic activities to increase coordination, strength and/or range of motion, one area (i.e., any two extremities or trunk), initial 30 minutes	24.0
97741 each additional 15 minutes	12.0

[Order 76-34, § 396-21-095, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-21-095, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-21-095, filed 1/30/74; Order 70-12, § 296-21-095, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-095, filed 11/27/68, effective 1/1/69.]

WAC 296-21-125 Anesthesia. (1) Values for anesthesia services are listed for each procedure in the surgical section and for certain procedures in other sections. These values are to be used only when the anesthesia is personally administered by a licensed physician and surgeon who remains in constant contact attendance during the procedure for the sole purpose of rendering such anesthesia service. These values include usual pre- and post-operative visits, the administration of the anesthetic and the administration of fluids and/or blood incident to the anesthesia or surgery.

(2) "STANDBY SERVICES": When an anesthesiologist is required to participate in the general care of the patient during a surgical procedure, but does not administer anesthesia, these services may be charged on the basis of detention or on the basis of the indicated anesthesia value in accordance with the extent of the services rendered.

(3) In procedures where no value is listed, the basic portion of the calculated value will be the same as listed for a comparable procedure.

(4) Where unusual detention with the patient is essential for the safety and welfare of such patient, see 99038, 99040.

(5) Local infiltration, digital block or topical anesthesia administered by the operating surgeon is included in the unit value for the original surgical procedure.

(6) SUPPLEMENTAL SKILLS: When warranted by the necessity of supplemental skills, values for the services of the two or more physicians will be allowed.

(7) Adjunctive services provided during anesthesia and certain other circumstances may warrant an additional charge.

ANESTHESIA MODIFIERS

Since the values of anesthesia services are related to the procedure for which the anesthesia was performed, the anesthesia service is billed under the code number of the procedure. Add appropriate anesthesia modifier -40 to -49 to the procedure number to indicate that billing is for anesthesia service and not the medical or surgical procedure.

Listed values for most procedures may be modified under certain circumstances. When applicable, the modifying circumstances should be identified by the addition of the appropriate "modifier code number" (including hyphen) after the usual procedure number. The value should be listed as a single modified total for the procedure. (When multiple modifiers are applicable to a single procedure, see modifier code -49.)

Unit
Value

-40 **ANESTHESIA SERVICE:** Add this modifier (-40) to the usual procedure number and use value listed in "Anes." column for normal, uncomplicated anesthesia.

(For therapeutic hypothermia, see 96250, 96255)

-47 **ANESTHESIA BY SURGEON:** When regional or general anesthesia is provided by the surgeon use the "Basic" anesthesia value without the added value for time. (Note: Surgical units and anesthesia units are not the same dollar value.) List separately from the surgical service provided and identify by adding this modifier (-47) to the usual procedure number.

(For local infiltration, digital block or topical anesthesia, see WAC 296-21-125, item 5.)

-49 **MULTIPLE ANESTHESIA MODIFIERS:** Two or more modifiers may be necessary to identify the anesthesia service (e.g., anesthesia performed on a critically ill patient under hypothermic technique). Identify by adding this modifier (-49) to the usual procedure number and briefly indicate the modifying circumstances **BR+**

[Order 74-7, § 296-21-125, filed 1/30/74; Order 68-7, § 296-21-125, filed 11/27/68, effective 1/1/69.]

WAC 296-21-128 Special services and billing procedures—Anesthesia.

	Unit Value
(ANESTHESIA)	
99105 Anesthesia risk as when patient has incapacitating systemic disease that is constant threat to life	2.0
99110 Anesthesia complicated by prone position and/or intubation to avoid surgical field	1.0
99115 Anesthesia complicated by total body hypothermia above 30°C	5.0
99120 below 30°C	10.0
99125 Anesthesia complicated by extracorporeal circulation, e.g., heart pump oxygenator bypass or pump assist, with or without hypothermia	10.0
99130 Anesthesia complicated by hyperbaric or compression chamber pressurization	BR+
99135 Anesthesia employed in controlled hypotension.	

[Order 74-7, § 296-21-128, filed 1/30/74.]

WAC 296-21-130 Calculation of total anesthesia values. The total anesthesia value is calculated by adding the listed basic value and time units.

A basic value is listed for most procedures. This includes the value of all anesthesia services except the value of the actual time spent administering the anesthesia or in unusual detention with the patient.

The time units are computed by allowing one unit for each 12 minutes of anesthesia time. Anesthesia time begins when the anesthesiologist starts physically to prepare the patient for the induction of anesthesia in the operating room area (or its equivalent) and ends when the anesthesiologist is no longer in constant attendance (when the patient may be safely placed under post-operative supervision).

For example, in a procedure with a basic value of 5.0 units requiring two hours and forty-five minutes of anesthesia time, the time units total 14.0 and are added to the basic value of 5.0, resulting in a value of 19.0 units for this anesthesia service.

When multiple surgical procedures are performed during the same period of anesthesia, only the greater basic value of the various surgical procedures will be used. For example, when a "D & C" with a basic value of 3.0 units is followed by a hysterectomy with a basic value of 5.0 units during the same period of anesthesia, the basic value to be used is 5.0 units. To this value are added the time units applicable for the entire period of anesthesia time for the multiple procedures performed.

Basic value (as listed or modified) + time units =
TOTAL ANESTHESIA VALUE.

[Order 74-7, § 296-21-130, filed 1/30/74; Order 70-12, § 296-21-130, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-21-130, filed 11/27/68, effective 1/1/69.]

**Chapter 296-22 WAC
SURGICAL FEES**

WAC

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- 296-22-017 Unlisted service or procedure.
- 296-22-01701 Special report.

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- 296-22-023 Repair—Simple.
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- 296-22-027 Destruction.
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296-22-057, 296-22-058, 296-22-059, 296-22-060, 296-22-065, 296-22-070, 296-22-075, 296-22-076, 296-22-077, 296-22-078, 296-22-085, 296-22-086, 296-22-090, 296-22-101, 296-22-102, 296-22-117, 296-22-121, 296-22-126, 296-22-127, 296-22-128, 296-22-256, 296-22-320, 296-22-335, 296-22-366, 296-22-376, 296-22-380, and 296-22-400. [Order 68-7, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.

SURGERY

WAC 296-22-010 General information and instructions. (1) Listed values for all surgical procedures include the surgery, local infiltration, digital block or topical anesthesia when used and the normal uncomplicated follow-up care for the period indicated in days in the column headed "Follow-up Days".

(2) Follow-up care for diagnostic procedures (e.g., endoscopy, injection procedures for radiography, etc.) includes only that care related to recovery from the diagnostic procedure itself. Care of the condition for which the diagnostic procedure was performed or other concomitant conditions is not included and may be charged for in accordance with the services rendered.

(3) Follow-up care for therapeutic surgical procedures includes only that care usually a part of the surgical service. Complications, exacerbations, recurrence or the presence of other diseases or injuries requiring additional services concurrent with the procedure(s) or during the listed period of normal follow-up care may warrant additional charges. (See modifier -68).

When an additional surgical procedure(s) is carried out within the listed period of follow-up care for a previous surgery, the follow-up periods will continue concurrently to their normal terminations.

(4) **PRE-OPERATIVE VISITS AND SERVICES:** Under most circumstances the immediate pre-operative visit in the hospital or elsewhere necessary to examine the patient, complete the hospital records, and initiate the treatment program is included in the listed value for the surgical procedure.

Additional charges may be warranted for pre-operative services under the following circumstances:

(a) When the pre-operative visit is the initial visit (e.g., an emergency, etc.) and prolonged detention or evaluation is required to prepare the patient or to establish the need for and type of surgical procedure.

(b) When the pre-operative visit is a consultation as defined in WAC 296-21-030.

(c) When procedures not usually part of the basic surgical procedure (e.g., bronchoscopy prior to chest surgery, etc.) are provided during the immediate pre-operative period.

(5) **CONCURRENT SERVICES BY MORE THAN ONE PHYSICIAN:** Charges for concurrent services of two or more physicians may be warranted under the following circumstances:

(a) Medical services provided during the surgical procedure or in the post-operative period (e.g., diabetic management, operative monitoring of cardiac or brain conditions, management of post-operative electrolyte imbalance, etc.).

(b) **TWO SURGEONS:** Under certain circumstances the skills of two surgeons (e.g., a urologist and a general surgeon in the creation of an ileal conduit, etc.). By prior agreement, the total value may be apportioned in relation to the responsibility of work done. The total value may be increased by 25% in lieu of the assistant's charge. (See modifier -62).

(c) **CO-SURGEONS:** Under certain circumstances, two surgeons (usually with similar skills) may function simultaneously as primary surgeons performing distinct parts of a total surgical service (e.g., two surgeons simultaneously applying skin grafts to different parts of the body of the same patient). By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by an appropriate amount in lieu of the usual assistant's charge. (See modifier -64).

(d) **SURGICAL TEAM:** Under some circumstances highly complex procedures requiring the concomitant services of several physicians, often of different specialties, plus other highly skilled, specially trained personnel and various types of complex equipment are carried out under the surgical team concept with a single, global fee for the total service. The services included in the "global" charge vary widely and no single value can be listed. The value should be supported by a report to include itemization of the physician(s) services, paramedical personnel and equipment included in the "global" charge. (See modifier -66).

(6) **ASTERISK (*) ITEMS:** Where an asterisk (*) precedes a procedure number and its value, the following rules apply:

(a) The listed value is for the surgical procedure only

(b) All post-operative care is to be added on a fee-for-service basis

(c) When the asterisk (*) procedure is carried out at the time of the initial office visit and this procedure constitutes the major service provided, add 0.24 surgical units in lieu of the usual initial visit (e.g., 90000 or 90010).

(d) When the asterisk (*) procedure is carried out as part of an office, hospital or other visit involving significant identifiable, additional services (e.g., removal of a minor skin lesion at the time of a comprehensive history and physical examination, etc.), list the appropriate visit and listed value for that visit in addition to listing the asterisk procedure and its value.

(e) The emergency room will be considered the office for those physicians providing regular emergency room care to the hospital and fees will be allowed on this basis.

(7) **MULTIPLE OR BILATERAL SURGICAL PROCEDURES:**

(a) When multiple or bilateral surgical procedures which add significant time or complexity to patient care are performed at the same operative session (See modifier -50).

(b) Incidental procedures (e.g., incidental appendectomy, incidental scar incision, puncture of ovarian cysts, simple lysis of adhesions, simple repair of hiatal hernia, etc.) do not warrant an additional charge. (See modifier -52).

(8) **SURGERY AND FOLLOW-UP CARE PROVIDED BY DIFFERENT PHYSICIANS:** When one physician performs the surgical procedure itself and another provides the follow-up care, the value may be apportioned between them by agreement along with notification to the Department of the fee distribution. (See modifier -54 or -55).

(9) **ANESTHESIA BY SURGEON:** When regional or general anesthesia is provided by the surgeon, value as "Basic" value for anesthesia procedure without added value for time. (See modifier -47) (For local infiltration, digital block or topical anesthesia, see WAC 296-22-010, item 1).

(10) In cases where the claimant does not survive, the percentage of the flat fee paid the physician shall be commensurate with the services rendered.

Surgery modifiers

(For other modifiers, see appropriate sections.)

Listed values for most procedures may be modified under certain circumstance as listed below. When applicable, the modifying circumstance should be identified by the addition of the appropriate "modifier code number" (including the hyphen) after the usual procedure number (e.g., repair of small laceration—procedure number 12000—performed on a new patient would be billed as 12000-58). The value should be listed as a single, modified total for the procedure. When multiple modifiers are applicable, use modifier code -99.

Unit Value

-22 **UNUSUAL SERVICES:** When the services provided are greater than those usually required for the listed procedure, identify by adding this modifier (-22) to the usual procedure number. List modified value. May require report.

-47 **ANESTHESIA BY SURGEON:** When regional or general anesthesia is provided by the surgeon, use the "basic" anesthesia value without the added value for time. (Note: Surgical units and anesthesia units are not of the same dollar values.) List separately from the surgical service provided and identify by adding this modifier (-47) to the usual procedure number. (For local infiltration, digital block or topical anesthesia, see WAC 296-21-125, item 5.)

-50 **MULTIPLE OR BILATERAL PROCEDURES:** When multiple or bilateral procedures which add significant time or complexity to patient care are provided at the same operative session, identify and value the first or major procedure as listed. Identify secondary or lesser

	Unit Value		Unit Value
		procedure(s) by adding this modifier (-50) to the usual procedure number(s) and value at 50% of the listed value(s) unless otherwise indicated.	
-52		REDUCED VALUES: Under certain circumstances, the listed value for a procedure is reduced or eliminated because of ground rules, common practice, or at the physician's election. For instance:	
		(a) Incidental procedures (e.g., incidental appendectomies, incidental scar excisions, puncture of ovarian cysts, simple lysis of adhesions, simple repair of a hiatal hernia, etc.) do not warrant an additional charge.	
		(b) When the listed value is reduced in conformity with a ground rule (e.g., rereduction of a fracture).	
		(c) When charges for multiple procedures (e.g., multiple lacerations, etc.) are reduced at the physician's election to achieve an appropriate total charge.	
		Under any of these or similar circumstances, the services provided can be identified by their usual procedure numbers and the use of a reduced value indicated by adding this modifier (-52) to the procedure number. (Use of this modifier provides a means of reporting services at reduced charge without disturbing usual relative values.)	
-54		SURGICAL PROCEDURE ONLY: When one physician performs the surgical procedure itself and another provides the follow-up care, the value may be apportioned between them by agreement. Identify the surgeon's services by adding this modifier (-54) to the usual procedure number.	
-55		FOLLOW-UP CARE ONLY: When one physician performs the surgical procedure itself and another provides the follow-up care, the value may be apportioned between them by agreement. Identify the services of the physician providing follow-up care by adding this modifier (-55) to the usual procedure number.	
	-58	ASTERISK (*) PROCEDURE: When the asterisk (*) is carried out at the time of the initial office visit and this procedure constitutes the major service provided at that visit, identify by adding this modifier (-58) to the usual procedure number and, in lieu of the usual initial visit, add	0.24
	-62	TWO SURGEONS: Under certain circumstances the skills of two surgeons (usually with different skills) may be required in the management of a specific surgical problem (e.g., a urologist and a general surgeon in the creation of an ileal conduit, etc.) By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by 25% in lieu of the assistant's charge. Under these circumstances the services of each surgeon should be identified by adding this modifier (-62) to the joint procedure number(s) and valued as agreed upon.	
		(Usual charges for surgical assistance may also be warranted if still another physician is required as part of the surgical team.)	
	-64	CO-SURGEONS: Under certain circumstances, two surgeons (usually with similar skills) may function simultaneously as primary surgeons performing distinct parts of a total surgical service (e.g., two surgeons simultaneously applying skin grafts to different parts of the body or two surgeons repairing different fractures in the same patient). By prior agreement, the total value may be apportioned in relation to the responsibility and work done. The total value may be increased by an appropriate amount in lieu of the usual assistant's charge. Under these circumstances the services of each surgeon should be identified by adding this modifier (-64) to the joint procedure number(s) and valued as agreed upon.	
		(Usual charges for surgical assistance may also be warranted if still another physician is required as part of the surgical team.)	

-66 SURGICAL TEAM: Under some circumstances, highly complex procedures requiring the concomitant services of several physicians, often of different specialties, plus other highly skilled, specially trained personnel and various types of complex equipment are carried out under the "surgical team" concept with a single, "global" fee for the total service. The services included in the "global" charge vary widely from place to place and no single value can be listed for these "global" charges. These circumstances should be identified by adding this modifier (-66) to the basic procedure number. The value should be supported by a report to include itemization of the physician(s) services, paramedical personnel and equipment included in the "global" charge BR+

-68 COMPLICATIONS: Complications or circumstances requiring unusual additional services during the listed follow-up period may warrant additional charges on a fee-for-service basis. Identify these conditions by adding this modifier (-68) to the usual procedure number(s) for the additional service(s) rendered and indicate the appropriate value(s). May require a report.

-80 ASSISTANT SURGEON: Surgical assistant services are identified by adding this modifier (-80) to the usual procedure number(s) and are valued at 20% of the listed value of the surgical procedure(s)

OR

-81 MINIMUM ASSISTANT SURGEON ALLOWANCE: Identify by adding this modifier (-81) to the usual procedure number and value at 1.7

-99 MULTIPLE MODIFIERS: Under certain circumstances, multiple modifiers may be applicable. One or more such modifiers may be taken from another section, as applicable.

For example, a physician might be called to the hospital emergency room (modifier -18, page 20) to perform a procedure preceded by an

Unit Value
 asterisk (modifier -58). In such situations, he should add this modifier (-99) to the procedure number and briefly indicate the circumstances BR+
 [Order 74-7, § 296-22-010, filed 1/30/74; Order 70-12, § 296-22-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-22-010, filed 11/27/68, effective 1/1/69.]

WAC 296-22-016 Footnotes.

- + BR: By Report; see WAC 296-20-010, item 11, for detailed information.
 - @ Listed units represent basic anesthesia value only; add value for time. See WAC 296-21-130 for calculating total anesthesia values.
 - * See WAC 296-22-010, item 6, before using.
 - = See WAC 296-22-010, items 1, 2, 3, 4 for meaning.
 - & Sv: see WAC 296-20-010, item 13 before using.
- [Order 74-7, § 296-22-016, filed 1/30/74.]

WAC 296-22-017 Unlisted service or procedure. A service or procedure may be provided that is not listed in this fee schedule. When reporting such a service, the appropriate "Unlisted Procedure" code may be used to indicate the service, identifying it by "Special Report" as discussed in WAC 296-22-01701 below. The "Unlisted Procedures" and accompanying codes for SURGERY are as follows:

17499	Unlisted procedure, integumentary system
29799	Unlisted procedure, musculoskeletal system
32999	Unlisted procedure, respiratory system
37799	Unlisted procedure, cardiovascular system
46999	Unlisted procedure, digestive system
53899	Unlisted procedure, urinary system
55899	Unlisted procedure, male genital system
58999	Unlisted procedure, female genital system
59899	Unlisted procedure, maternity care and delivery
64899	Unlisted procedure, nervous system
68999	Unlisted procedure, ophthalmological system
69989	Unlisted procedure, otological system
69999	Unlisted procedure, miscellaneous surgical

[Order 76-34, § 296-22-017, filed 11/24/76, effective 1/1/77.]

WAC 296-22-01701 Special report. A service that is rarely provided, unusual, variable, or new may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent,

and need for the procedure; and the time, effort, and equipment necessary to provide the service. Additional items which may be included are: Complexity of symptoms, final diagnosis, pertinent physical findings (such as size, location, and number of lesion(s), if appropriate), diagnostic and therapeutic procedures (including major and supplementary surgical procedures, if appropriate), current problems, and followup care. [Order 76-34, § 296-22-01701, filed 11/24/76, effective 1/1/77.]

INTEGUMENTARY SYSTEM

WAC 296-22-020 Skin, mucous membrane, subcutaneous and areolar tissues.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*10000	Incision and drainage of infected or noninfected subcutaneous cyst, one lesion	*0.4	0 3.0
10001	second lesion	0.2	
10002	over two, each additional lesion	0.1	
*10020	Incision and drainage of furuncle	*0.4	0 3.0
*10040	Acne surgery: marsupialization, opening, or removal of multiple milia, comedones, cysts, pustules, etc.	*0.3	0 3.0
*10060	Incision and drainage of abscess (e.g., carbuncle, suppurative hidradenitis and other cutaneous or subcutaneous abscesses), simple	0.4	0 3.0
10061	complicated	BR+	3.0
*10080	Drainage of pilonidal cyst, simple	*0.4	0 3.0
10081	complicated	BR+	3.0
*10100	Drainage of onychia or paronychia	*0.4	0 3.0
10101	multiple or complicated	BR+	3.0
*10120	Incision and removal of foreign body, subcutaneous tissues, simple	*0.4	0 3.0
10121	complicated	BR+	3.0
*10140	Drainage of hematoma, simple	*0.4	0 3.0
10141	complicated	BR+	3.0
*10160	Puncture aspiration of abscess or hematoma	*0.3	0 3.0

[Order 74-7, § 296-22-020, filed 1/30/74; Order 68-7, § 296-22-020, filed 11/27/68, effective 1/1/69.]

WAC 296-22-021 Excision.

Follow-
Unit up
Value Days= Basic
Anes@

Debridement

(For dermabrasions, see 15780-15800)

(For nail debridement, see 11700-11711)

(For burn(s), see 16000-16030)

*11000	Debridement of extensively eczematous or infected skin up to 10% of the body surface	*0.4	0	3.0
11001	for each additional 10% of the body surface	0.2		3.0
11040	Debridement of abrasions	BR+		3.0

Excision and Simple Closure

(Not reconstructive surgery; for reconstructive surgery see "Repair-Complex.")

(For electro-surgical and other methods, see 17000 et seq.)

Biopsy

11100	Biopsy: Excision of skin, subcutaneous tissue or mucous membrane (including simple closure), unless otherwise listed (independent procedure)	0.6	7	3.0
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Benign Lesions

Excision (including simple closure) of benign cicatricial, fibrous, inflammatory, congenital, cystic, etc., lesion of skin, subcutaneous tissue or mucous membrane (see appropriate size and area below).

(For electro-surgical and other methods see 17000 et seq.)

*11200	Skin tags: Excision of multiple fibrocuteaneous tags, any area, up to 15 each additional 10 lesions	*0.4	0	3.0
11201		0.2		

		Follow- Unit up Basic Value Days= Anes@				Follow- Unit up Basic Value Days= Anes@			
	(For electro-surgical destruction, see 17200, 17201)								
	Other Benign Lesions (unless separately listed elsewhere), each lesion:				Scalp, neck, hands, feet, genitalia:				
	(For multiple lesions see WAC 296-22-010, item 7)				11620	lesion diameter up to 0.5 cm	2.0	90	3.0
					11621	lesion diameter 0.5 to 1.0 cm	3.0	90	3.0
					11622	lesion diameter 1.0 to 2.0 cm	4.0	90	3.0
	Trunk, arms or legs:					Face, ears, eyelids, nose, lips, mucous membrane:			
11400	lesion diameter up to 0.5 cm	0.6	15	3.0	11640	lesion diameter up to 0.5 cm	3.0	90	3.0
11401	lesion diameter 0.5 to 1.0 cm	0.8	15	3.0	11641	lesion diameter 0.5 to 1.0 cm	4.0	90	3.0
11402	lesion diameter 1.0 to 2.0 cm	1.0	15	3.0	11642	lesion diameter 1.0 to 2.0 cm	5.0	90	3.0
	Scalp, neck, hands, feet, genitalia:				11660	Lesion, diameter more than 2.0 cm, complicated or unusually located, any area	BR+		3.0
11420	lesion diameter up to 0.5 cm	0.8	15	3.0		Nails			
11421	lesion diameter 0.5 to 1.0 cm	1.0	15	3.0	*11700	Debridement nails, manual, five or less	*0.3	0	3.0
11422	lesion diameter 1.0 to 2.0 cm	1.2	15	3.0	11701	each additional five or less	0.15		
	Face, ears, eyelids, nose, lips, mucous membrane:				11710	electric grinder, five or less	*0.4	0	3.0
11440	lesion diameter up to 0.5 cm	1.0	15	3.0	11711	each additional five or less	0.2		
11441	lesion diameter 0.5 to 1.0 cm	1.2	15	3.0	*11730	Avulsion, nail plate, partial, or complete, simple, single	*0.4	0	3.0
11442	lesion diameter 1.0 to 2.0 cm	1.4	15	3.0	11731	second nail plate	0.2		
11460	Lesion, diameter more than 2.0 cm, or complicated, any area	BR+		3.0	11732	each additional nail plate	0.1		
	Malignant Lesions				11750	Excision of nail and nail matrix, partial or complete (e.g., ingrown or deformed nail), for permanent removal	2.0	30	3.0
	Excision (including simple closure) or treatment by any other method (except radiation or chemosurgery) of malignant lesion of skin or mucous membrane, to include local anesthesia, each lesion:					Miscellaneous			
	(For multiple lesions, see WAC 296-22-010, item 7)				11770	Excision of pilonidal cyst or sinus, simple	2.0	30	3.0
	Trunk, arms or legs:				11771	extensive	7.0	60	3.0
11600	lesion diameter up to 0.5 cm	1.2	90	3.0	11772	complicated	BR+		3.0
11601	lesion diameter 0.5 to 1.0 cm	1.6	90	3.0		Miscellaneous Lesions (use appropriate procedure number and state diagnosis)			
11602	lesion diameter 1.0 to 2.0 cm	2.0	90	3.0		Hemangioma (see 11400-11460, 13000-15730)			

	Follow- Unit up Value Days=	Basic Anes@
Hidrandenitis (see 10060, 11400-11422, 13000-15730)		
Lipoma (see 11400-11460, 13000-15730)		
Lymph node dissection (see 38700-38780)		
Ulcer—Vascular or inflammatory (see 11400-11460, 13000-15730)		

[Order 74-7, § 296-22-021, filed 1/30/74; Order 68-7, § 296-22-021, filed 11/27/68, effective 1/1/69.]

WAC 296-22-022 Introduction.

	Follow- Unit up Value Days=	Basic Anes@
*11900 Injection, intralesional (up to and including seven lesions)	*0.4 0	3.0
*11901 more than seven	*0.72 0	
(For veins, see 36470, 36471)		

[Order 74-7, § 296-22-022, filed 1/30/74; Order 68-7, § 296-22-022, filed 11/27/68, effective 1/1/69.]

WAC 296-22-023 Repair—Simple.

	Follow- Unit up Value Days=	Basic Anes@
Repair recent wound resulting in a linear repair:		
*12000 up to 2.5 cm, trunk, extremity, scalp or neck	*0.4 0	3.0
*12020 face, ear, eyelid, lip, nose, genitalia, mucous membrane	*0.6 0	3.0
*12100 2.5 cm to 6.0 cm, trunk, arms, legs	*0.6 0	3.0
*12120 scalp, neck, hands, feet, genitalia	*0.8 0	3.0
*12140 face, ears, eyelids, nose, lips, mucous membrane	*1.0 0	3.0
*12200 6.0 cm to 12.5 cm, trunk, arms, legs	*1.0 0	3.0
12220 scalp, neck, hands, feet, genitalia	BR+	3.0
12240 face, ears, eyelids, nose, lips, mucous		

	Follow- Unit up Value Days=	Basic Anes@
membrane	BR+	3.0
12300 over 12.5 cm	BR+	3.0
(For multiple wounds, see WAC 296-22-010, item 7 and modifier -52)		

[Order 74-7, § 296-22-023, filed 1/30/74; Order 68-7, § 296-22-023, filed 11/27/68, effective 1/1/69.]

WAC 296-22-024 Repair—Complex. Repair, complex (reconstructive surgery, complicated wound closure, skin grafts, etc.)

Values for the following procedures (13000-15730) are to be applied in situations requiring unusual and time-consuming techniques of repair to obtain the maximum functional and cosmetic result. Unless otherwise noted, the stated values include the creation of the defect and necessary preparation for repair, or the debridement and repair of complicated lacerations.

	Follow- Unit up Value Days=	Basic Anes@
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Direct Closure—Linear Repair

Excision and/or repair by direct closure of lesion or laceration resulting in a linear repair:		
13000 1.0 cm, forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	1.2 30	3.0
13020 eyelids, nose, ears and lips (see also 14800-14860, 40500-40530)	2.0 30	3.0
(for trunk and other areas see 11400-11660, 12000-12300)		
13100 1.0 cm to 2.5 cm, trunk	1.2 30	3.0
13120 scalp, arms and legs	1.8 30	3.0
13140 forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	2.4 30	3.0
13160 eyelids, nose, ears and lips (see also 14800-14860, 40500-40530)	3.0 30	3.0
13200 2.5 cm to 7.5 cm, trunk	3.0 30	3.0
13220 scalp, arms and		

		Follow- Unit up Value Days=	Basic Anes@
13240	legs	4.0	30
	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet . . .	6.0	30
13260	eyelids, nose, ears and lips (see also 14800-14860, 40500-40530)	8.0	30
13300	unusual, complicated or over 7.5 cm linear repair, any area	BR+	3.0
Adjacent Tissue Transfer or Rearrangement			

Excision and/or repair by adjacent tissue transfer or rearrangement (e.g., z-plasty, rotation flap, advanced flap, double pedicle flap):

(For skin graft or other procedure necessary to close secondary defect in procedures 14000-14860, see WAC 296-22-010, item 7)

14000	for defect up to 6 sq cm, trunk	4.0	60
14020	scalp, arms and legs	6.0	60
14040	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet . . .	8.0	60
14060	eyelids, nose, ears and lips	10.0	60
14100	defect size between 6 and 20 cm, trunk . . .	6.0	60
14120	scalp, arms and legs	8.0	60
14140	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet . . .	10.0	60
14160	eyelids, nose, ears and lips	14.0	60
14300	more than 20 sq cm, unusual or complicat- ed, any area	BR+	3.0

Eyelid, Full Thickness

Eyelid, full thickness,
excision and repair:

14800	by advancement		
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		Follow- Unit up Value Days=	Basic Anes@
	flaps, up to 1/4 eye- lid margin	10.0	60
14810	over 1/4 eyelid margin	12.0	60
14840	by transfer of tarso- conjunctival flaps from opposing eyelid, up to 2/3 of eyelid, one stage	12.0	60
14845	two stages	14.0	60
14850	total eyelid, one stage, lower lid	15.0	60
14855	upper lid	18.0	60
14860	second stage, upper or lower lid	2.0	60

[Order 74-7, § 296-22-024, filed 1/30/74; Order 68-7, § 296-22-024, filed 11/27/68, effective 1/1/69.]

WAC 296-22-025 Free skin grafts.

Values of free skin grafts are determined by the size and location of the defect (recipient area) and the type of graft. These values include simple debridement of granulations or recent avulsion.

(For excision of lesion or excisional preparation of recipient site, see 15000)

(For repair of the donor site requiring skin graft or local flaps, see WAC 296-22-010, item 7)

		Follow- Unit up Value Days=	Basic Anes@
15000	Excision and repair by free skin graft (excis- ional preparation or creation of recipient site):		
	When the defect requir- ing repair with a free skin graft is created by excision of essentially intact skin, scar or other lesion (including subcu- taneous tissues), identifi- fy this excisional procedure separately by using this procedure number and value at 50% of the listed value for the free skin graft to be used for the repair in accordance with its type, size and location .		3.0
	(For appropriate skin grafts, see 15050- 15261. List the free		

		Follow- Unit up Value Days=	Basic Anes@		Follow- Unit up Value Days=	Basic Anes@
	graft separately by its procedure number and value when the graft is applied (immediate or delayed).)					
*15050	Pinch, split or full thickness skin to cover small ulcer, tip of digit or other minimal open area (except on face, use 15100-15261) up to defect size 2 cm diameter	*1.2	0	3.0		
15100	Split skin graft, up to 100 sq cm (except 15050), trunk, scalp, arms, legs, hands and feet (except multiple digits)	6.0	45	3.0		
15101	each additional 100 sq cm or part thereof	1.2				
15120	face, mouth, neck, ears, genitalia or multiple digits	11.0	45	3.0		
15121	each additional 100 sq cm or part thereof	2.0				
15200	Full thickness, free, up to 20 sq cm, including direct closure of donor site, trunk	4.0	45	3.0		
15201	each additional 20 sq cm	2.0				
15220	scalp, arms and legs	6.0	45	3.0		
15221	each additional 20 sq cm	3.0				
15240	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	8.0	45	3.0		
	(For finger tip graft, see 15050)					
15241	each additional 20 sq cm	4.0				
15260	eyelids, nose, ears and lips	10.0	45	3.0		
15261	each additional 20 sq cm	5.0				
	(For repair of donor site requiring skin graft or local flaps, see WAC 296-22-010, item 7 and unit value modifier -50)					
Pedicule Flaps (skin and deep tissues)						
	Regions listed refer to the recipient area (not donor site) when flap is being attached in transfer or to the final site.					
	Regions listed refer to donor site when tube is formed for later transfer or when "delay" of flap is prior to transfer.					
	Values for following items 15500-15730 do NOT include extensive immobilization; for values for plaster casts, see 29000 et seq.					
	(For repair of donor site requiring skin graft or local flaps, see WAC 296-22-010, item 7 and modifier -50)					
15500	Form tube pedicle without transfer or major "delay" of large flap without transfer, trunk	7.0	45	3.0		
15505	scalp, arms and legs	7.0	45	3.0		
15510	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	7.0	45	3.0		
15515	eyelids, nose, ears and lips	7.0	45	3.0		
15540	Primary attachment of open or tubed pedicle flap to recipient site requiring minimal preparation, trunk	9.0	45	3.0		
15545	scalp, arms and legs	9.0	45	3.0		
15550	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands, feet	9.0	45	3.0		
15555	eyelids, nose, ears and lips	9.0	45	3.0		
	(For major debridement or excisional preparation of recipient area at the time of attachment of pedicle flap, see 15700-15730)					
15600	Intermediate "delay" of any flap, primary "delay" small flap or sectioning of pedicle of tubed or direct flap, trunk	4.0	45	3.0		
15610	scalp, arms and legs	5.0	45	3.0		
15620	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	6.0	45	3.0		
15630	eyelids, nose, ears and lips	6.0	45	3.0		
15650	Intermediate transfer of any pedicle flap (e.g.,					

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
	abdomen to wrist, "walking" tube, etc.), any location	BR+		3.0					
15700	Excision of lesion and/or excisional preparation of recipient site and attachment of direct or tubed pedicle flap, trunk	9.0	45	3.0	15820	(acid peel) of remaining face (eyelids, neck, shoulders, etc.)	16.0	90	3.0
15710	scalp, arms and legs	11.0	45	3.0	15822	Rhytidectomy, lower eyelids	12.0	30	3.0
15720	forehead, cheeks, chin, mouth, neck, axillae, genitalia, hands and feet	16.0	45	3.0	15824	upper eyelids	8.0	30	3.0
15730	eyelids, nose, ears and lips	16.0	45	3.0	15826	forehead	10.0	30	3.0
	(For revision, defatting or rearranging of transferred pedicle flap or skin graft, see 13000-14300)				15828	glabellar frown	8.0	30	3.0
					15828	cheeks, chin and neck	30.0	45	3.0
					15830	abdomen, legs, hips or buttocks (including lipectomy)	30.0	45	3.0
					15840	Facial nerve paralysis, free fascia grafts, including obtaining fascia	30.0	90	3.0
					15845	re-animation, muscle transfers	BR+		3.0
						(For nerve transfers, decompression or sutures, see 64755, 64945, 69720, 69740)			
Other Grafts									
15740	Island pedicle flap, scalp	12.0	90	3.0	[Order 74-7, § 296-22-025, filed 1/30/74; Order 68-7, § 296-22-025, filed 11/27/68, effective 1/1/69.]				
15750	Neurovascular pedicle flap, hand	10.0	90	3.0	WAC 296-22-026 Burns, local treatment.				
15760	Composite graft (full thickness of external ear or nasal ala)	10.0	45	3.0	Items 16000-16030 refer to local treatment of burned surface only.				
15770	Derma-fat-fascia-graft	12.0	60	3.0	List percentage of body surface involved and depth of burn.				
	(For breast, see 19320)				(For necessary related medical services (e.g., hospital visits, detention, etc.) in the management of burned patients, see appropriate services in Medicine section.)				
15775	Punch graft for hair transplant, 1 to 15, each punch graft	0.5	90	3.0					
15776	more than 15	BR+		3.0					
Miscellaneous Procedures									
15780	Abrasion of skin, total face, for removal of scars, tattoos, actinic changes (keratoses), etc., primary or secondary	12.0	90	3.0	(For skin graft, see 15100-15730)				
15785	regional (1/4 face, cheeks, chin, forehead or elsewhere) primary or secondary	4.0	90	3.0	*16000	Initial treatment, first degree, where no more than local treatment necessary	*0.3	0	
15790	Superficial chemo-surgery (acid peel), total face and neck	BR+		3.0	*16010	Dressings and/or debridement, initial or subsequent, under anesthesia, small	*0.8	0	3.0
15791	regional, face, neck, or elsewhere	BR+		3.0	*16015	large or with major debridement, per one-half hour	*2.0	0	3.0
15800	Combined abrasion of skin, total face with superficial chemo-surgery				*16020	without anesthesia, office or hospital, small	*0.4	0	
					*16025	medium (whole			

Surgical Fees

296-22-027

		Follow-			Follow-		
		Unit	up	Basic	Unit	up	Basic
		Value	Days=	Anes@	Value	Days=	Anes@
*16030	face or whole ex- tremity, etc.)	*0.6	0		17200, 17201), with or without curettement, one lesion	*0.4	0 3.0
	large (more than one extremity, etc.)	*0.8	0		(For multiple fibrocute- aneous tags, see 17200, 17201)		
[Order 74-7, § 296-22-026, filed 1/30/74; Order 68-7, § 296-22-026, filed 11/27/68, effective 1/1/69.]							
WAC 296-22-027 Destruction.							
		Follow-			Follow-		
		Unit	up	Basic	Unit	up	Basic
		Value	Days=	Anes@	Value	Days=	Anes@
	(For electro-surgical destruction of malig- nant skin lesions, see 11600-11660)				17101	second lesion . . .	0.2
	(For condylomata, see 46900-46930, 54050- 54065, 56500-56515)				17102	over two lesions, each additional lesion	0.1
*17000	Electro-surgical de- struction with or with- out surgical curettement of "active" leukoplakia, "active" actinic or senile kera- toses, keratoacanthom- as or facial nevi, to include local anesthesia, one lesion	*0.6	0	3.0	17103	complicated lesion(s)	BR+ 3.0
	(For other methods or lesions, see 17100- 17201)				*17110	flat (plane, juvenile) warts or molluscum contagiosum, milia, up to 15	*0.4 0 3.0
	(For multiple fibrocute- aneous tags, see 17200, 17201)					(Retreatment same as office visit)	
	second and third lesions, each	0.3			*17200	Electro-surgical de- struction of multiple fi- brocutaneous tags, up to 15	*0.4 0 3.0
17001	over 3 lesions, each additional lesion	0.15			17201	each additional 10 le- sions	0.2
17002	complicated lesion(s)	BR+		3.0		(For excision of fibro- cutaneous tags, see 11200, 11201)	
*17100	Electro-surgical de- struction (except 17000-17010) or chem- ocautery (mono-, bi-, trichlor-acetic acid, phenol, etc.) or cryo- cautery (liquid N ₂ , CO ₂ , etc.) of other BE- NIGN or "quiescent" PRE-MALIGNANT lesions of skin or mu- cous membrane (except				17300	Chemosurgery (Mohs type technique), malig- nancies of skin, includes removal of lesion and microscopic delineation of margins and base, first stage—fulgura- tion and application of chemicals	5.0 30 3.0
					17301	each subsequent treatment, up to five microscopic sections .	1.6 30 3.0
					17302	each additional microscopic section over five	0.2
						(For initiation or fol- low-up care of topical chemotherapy (e.g., 5 F.U. or similar agents), see appropriate office visits)	
					*17340	Cryotherapy (CO ₂ slush, liquid N ₂)	*0.3 0
					*17360	Chemical exfoliation for acne (acne paste, acid, etc.)	*0.3 0

		Follow-		Basic
	Unit	up		Anes@
	Value	Days=		
*17380	Electrolysis epilation, each 1/2 hour	*0.6	0	
	(For actinotherapy and galvanic iontophoresis, see 96900-96920)			

[Order 74-7, § 296-22-027, filed 1/30/74; Order 68-7, § 296-22-027, filed 11/27/68, effective 1/1/69.]

WAC 296-22-030 Breast—Incision.

	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	
*19000	Puncture aspiration of cyst	*0.4	0
19020	Mastotomy with exploration or drainage of abscess, deep	2.6	14 3.0

[Order 74-7, § 296-22-030, filed 1/30/74; Order 68-7, § 296-22-030, filed 11/27/68, effective 1/1/69.]

WAC 296-22-031 Breast—Excision.

	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	
*19100	Biopsy of breast, needle (independent procedure)	*0.6	0
19101	incisional	3.6	30 3.0
19120	Excision of cyst, fibroadenoma or other benign tumor, aberrant breast tissue, duct lesion or nipple lesion (except 19140-19161) male or female, unilateral	5.0	30 3.0
19121	bilateral	6.0	30 3.0
19140	Mastectomy for gynecomastia through circumareolar incision, unilateral	8.0	60 3.0
19141	bilateral	10.0	60 3.0
19160	Partial mastectomy (quadrectomy or more), unilateral	6.0	60 3.0
19161	bilateral	8.0	60 3.0
19180	Simple mastectomy, complete, unilateral	8.0	45 3.0
	(For gynecomastia, see 19140, 19141)		
19182	subcutaneous, unilateral	10.0	60 3.0
19184	with immediate prosthetic implant	14.0	90 3.0

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	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	
	(For supplemental skills of two surgeons, see WAC 296-22-010 item 5 and modifier -62)		
19186	delayed prosthetic implant, unilateral	12.0	90 3.0
19187	bilateral	16.0	90 3.0
19200	Radical mastectomy, including breast, pectoral muscles and axillary lymph nodes, unilateral	18.0	60 3.0
19210	including internal mammary lymph nodes (Urban type procedure)	26.0	60 11.0
19240	Modified radical mastectomy, with modified axillary dissection but leaving pectoral muscles, unilateral	16.0	60 3.0
19260	Excision of chest wall tumor involving ribs	BR+	9.0
19270	Excision of chest wall tumor involving ribs plus plastic reconstruction, with or without mediastinal lymphadenectomy	BR+	9.0
	Repair		
19300	Mammoplasty, plastic operation on breasts, reduction or repositioning, bilateral, one stage	40.0	90 3.0
19301	two stage	BR+	3.0
19310	augmentation, prosthetic (except 19184-19187), unilateral	18.0	90 3.0
19311	bilateral	30.0	90 3.0
19320	derma-fat fascia, unilateral	20.0	90 3.0
	[Order 74-7, § 296-22-031, filed 1/30/74; Order 68-7, § 296-22-031, filed 11/27/68, effective 1/1/69.]		

MUSCULOSKELETAL SYSTEM

WAC 296-22-035 General information.

General: Certain procedures (e.g., incision of soft tissue abscess, drainage of infected bursa, biopsy, arthrocentesis, insertion of wires or pins, etc.) are common to all anatomic areas and are listed below under "General." Specific procedures are listed under the appropriate anatomic areas. Casts and strapping are listed at the end of the section.

Listed values include the application and removal of the first cast or traction device only. Subsequent replacement of cast and/or traction device during the listed period of follow-up care warrants additional charges.

Re-reduction of a fracture and/or dislocation, performed by the primary physician, may warrant a reduction in the value of the service. Indicate that the value has been reduced by adding modifier -52 to the usual procedure number and value as appropriate.

Bone, cartilage and fascial grafts: Listed values for most graft procedures include obtaining of the graft. When a second surgeon obtains the graft, the value of the total procedure may be apportioned between the surgeons. Modifier -62 and procedures 20900-20922 are not to be used in conjunction with procedures which include a graft as part of the descriptor. Procedures 20900-20922 can be used in those unusual circumstances when a graft is used that is not included in the descriptor.

When an alloplastic implant or non-autogenous graft is used in a procedure which "includes obtaining graft," the value is to be reduced by an appropriate amount. Identify this circumstance by adding modifier -52 to the procedure number.

Plastic and metallic implant or non-autogenous graft materials are to be valued at the cost to the physician including an appropriate handling or shaping charge where applicable. See procedure 99070. [Order 74-7, § 296-22-035, filed 1/30/74; Order 68-7, § 296-22-035, filed 11/27/68, effective 1/1/69.]

WAC 296-22-036 General—Incision.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
*20000	Incision of superficial soft tissue abscess, secondary to osteomyelitis	*0.4	0	3.0
20005	deep or complicated	BR+		3.0
*20040	Drainage of infected bursa	*0.6	0	3.0

[Order 74-7, § 296-22-036, filed 1/30/74; Order 68-7, § 296-22-036, filed 11/27/68, effective 1/1/69.]

WAC 296-22-037 General—Excision.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
	(For bone marrow aspiration, see 85110)			
20200	Biopsy, muscle, superficial	1.2	7	3.0
20205	deep	2.4	15	3.0
20220	bone, trochar, superficial (e.g., ilium, sternum, spinous process, ribs, etc.)	1.2	7	3.0

Follow-
Unit up Basic
Value Days= Anes@

20225	deep (e.g., vertebral body, femur, etc.)	4.0	15	3.0
20240	excisional, superficial (e.g., ilium, sternum, spinous process, ribs, etc.)	3.0	21	3.0
20245	deep (e.g., humerus, ischium, femur, etc.)	5.0	30	3.0
20250	vertebral body	BR+		BR+
20290	Sequestrectomy for osteomyelitis or bone abscess	BR+		3.0

[Order 74-7, § 296-22-037, filed 1/30/74; Order 68-7, § 296-22-037, filed 11/27/68, effective 1/1/69.]

WAC 296-22-038 Introduction or removal.

Follow-
Unit up Basic
Value Days= Anes@

	(For injection procedure for arthrography, see 23350, 27370)			
20500	Injection of sinus tract, therapeutic (independent procedure)	0.4	0	
	(For injection procedure of sinus tract and X-rays, see 76080)			
*20520	Removal of foreign body in muscle, simple	*1.2	0	3.0
20525	deep or complicated	BR+		3.0
*20550	Injection, tendon sheath, ligament or trigger points	*0.4	0	
*20600	Arthrocentesis, aspiration or injection, small joint (e.g., fingers, toes, etc.)	*0.3	0	
*20605	intermediate joint or bursa (e.g., temporomandibular, acromioclavicular, wrist, elbow or ankle joint; olecranon bursa, etc.)	*0.4	0	
*20610	major joint or bursa (e.g., shoulder, hip, knee joint, subacromial bursa, etc.)	*0.6	0	

		Follow- Unit up Value Days=	Basic Anes@
*20650	Insertion of wire or pin for skeletal traction, including removal (independent procedure)	*1.2	0 3.0
20660	Application of caliper or tongs, including removal (independent procedure)	3.0	0 3.0
20665	Removal of caliper or tongs applied by another physician	0.3	0
*20670	Removal of buried wire, pin, screw, metal band, rod, nail or plate, superficial (independent procedure)	*0.6	0 3.0
20680	deep	3.6	21 3.0

[Order 74-7, § 296-22-038, filed 1/30/74; Order 68-7, § 296-22-038, filed 11/27/68, effective 1/1/69.]

WAC 296-22-039 Repair, revision or reconstruction.

		Follow- Unit up Value Days=	Basic Anes@
	(For secondary wound closure or repair, see repair, simple, 12000-12300)		
20800	Repair of deep wound involving muscle, tendon and/or nerve (except hand or foot) BR+		3.0
	(For tendon repair of hand, see 26400-26424; for foot, see 28200-28214; for nerve repairs, see 64700-64740)		

[Order 74-7, § 296-22-039, filed 1/30/74; Order 68-7, § 296-22-039, filed 11/27/68, effective 1/1/69.]

WAC 296-22-040 Grafts (or implants).

Values for obtaining autogenous bone, cartilage or fascia lata grafts through separate incisions are to be used only when graft is not already listed as part of basic procedure. Listed value applies and WAC 296-22-010, item 7 is not to be applied to procedures 20900-20922.

(For alloplastic or heterologous grafts, see instructions, WAC 296-22-035)

		Follow- Unit up Value Days=	Basic Anes@
20900	Bone, minor or small graft (e.g., dowel or button), any donor area	2.4	0 3.0
20902	major or large	4.8	0 3.0
20910	Cartilage, costochondral	4.8	0 3.0
20920	Fascia lata by stripper .	2.0	0 3.0
20922	by incision and area exposure, complex or sheet	4.0	0 3.0

[Order 74-7, § 296-22-040, filed 1/30/74; Order 68-7, § 296-22-040, filed 11/27/68, effective 1/1/69.]

WAC 296-22-042 Head.

		Follow- Unit up Value Days=	Basic Anes@
	(Skull, facial bones and temporomandibular joint)		
	Incision		
	(For drainage of superficial abscess and hematoma, see 20000)		
	Excision		
	(For biopsy, see 20220, 20240)		
21020	Craniectomy or sequestrectomy for osteomyelitis	BR+	8.0
	(For other craniectomies, see 61300 et seq.)		
21030	Excision of tumor of facial bone other than mandible	BR+	5.0
21040	Excision of benign cyst or tumor of mandible, simple	5.0	90 5.0
21041	complex	BR+	5.0
	(For bone graft, see 21215)		
21050	Arthrectomy, temporomandibular joint, unilateral	18.0	90 5.0
21060	Meniscectomy, temporomandibular joint . . .	18.0	90 5.0
	Introduction or Removal		
	(For application or removal of caliper or tongs, see 20660, 20665)		
*21100	Application of halo type appliance for maxillo-		

Surgical Fees

296-22-042

		Follow- Unit up Value Days=	Basic Anes@		Follow- Unit up Value Days=	Basic Anes@
	facial fixation, etc., in- cludes removal (inde- pendent procedure) (See also 29000)	*2.0	0	3.0		
Repair, Revision or Reconstruction						
	(For cranioplasty, see 62140, 62141)					
21200	Osteoplasty of mandible for prognathism or mic- rognathism	30.0	90	5.0		
21210	Bone graft, nasal, max- illary and malar areas (includes obtaining graft)	20.0	120	5.0		
	(For cleft palate repair, see 42200-42225)					
21215	mandible (includes obtaining graft)	20.0	120	5.0		
21230	Cartilage graft, rib, au- togenous, to face, nose or ear (includes obtain- ing graft)	18.0	120	5.0		
21235	ear cartilage to nose or ear (includes obtain- ing graft)	12.0	60	5.0		
21240	Arthroplasty, temporo- mandibular joint, uni- lateral	BR+		5.0		
Fracture and/or Dislocation						
21300	Skull fracture, non-op- erative	Sv.&				
	(For operative repair, see 62000-62010)					
21310	Nasal fracture, closed or open, without reduc- tion	Sv.&				
*21315	closed reduction, uncomplicated (digital)	*1.1	0	3.0		
21320	complicated (in- strumental)	3.0	90	3.0		
21325	open reduction, un- complicated	4.0	90	3.0		
21330	complicated, with internal and/or external skeletal fixation	9.5	90	3.0		
21335	with concomitant open reduction of fractured septum	17.0	90	3.0		
21350	Malar area fracture (e.g., zygomatic arch, etc.), closed or open					
	without reduction				Sv.&	
*21355	closed reduction, zy- gomatic arch (e.g., towel clip technique)	*1.2	0	3.0		
21360	depressed, open re- duction	7.0	90	3.0		
21365	complicated, open re- duction with internal skeletal fixation and multiple surgical ap- proaches	13.0	90	3.0		
21380	Orbital floor fracture ("blow-out" type), closed or open, without reduction	Sv.&				
21385	open reduction, transantral (Caldwell-Luc) ap- proach	12.0	90	3.0		
21390	peri-orbital ap- proach, with allopl- lastic or other implant	14.0	90	3.0		
21395	with bone graft (includes obtain- ing graft)	18.0	90	3.0		
21429	Maxillary fracture, closed or open without reduction	Sv.&				
21425	closed reduction, with wiring of maxillary teeth	7.0	90	3.0		
	(For interdental wir- ing, see 21455)					
21430	open reduction, with wiring and/or local fixation	12.0	90	3.0		
21435	complicated, open re- duction, fixation by head cap, multiple surgical approaches, internal fixation, wir- ing teeth, etc.	BR+		5.0		
	(For antral approach, see 31020, 31021)					
21450	Mandibular fracture, closed or open, without reduction	Sv.&				
21455	closed reduction and interdental fixation . .	8.0	90	5.0		
21460	open reduction with or without interdental fixation	16.0	90	5.0		
21470	complicated, open re- duction, multiple sur- gical approaches,					

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
	internal fixation, interdental fixation, etc.	BR+		5.0
21480	Temporo-mandibular dislocation, with uncomplicated closed reduction, initial or subsequent	Sv.&		3.0
21485	complicated, closed reduction	BR+		3.0
21490	open reduction	BR+		3.0

[Order 74-7, § 296-22-042, filed 1/30/74.]

WAC 296-22-051 Neck (soft tissues) and thorax.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
	(For cervical spine, see 22100, et seq.)			
	(For injection of fracture site or trigger point, see 20550)			
	(For abdominal fascial transplant, see 22910)			
	(For repair of diaphragm, see 39500-39540)			

Incision

	(For simple incision and drainage, see 10060)			
21500	Incision and drainage of deep abscess requiring partial ostectomy of rib	6.0	30	3.0

Excision

	(For biopsy, see 20200, 20240)			
	(For excision of chest wall tumor involving ribs, e.g., radical excision, see 19260, 19270)			
21600	Excision of rib, partial, for benign tumor	6.0	60	5.0
21610	Costotransversectomy ..	BR+		5.0
21620	Partial ostectomy of sternum	BR+		5.0
21625	Partial excision of bone (craterization or saucerization) for osteomyelitis	BR+		5.0
21630	Radical resection of sternum for tumor	BR+		5.0

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
	Repair, Revision or Reconstruction			
	(For repair of deep wounds, see 20800)			
21700	Division of scalenus anticus, without resection of cervical rib	10.0	60	3.0
21705	with resection of cervical rib	12.0	60	5.0
21720	Division of sternocleidomastoid for torticollis, open operation	8.0	60	3.0
21725	with cast application	9.0	60	3.0
21740	Pectus excavatum or carinatum, plastic repair	26.0	120	11.0

Fracture and/or Dislocation

21800	Rib, fracture(s), closed, uncomplicated	Sv.&		
21805	open or complicated ..	BR+		5.0
21810	closed or open requiring external fixation ("flail chest")	BR+		5.0
21820	Sternum, fracture, closed (simple)	Sv.&		
21825	open or complex	BR+		5.0
	(For sternoclavicular dislocation, see 23520-23530)			

[Order 74-7, § 296-22-051, filed 1/30/74.]

WAC 296-22-053 Spine (vertebral column).

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
	(Cervical, thoracic (dorsal), and lumbar spine)			
	(For injection procedure for myelography, see 63510-63520)			
	(For injection procedure for discography, see 63530-63535)			
	Excision			
	(For biopsy, see 20220-20250)			
	(For discectomy without arthrodesis (excision of intervertebral disc), see 63400-63415)			

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
	(For laminectomy, Gill procedure, see 63010)				Values for procedures 22330-22370 are for a single level procedure; for additional levels, see 22730, 22735.				
22100	Partial resection of vertebral component, spinous processes (e.g., "kissing" spines)	8.0	90	Cervical 8.0 Other 7.0	22330	cervical spine, open reduction and fusion, posterior approach, with local bone graft and/or internal fixation	28.0	180	8.0
22105	for tumor (e.g., partial facetectomy without primary grafting)	12.0	90	Cervical 8.0 Other 7.0	22335	with iliac or other autogenous bone graft (includes obtaining graft)	31.0	180	8.0
22110	Partial excision of bone (craterization or saucerization), for osteomyelitis	BR+		Cervical 8.0 Other 7.0	22345	anterior approach, with iliac or other autogenous bone graft (includes obtaining graft)	30.0	180	7.0
22120	Radical resection of vertebral body or component with primary grafting, includes obtaining graft, cervical	BR+		8.0	22355	thoracic or lumbar spine, open reduction and fusion, posterior approach, local bone graft and/or internal fixation	26.0	180	7.0
22125	thoracic or lumbar	BR+		7.0	22360	with iliac or other autogenous bone graft (includes obtaining graft)	30.0	180	7.0
Repair, Reconstruction	Revision or				22370	posterolateral or anterolateral approach, with iliac or other autogenous bone graft (includes obtaining graft)	BR+		7.0
	(For repair of pseudarthrosis, see 22600-22735)				Manipulation				
22200	Osteotomy of lumbar spine for correction of fixed deformity, posterior approach	32.0	180	7.0	22500	Spine, any region, including office visit	0.3	0	
22205	anterior approach	40.0	180	7.0	*22505	requiring anesthesia	*1.4	0	3.0
Fracture and/or Dislocation					Arthrodesis				
22305	Vertebral process, fracture, one or more			Sv.&	Arthrodesis with Discectomy (inter-vertebral disc excision, laminotomy or laminectomy and fusion):				
22310	Vertebral body fracture and/or dislocation, one or more, without reduction or with treatment by traction, any level			Sv.&	Values for procedures 22550-22565 are for a single level procedure; for additional levels, see 22730, 22735.				
22315	manipulative reduction with anesthesia	7.0	180	3.0	(For discectomy without arthrodesis, see 63400-63415)				
22325	open reduction	24.0	180	7.0	22550	Cervical, posterior approach, local bone graft			

	Follow-				Follow-		
	Unit Value	up Days=	Basic Anes@		Unit Value	up Days=	Basic Anes@
22552	28.0	180	8.0				
22555	32.0	180	8.0	22655	28.0	180	7.0
22560	28.0	180	7.0	22670	32.0	180	7.0
22561	26.0	180	7.0	22680	32.0	180	7.0
22565	30.0	180	7.0	22700	BR+		11.0
	24.0	180	7.0		24.0	180	7.0
(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b and modifier -62.)				(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b and modifier -62.)			
Arthrodesis, Primary or Repair of Pseudarthrosis				22720			
Values for procedures 22600-22720 are for single level procedures; for additional levels, see 22730, 22735.				22730	30.0	180	7.0
22600	24.0	180	8.0	22735	6.0		
22605	28.0	180	8.0	22800	BR+		
22615	28.0	180	7.0	22805	29.0	180	7.0
22640	28.0	180	7.0	22840	BR+		7.0
22645	24.0	180	7.0		50.0	180	7.0
				[Order 74-7, § 296-22-053, filed 1/30/74.]			
				WAC 296-22-061 Abdomen.			
				Follow-			
				Unit up Basic			
				Value Days= Anes@			
				Repair, Revision or Reconstruction			

		Follow- Unit up Value Days=	Basic Anes@
22910	Abdominal fascial transplants, bilateral (Lowman type procedure) (includes obtaining fascia)	20.0 90	5.0

[Order 74-7, § 296-22-061, filed 1/30/74.]

WAC 296-22-063 Shoulder.

		Follow- Unit up Value Days=	Basic Anes@
	(Clavicle, scapula, humeral head and neck, sternoclavicular joint, acromioclavicular joint and shoulder joint.)		

Incision

23000	Removal of sub-deltoid (or intratendinous) calcareous deposits	6.0 60	3.0
	(For excision of sub-deltoid bursa, see 23110)		
23020	Capsular contracture release (Sever's type) for Erb's palsy	11.0 60	3.0
23040	Arthrotomy (capsulotomy) with exploration, drainage, or removal of foreign body	11.0 60	3.0

Excision

	(For biopsy, see 20200-20245)		
	(For sequestrectomy for osteomyelitis or bone abscess, see 20290)		
23100	Arthrotomy (capsulotomy) for biopsy	11.0 60	3.0
23105	for synovectomy	BR+	3.0
23110	Subacromial (sub-deltoid) bursa excision	6.0 60	3.0
23120	Claviclectomy, partial (e.g., Mumford type procedure)	8.5 60	3.0
23125	total	16.0 60	3.0
23130	Acromiectomy	8.5 60	3.0
23140	Excision of bone cyst or benign tumor of clavicle or scapula	6.0 60	3.0

		Follow- Unit up Value Days=	Basic Anes@
23145	with primary autogenous graft (includes obtaining graft)	9.0 120	3.0
23180	Partial excision of bone (craterization, saucerization or diaphysectomy) for osteomyelitis, clavicle	5.0 60	3.0
23190	Ostectomy of scapula, partial (e.g., superior medial angle)	7.0 60	3.0
23200	Radical resection for tumor of clavicle	BR+	3.0
23210	Radical resection for tumor of scapula	BR+	3.0

Introduction or Removal

(For arthrocentesis or needling of bursa, see 20610)

(For K wire or pin insertion or removal, see 20650, 20670, 20680.)

23300	Prosthesis removal from shoulder joint	11.0 60	3.0
23350	Injection procedure for shoulder arthrography	0.6 0	3.0

Repair, Revision or Reconstruction

(For neurorrhaphy or neuroplasty, 64700 et seq.)

(For repair of deep wound, see 20800)

(For sternoclavicular reconstruction, see 23530)

(For acromioclavicular joint reconstruction, see 23550)

23400	Scapulopexy (e.g., Sprengel's deformity or paralysis)	22.0 90	3.0
23410	Repair of ruptured supraspinatus tendon or musculotendinous cuff, acute	14.0 120	3.0
23420	Repair of complete shoulder cuff avulsion, chronic (includes acromiectomy)	18.0 120	3.0
23430	Tenodesis for rupture of long tendon of biceps	12.0 90	3.0

		Follow- Unit Value	up Days=	Basic Anes@			Follow- Unit Value	up Days=	Basic Anes@
23440	Resection or transplan- tation of long tendon of biceps, for chronic tenosynovitis	12.0	90	3.0	23570	Scapular fracture, closed, without reduc- tion	Sv.&		
23450	Capsulorrhaphy for re- current dislocation, an- terior (Putti-Platt or Magnusen type proce- dure)	17.0	90	3.0	23575	closed manipula- tive reduction (with or without shoulder joint in- volvement)	2.8	90	3.0
23455	(Bankart type proce- dure)	19.0	90	3.0	23585	closed or open, juxtaarticular, open reduction	12.0	90	3.0
23460	with bone block	20.0	120	3.0	23600	Surgical neck, fracture, closed, without reduc- tion	Sv.&		
23465	posterior, with or without bone block	17.0	90	3.0	23605	closed manipula- tive reduction	5.0	90	3.0
23470	Arthroplasty with pros- thesis (e.g., Neer type procedure)	20.0	120	3.0	23610	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	7.0	90	3.0
23480	Osteotomy, clavicle, with or without internal fixation	10.0	90	3.0	23615	closed or open, open reduction, with or without internal or external skeletal fixa- tion	12.0	90	3.0
23485	with bone graft for non-union or malunion (includes obtaining graft and/or necessary fix- ation)	13.0	120	3.0	23650	Shoulder dislocation, closed, closed manipu- lative reduction, with- out anesthesia	Sv.&		
Fracture and/or Dislocation					*23655	requiring anes- thesia	*1.2	0	3.0
23500	Clavicular fracture, closed, without reduc- tion	Sv.&			23660	closed or open, open reduction	12.0	90	3.0
23505	closed manipula- tive reduction	3.0	90	3.0	23665	with fracture of greater tuberosity, closed ma- nipulative reduction	3.0	90	3.0
23510	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	5.0	90	3.0	23670	closed or open, open reduction	12.0	90	3.0
23515	closed or open, open reduction, with or without internal or external skeletal fixa- tion	9.0	90	3.0	23675	with surgical or ana- tomical neck fracture, closed manipulative re- duction	4.0	90	3.0
23520	Sternoclavicular dislo- cation, closed, without reduction	Sv.&			23680	closed or open, open reduction	14.0	90	3.0
23525	closed manipulative reduction	2.8	90	3.0	Manipulation				
23530	closed or open, acute or chronic, open re- duction or repair	10.0	90	5.0	*23700	Manipulation under an- esthesia, including ap- plication of fixation apparatus (dislocation excluded)	*1.2	0	3.0
23540	Acromioclavicular dis- location, closed, without reduction	Sv.&			Arthrodesis				
23545	closed manipula- tive reduction	2.4	45	3.0	23800	Fusion of shoulder joint, with or without bone graft	20.0	120	3.0
23550	closed or open, acute or chronic, open re- duction	12.0	90	3.0					

		Follow- Unit up Value Days=	Basic Anes@
Amputation			
23900	Interthoracoscapular (fore-quarter)	24.0 90	11.0
23920	Disarticulation of shoulder	18.0 90	5.0

[Order 74-7, § 296-22-063, filed 1/30/74.]

WAC 296-22-067 Humerus (upper arm) and elbow.

		Follow- Unit up Value Days=	Basic Anes@
	(Elbow area includes head and neck of radius and olecranon process.)		
Incision			
24000	Arthrotomy (capsulotomy), elbow, with exploration, drainage, or removal of foreign body	10.0 60	3.0
Excision			
	(For muscle or bone biopsy, see 20200-20245)		
24100	Arthrotomy (capsulotomy), elbow, for biopsy	10.0 60	3.0
24102	for synovectomy	14.0 90	3.0
24105	Olecranon bursa excision	4.8 60	3.0
24110	Excision of bone cyst or benign tumor, humerus	9.5 60	3.0
24115	with primary autogenous graft (includes obtaining graft)	12.5 120	3.0
24120	head or neck of radius or olecranon process	8.0 60	3.0
24125	with primary autogenous graft (includes obtaining graft)	10.0 120	3.0
24130	Radial head excision	8.0 60	3.0
24140	Partial excision of bone (craterization, saucerization or diaphysectomy), for osteomyelitis, humerus, head or neck of radius or olecranon process	7.0 60	3.0
24150	Radical resection for tumor, shaft or distal part of humerus	BR+	3.0

Introduction or Removal

(For K wire or pin insertion or removal, see 20650, 20670, 20680)

(For arthrocentesis or needling of bursa or joint, see 20605)

Repair, Revision, and Reconstruction

(For neurorrhaphy or neuroplasty, arm, see 64700 et seq.)

(For repair of deep wound, see 20800)

24300	Muscle or tendon transfer, any type, for paralysis of upper arm or shoulder	BR+	3.0
24310	Tenotomy, open, elbow to shoulder, single	5.0 30	3.0
24320	Tenoplasty, transplantation or free graft, elbow to shoulder, single	BR+	3.0
24330	Flexor-plasty, elbow (e.g., Steindler type advancement)	8.0 90	3.0
24340	Tenodesis for rupture of biceps tendon at elbow	14.0 90	3.0
24350	Fasciotomy, lateral or medial (e.g., "tennis elbow" or epicondylitis)	6.0 30	3.0
24360	Arthroplasty, elbow, with or without prosthesis	BR+	
24400	Osteotomy, humerus, with or without internal fixation	12.0 90	3.0
24410	Multiple osteotomies with realignment on intramedullary rod (Sofield type procedure)	14.0 90	3.0
24420	Osteoplasty, humerus, shortening or lengthening	BR+	3.0
24430	Repair of non-union or malunion, humerus, without graft (e.g., compression technique, etc.)	17.0 90	3.0
24435	with iliac or other autogenous bone graft (includes obtaining graft)	20.0 120	3.0

		Follow-			Follow-		
		Unit	up	Basic	Unit	up	Basic
		Value	Days=	Anes@	Value	Days=	Anes@
	(For proximal radius and/or ulna, see 25400-25420)						
24470	Hemi-epiphyseal arrest (e.g., for cubitus varus or valgus, distal humerus)	7.0	120	3.0			
Fracture and/or Dislocation							
24500	Humeral shaft fracture, closed without reduction	Sv.&					
24505	closed manipulative reduction	5.0	90	3.0			
24510	open, with uncomplicated soft tissue closure, manipulative reduction	7.0	90	3.0			
24515	closed or open, open reduction, with or without internal or external skeletal fixation	11.0	90	3.0			
24530	Supracondylar or transcondylar fracture, closed, without reduction	Sv.&					
24535	closed manipulative reduction	5.0	90	3.0			
24540	open, with uncomplicated soft tissue closure, manipulative reduction	7.0	90	3.0			
24545	closed or open, open reduction, with or without internal or external skeletal fixation	10.0	90	3.0			
24560	Epicondylar fracture, medial or lateral condyle, closed, without reduction	Sv.&					
24565	closed manipulative reduction	4.0	90	3.0			
24570	open, with uncomplicated soft tissue closure, manipulative reduction	6.0	90	3.0			
24575	closed or open, open reduction, with or without internal or external skeletal fixation	9.0	90	3.0			
24600	Elbow dislocation, closed, manipulative reduction, without anesthesia	Sv.&					
					*24605	requiring anesthesia	*1.0 0 3.0
					24610	open, with uncomplicated soft tissue closure, manipulative reduction	6.0 45 3.0
					24615	closed or open, open reduction	12.0 90 3.0
					24620	Monteggia type of fracture dislocation at elbow (fracture proximal end of ulna with dislocation of radial head), closed manipulative reduction	4.0 90 3.0
					24625	open, with uncomplicated soft tissue closure	6.0 90 3.0
					24635	closed or open, open reduction, with or without internal or external skeletal fixation	12.0 90 3.0
					24640	Radial head subluxation in child, "nursemaid elbow," manipulative reduction	Sv.&
					24650	Radial head or neck fracture, closed, without reduction	Sv.&
					24655	closed manipulative reduction	3.0 90 3.0
					24660	open, with uncomplicated soft tissue closure, manipulative reduction	4.0 90 3.0
					24665	closed, or open, open reduction, with or without internal fixation or radial head excision	8.0 90 3.0
					24670	Ulnar fracture, proximal end (olecranon process), closed without reduction	Sv.&
					24675	closed manipulative reduction	3.0 90 3.0
					24680	open, with uncomplicated soft tissue closure, manipulative reduction	4.0 90 3.0
					24685	closed or open, open reduction, with or without internal or external skeletal fixation	8.0 90 3.0

Surgical Fees

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		Follow- Unit up Value Days=	Basic Anes@
Manipulation			
*24700 Manipulation of joint under general anesthesia (includes application of traction or other fixation device	*1.0	0	3.0
Arthrodesis			
24800 Fusion of elbow, with or without bone graft	16.0	120	3.0
Amputation			
24900 Arm through humerus, closed	10.0	90	3.0
24920 open, flap or circular (guillotine)	9.0	90	3.0
24925 secondary closure or scar revision	3.0	30	3.0
24930 re-amputation	10.0	90	3.0
24940 Cineplasty, upper extremity, complete procedure	BR+		3.0

[Order 74-7, § 296-22-067, filed 1/30/74.]

WAC 296-22-071 Forearm and wrist.

	Follow- Unit up Value Days=	Basic Anes@	
(Radius, ulna, carpal bones and joints)			
Incision			
25000 Tenovagotomy at radial styloid for De Quervain's disease	4.4	30	3.0
25010 Arthrotomy (capsulotomy) with exploration, drainage, or removal of loose or foreign body, radiocarpal or intercarpal joint	5.0	60	3.0
(For decompression, median nerve (carpal tunnel syndrome), see 64930)			
Excision			
(For biopsy, see 20200-20240)			
25100 Arthrotomy (capsulotomy), radiocarpal or intercarpal joint, for biopsy	5.0	60	3.0
25105 for synovectomy	8.0	90	3.0

	Follow- Unit up Value Days=	Basic Anes@	
25110 Excision of lesion of tendon, sheath or capsule (e.g., cyst or ganglion, etc.), superficial	3.0	30	3.0
25111 deep, capsular	5.0	30	3.0
25115 Radical excision of bursa of hand, wrist or forearm (i.e., tenosynovitis, fungus, Tbc., or other granulomas)	10.0	60	3.0
25118 Synovectomy, flexor or extensor tendon sheaths, wrist	10.0	60	3.0
25120 Excision of bone cyst or benign tumor of radius or ulna (excluding head or neck of radius and olecranon process)	7.0	60	3.0
(For head or neck of radius or olecranon process, see 24120, 24125)			
25125 with primary autogenous graft (includes obtaining graft)	10.0	120	3.0
25130 Excision of bone cyst or benign tumor of carpal bones	5.0	60	3.0
25135 with primary autogenous graft (includes obtaining graft)	7.0	120	3.0
25150 Partial excision of bone (craterization, saucerization or diaphysectomy) for osteomyelitis, radius or ulna (excluding radial head or neck and olecranon process)	5.0	60	3.0
(For head or neck of radius or olecranon process, see 24120, 24125)			
25170 Radical resection for tumor, radius or ulna . .	BR+		3.0
25210 Carpectomy, one bone . .	7.0	60	3.0
25215 all bones or proximal row	10.0	60	3.0
25230 Radial Styloidectomy . .	5.0	60	3.0
25240 Excision distal ulna (Darrach type procedure)	6.0	60	3.0

		Follow-			Follow-		
		Unit	up	Basic	Unit	up	Basic
		Value	Days=	Anes@	Value	Days=	Anes@
Introduction or Removal							
	(For K wire, pin or rod insertion or removal, see 20650, 20670, 20680)				25440	23.0	120 3.0
Repair, Revision or Reconstruction							
	(For repair of deep wounds, see 20800)				25450	14.0	120 3.0
	(For neurorrhaphy or neuroplasty, see 64700 et seq.)				25455	6.0	120 3.0
	(For tenotomy or tenoplasty, see 24310, 24320)				25455	8.0	120 3.0
25300	Tenodesis, wrist	8.0	90	3.0	Fracture and/or Dislocation		
25310	Tendon transplantation or transfer, single	9.5	90	3.0	25500		
25311	multiple	12.0	90	3.0	25505		
25320	Capsulorrhaphy, or reconstruction (includes synovectomy, resection of capsule, tendon insertions, etc.)	BR+		3.0	25510		
25330	Arthroplasty, wrist	8.0	120	3.0	25515		
25350	Osteotomy, radius, distal third	10.0	90	3.0	25530		
25355	middle or proximal third	12.0	90	3.0	25535		
25360	ulna	10.0	90	3.0	25540		
25365	radius and ulna	14.0	90	3.0	25545		
25370	Multiple osteotomies, with realignment on intramedullary rod (Sofield type procedure), radius or ulna	12.0	90	3.0	25550		
25375	radius and ulna	18.0	90	3.0	25555		
25380	Osteoplasty, radius or ulna, shortening or lengthening	BR+		3.0	25560		
25400	Repair of non-union or malunion, radius or ulna, without graft (e.g., compression technique, etc.)	14.0	90	3.0	25565		
25405	with iliac or other autogenous bone graft (includes obtaining graft)	17.0	120	3.0	25570		
25415	radius and ulna, with or without graft (e.g., compression technique, etc.)	20.0	90	3.0	25575		
25420	with iliac or other autogenous bone graft (includes obtaining graft)						

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
25600	Distal radial fracture (e.g., Colles' type) with or without fracture of ulnar styloid, closed, without reduction								
					autogenous bone graft (includes obtaining graft)	16.0	120	3.0	
25605	closed manipulative reduction	4.0	90	3.0	Amputation				
25610	closed, complex, requiring manipulative reduction, with or without internal or external skeletal fixation	6.0	90	3.0	25900	Forearm, through radius and ulna, closed	9.0	90	3.0
25615	open, with uncomplicated soft tissue closure, manipulative reduction	5.0	90	3.0	25905	open, flap or circular (guillotine)	8.0	90	3.0
25620	closed or open, open reduction, with or without internal or external skeletal fixation	8.0	90	3.0	25907	secondary, closure or scar revision	3.0	30	3.0
25630	Carpal bone fracture(s), closed, without reduction				25909	re-amputation	9.0	90	3.0
25635	closed manipulative reduction	4.0	90	3.0	25920	Disarticulation through wrist	8.0	90	3.0
25640	open, with uncomplicated soft tissue closure, manipulative reduction	5.0	90	3.0	[Order 74-7, § 296-22-071, filed 1/30/74.]				
25645	closed or open, open reduction	6.0	90	3.0	WAC 296-22-073 Hand and fingers.				
*25660	Radio-carpal, radio-ulnar or intercarpal dislocation, closed, one or more bones, closed manipulative reduction	*1.2	0	3.0	Follow- Unit up Basic Value Days= Anes@				
25665	open, with uncomplicated soft tissue closure	4.0	45	3.0	Incision				
25670	closed or open, open reduction	8.0	90	3.0	(For drainage of paronychia, see 10100, 10101)				
25680	Trans-scapho-perilunar type of fracture dislocation, closed closed manipulative reduction	6.0	45	3.0	*26010	Drainage of finger tip abscess, simple	*0.72	0	3.0
25685	closed or open, open reduction	12.0	90	3.0	26011	complicated (e.g., felon), requiring general or regional anesthesia BR+			3.0
Manipulation					26020	Drainage of tendon sheath, acute suppurative tenosynovitis, one digit and/or palm	4.0	30	3.0
*25700	Manipulation of wrist joint under general anesthesia	*1.0	0	3.0	(For drainage of simple abscess, see 10020, 10060)				
Arthrodesis					26025	single palmar bursa, ulnar or radial	5.0	30	3.0
25800	Fusion of wrist, without bone graft	12.0	120	3.0	26030	multiple or complicated	BR+		3.0
25810	with iliac or other				26040	Fasciotomy, palmar, subcutaneous (for Dupuytren's contraction)	3.6	60	3.0
					26045	open	5.0	60	3.0
					(For fasciectomy, see 26120-26126)				
					*26060	Tenotomy, subcutaneous, single	*1.2	0	3.0
					*26061	additional digits, each	*0.4	0	3.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
26070	Arthrotomy (capsulotomy) with exploration, drainage or removal of loose or foreign body, carpo-metacarpal joint	5.0	60	3.0	(For trigger finger, see 26430)				
26075	metacarpophalangeal joint	5.0	60	3.0	26170	Excision of tendon, palm, flexor, single (independent procedure)	BR+		3.0
26080	interphalangeal joint.	4.0	60	3.0	26171	multiple	BR+		3.0
Excision					26180	finger	BR+		3.0
(For finger nail, see 11700-11750)					26200	Excision or curettage of bone cyst or benign tumor of metacarpal	6.0	60	3.0
(For biopsy, see 20200-20240)					26205	with autogenous graft (includes obtaining graft)	7.0	120	3.0
(For neuroma, see 64200-64210)					26210	proximal, middle or distal phalanx	5.0	60	3.0
26100	Arthrotomy for synovial biopsy, carpo-metacarpal joint	5.0	60	3.0	26215	with autogenous graft (includes obtaining graft)	6.0	120	3.0
26105	metacarpophalangeal joint	5.0	60	3.0	26230	Partial excision of bone (craterization, saucerization, or diaphysectomy) for osteomyelitis, metacarpal	6.0	60	3.0
26110	interphalangeal joint.	4.0	60	3.0	26235	proximal, middle or distal phalanx	5.0	60	3.0
26120	Fasciectomy, partial excision, simple (e.g., local nodule or single band), of palmar fascia (for Dupuytren's contracture), palm and/or finger	6.0	60	3.0	26250	Radical resection (osteotomy) for tumor, metacarpal, with or without autogenous graft	12.0	120	3.0
26122	up to 1/2 palmar fascia including vertical bands and digital extensions	10.0	60	3.0	26260	proximal, middle or distal phalanx, with autogenous graft (includes obtaining graft)	10.0	120	3.0
26125	complete	14.0	90	3.0	Introduction or Removal				
26126	including digital extensions	18.0	90	3.0	(For arthrocentesis (injection or aspiration) see 20600)				
(For skin grafts, etc., see 14000-15240)					(For K wire or pin insertion or removal, see 20650, 20670, 20680)				
26130	Synovectomy, carpo-metacarpal joint	10.0	90	3.0	Repair, Revision or Reconstruction				
26135	metacarpophalangeal joint	5.0	90	3.0	(For neurorrhaphy, neuroplasty or neurolysis, see 64700 et seq.)				
26140	interphalangeal joint	5.0	90	3.0	26400	Flexor tendon repair or advancement, single, primary	7.0	120	3.0
26145	tendon sheath, radical (tenosynovectomy), flexor, palm or finger, single	10.0	90	3.0	26402	secondary with or without free tendon graft (includes obtaining graft)	BR+		3.0
26150	extensors at wrist	BR+		3.0					
26160	Excision of lesion of tendon sheath or capsule (e.g., cyst or ganglion, etc.)	2.4	30	3.0					

Surgical Fees

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		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
26404	each additional tendon	1.8			26480	Tendon transfer or transplant, carpo-metacarpal area of dorsum of hand, single	8.0	90	3.0
26406	secondary, with or without free graft (includes obtaining graft)	BR+		3.0	26481	multiple	10.0	90	3.0
26410	extensor, dorsum of hand, single, primary	3.0	120	3.0	26483	with free tendon graft (includes obtaining graft)	11.0	90	3.0
26412	secondary, with or without free graft (includes obtaining graft)	BR+		3.0	26485	palmar, single	10.0	90	3.0
26414	each additional tendon	1.0			26487	multiple	12.0	90	3.0
26416	secondary, with or without free graft (includes obtaining graft)	BR+		3.0	26489	with free tendon graft (includes obtaining graft)	11.0	90	3.0
26418	dorsum of finger, single	4.0	120	3.0	26490	Opponens plasty, sublimis tendon transfer type (e.g., Krukenberg, Roeren, Ney, Royle type procedures)	9.5	120	3.0
26420	secondary, with or without free graft (includes obtaining graft)	BR+		3.0	26492	tendon transfer with graft (e.g., Bunnell, Camitz type procedures) (includes obtaining graft)	11.0	120	3.0
26422	each additional tendon	1.2			26494	muscle transfer (e.g., Huber, Nicolaysen, Littler type procedures)	12.0	120	3.0
26424	secondary, with or without free graft (includes obtaining graft)	BR+		3.0	26496	other methods (see also 26489)	BR+		3.0
26430	Tenovagotomy, for trigger finger	5.0	30	3.0	26500	Tendon pulley reconstruction with local tissues (independent procedure)	6.0	90	3.0
26440	Tenolysis, simple, flexor tendon, palm, single	5.0	60	3.0	26502	with tendon or fascial graft (includes obtaining graft)	8.0	90	3.0
26441	multiple, through same incision	6.0	60	3.0	26504	silastic tendon or rod technique	BR+		3.0
26445	finger, single	6.0	60	3.0	26510	Tenotomy and/or tenodesis and/or capsulotomy or capsulorrhaphy, with or without division of lateral slips at proximal interphalangeal joint, for finger deformity (swanneck, etc.)	BR+		3.0
26446	multiple	BR+		3.0	26512	boutonniere deformity	BR+		3.0
	(For fascia or other implant, see 20920, 20922)				26520	Capsulectomy or capsuloplasty for contracture, metacarpophalangeal joint, single	7.0	90	3.0
26450	Tenotomy, flexor, open, palm, single	4.0	30	3.0	26521	multiple	BR+		3.0
26451	multiple, through same incision	6.0	30	3.0	26525	interphalangeal joint, single	7.0	90	3.0
26455	finger, single	5.0	30	3.0	26526	multiple	BR+		3.0
26456	multiple	BR+		3.0					
26460	extensor	BR+		3.0					
26470	Tenodesis for joint stabilization metacarpophalangeal joint	8.0	120	3.0					
26475	interphalangeal joint	7.0	120	3.0					

		Follow- Unit up Value Days=	Basic Anes@			Follow- Unit up Value Days=	Basic Anes@
26530	Arthroplasty, metacarpo-phalangeal joint, single	7.0	90	3.0	26630	open, with uncomplicated soft tissue closure, manipulative reduction	3.6 90 3.0
26531	with prosthetic implant	9.0	90	3.0	26635	closed, or open, open reduction with or without internal or external skeletal fixation . .	BR+ 3.0
26533	multiple, with or without prosthetic implant	BR+		3.0	26640	Carpometacarpal dislocation, thumb (Bennett fracture), closed, without reduction	Sv.&
26535	interphalangeal joint, single	8.0	90	3.0	26645	closed manipulative reduction . .	4.0 45 3.0
26536	with prosthetic implant	BR+		3.0	26650	with skeletal fixation	6.0 45 3.0
26538	multiple, with or without prosthetic implant	BR+		3.0	26655	open, with uncomplicated soft tissue closure, manipulative reduction	5.0 45 3.0
26540	Reconstruction, collateral ligament, metacarpo-phalangeal joint, thumb	10.0	90	3.0	26660	with skeletal fixation	7.0 45 3.0
26545	interphalangeal joint, single	8.0	90	3.0	26665	closed or open, open reduction, with or without internal or external skeletal fixation	10.0 90 3.0
26550	Pollicization of a digit .	BR+		3.0	*26670	other carpo-metacarpal dislocation, closed, single, closed manipulative reduction, without anesthesia	*0.72 0
26555	positional change of other finger	BR+		3.0	26675	requiring anesthesia	2.0 45 3.0
26560	Repair of syndactyly (web finger), with skin flaps	9.5	45	3.0	26680	open, with uncomplicated soft tissue closure, manipulative reduction	3.0 45 3.0
26561	with skin flaps and grafts	12.5	45	3.0	26685	closed or open, open reduction, with or without internal or external skeletal fixation . .	6.0 90 3.0
26562	complex, involving bone, nails, etc.	BR+		3.0	*26700	Metacarpo-phalangeal dislocation, closed, single, closed manipulative reduction, without anesthesia	*0.72 0
26565	Osteotomy for correction of deformity, metacarpal	8.0	90	3.0	26705	requiring anesthesia	2.0 45 3.0
26567	phalanx	5.0	90	3.0	26710	open, with uncomplicated soft tissue closure, manipulative reduction	3.0 45 3.0
26570	Bone graft, metacarpal (includes obtaining graft)	10.0	120	3.0			
26574	phalanx	7.0	120	3.0			
Fractures and/or Dislocation							
26600	Metacarpal fracture, single, closed, without reduction	Sv.&					
26605	closed manipulative reduction . .	2.4	90	3.0			
26610	open, with uncomplicated soft tissue closure, manipulative reduction	3.0	90	3.0			
26615	closed or open, open reduction, with or without internal or external skeletal fixation . .	7.0	90	3.0			
26620	multiple, closed, without reduction . .	Sv.&					
*26625	closed manipulative reduction . .	*3.0	90	3.0			

Surgical Fees

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		Follow-				Follow-			
		Unit Value	up Days=	Basic Anes@		Unit Value	up Days=	Basic Anes@	
26715	closed or open, open reduction, with or without internal or external skeletal fixation	6.0	90	3.0	26850	Metacarpo-phalangeal joint, with or without internal fixation	7.0	120	3.0
26720	Phalanges, fracture, proximal or middle, finger, or thumb, closed, without reduction	Sv.&			26852	with autogenous graft (includes obtaining graft)	8.0	120	3.0
26725	closed manipulative reduction . .	1.6	45	3.0	26860	Interphalangeal joint, with or without internal fixation	5.0	120	3.0
26730	open, with uncomplicated soft tissue closure, manipulative reduction	2.2	45	3.0	26862	with autogenous graft (includes obtaining graft)	6.0	120	3.0
26735	closed or open, open reduction, with or without internal or external skeletal fixation . .	4.0	60	3.0	Amputation				
26750	distal phalanx, finger or thumb, closed, without reduction . .	Sv.&			26900	Hand through metacarpal bones	10.0	90	3.0
*26755	closed manipulative reduction . .	*0.72	0	3.0	26910	Metacarpal, with finger or thumb, single	7.0	90	3.0
26760	open, with uncomplicated soft tissue closure, manipulative reduction	1.2	30	3.0		(For repositioning, see 26550-26555)			
26765	closed or open, open reduction, with or without internal or external skeletal fixation . .	2.4	45	3.0	26950	Finger, any joint or phalanx, single	3.0	45	3.0
*26770	Interphalangeal joint dislocation, single, closed, manipulative reduction without anesthesia	*0.72	0			(For skin grafts or flap closure, see 15050-15770)			
26775	requiring anesthesia	1.2	45	3.0		(For repair of soft tissue defects requiring split, full thickness, neurovascular or other pedicle grafts, see 15100-15770)			
26780	open, with uncomplicated soft tissue closure, manipulative reduction	1.6	45	3.0	[Order 74-7, § 296-22-073, filed 1/30/74.]				
26785	closed or open, open reduction with or without internal or external skeletal fixation	2.4	60	3.0	WAC 296-22-079 Pelvis and hip joint (including head and neck of femur).				
Arthrodesis					Follow-				
26840	Carpo-metacarpal joint, with or without internal fixation	8.0	120	3.0	Unit up Basic Value Days= Anes@				
26842	with autogenous graft (includes obtaining graft)	10.0	120	3.0	Incision				
					(For perineal abscess, see 45020, 46050, 46060)				
					*27000	Tenotomy, adductor, subcutaneous, closed (independent procedure)	*1.0	0	3.0
					27001	open	3.0	45	3.0
					27005	iliopsoas, open (independent procedure) . .	6.0	45	3.0
					27010	Gluteal-iliotibial fasciotomy (Ober type procedure)	6.0	45	3.0

	Follow-				Follow-		
	Unit Value	up Days=	Basic Anes@		Unit Value	up Days=	Basic Anes@
27015 Iliac crest fasciotomy (Soutter or Campbell type procedure), stripping of ilium	8.0	90	3.0				
27025 Ober-Yount fasciotomy, combined with spica cast, pins in tibia, wedging the cast, etc., unilateral	10.0	90	3.0	27080 Coccygectomy	6.0	90	3.0
27026 bilateral	12.0	90	3.0	Introduction and/or Removal			
27030 Arthrotomy (capsulotomy), hip, with exploration, drainage or removal of loose or foreign body	14.0	90	3.0	(For arthrocentesis or needling of bursa, see 20610)			
27035 Hip joint denervation, intrapelvic or extrapelvic	17.0	60	3.0	(For wire or pin insertion, see 20650)			
27036 intra- and extrapelvic	22.0	60	3.0	27090 Removal of hip prosthesis (independent procedure)	14.0	90	3.0
(For obturator neurectomy, see 64080, 64085)				Repair, Revision or Reconstruction			
Excision				(For abdominal fascial transplant, bilateral (Lowman type procedure), see 22910)			
(For biopsy, see 20200-20245)				(For repair of deep wound, see 20800)			
27050 Arthrotomy (capsulotomy), for biopsy, sacroiliac joint	6.0	90	3.0	27100 Transfer external oblique muscle to greater trochanter	15.0	120	5.0
27052 hip joint	14.0	90	3.0	27105 Transfer paraspinal muscle to hip (includes fascial or tendon graft)	16.0	120	3.0
27054 for synovectomy	20.0	90	3.0	27110 Transfer iliopsoas to greater trochanter	18.0	120	3.0
27060 Excision of ischial bursa	5.0	60	3.0	27115 Muscle release, complete, (hanging hip operation)	BR+		5.0
27062 trochanteric bursa or calcification	4.0	60	3.0	27120 Hip reconstruction (Whittman or Colona type procedure)	24.0	120	6.0
27065 Excision of bone cyst or benign tumor, superficial (e.g., wing or ilium, symphysis pubis or greater trochanter of femur), with or without autogenous bone chips	5.0	120	3.0	27122 (Girdlestone type procedure)	20.0	120	7.0
27066 deep	9.5	120	3.0	27125 Arthroplasty, cup or prosthesis	28.0	180	7.0
27070 Partial excision of bone (craterization, saucerization or diaphysectomy), for osteomyelitis, superficial (e.g., wing of ilium, symphysis pubis or greater trochanter of femur)	6.0	60	3.0	27127 with acetabuloplasty	34.0	180	7.0
27071 deep	12.0	60	3.0	27130 acetabular and proximal femoral prosthetic replacement (total hip)	40.0	180	7.0
27075 Radical resection for tumor	BR+		5.0	27135 secondary reconstruction or revision	BR+		7.0
(For amputation, either interpelviabdominal or				27140 Osteotomy and transference of greater trochanter (independent procedure)	12.0	90	3.0
				27145 Osteotomy, iliac or acetabular (Pemberton or Salter type procedure), under age 6			

Surgical Fees

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		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
	years	19.0	120	4.0	27214	closed or open, open			
27146	age 6 or over . . .	24.0	120	5.0		reduction, with or			
27150	with femoral					without internal or			
	osteotomy, under age					external skeletal fixa-			
	6 years	24.0	120	4.0		tion	BR+		4.0
27151	age 6 or over . . .	27.0	120	5.0	27220	Acetabulum (hip sock-			
27155	with open reduc-					et), fracture(s), closed,			
	tion of hip, under					without reduction	Sv.&		
	age 6 years	27.0	120	4.0	27222	closed manipula-			
27156	age 6 or over . . .	30.0	120	5.0		tive reduction with			
27160	Osteotomy, femoral					or without skeletal			
	neck, under age 8 years					traction	8.0	90	3.0
	(independent proce-				27224	closed or open, open			
	dures)	14.0	120	3.0		reduction, with or			
27161	age 8 or over	20.0	120	3.0		without internal or			
27165	Osteotomy, inter-					external skeletal fixa-			
	subtrochanteric includ-					tion	22.0	90	5.0
	ing internal or external				27230	Femur, fracture, proxi-			
	fixation and/or cast . . .	24.0	120	5.0		mal end, neck, closed,			
27170	Bone graft for non-					without reduction	Sv.&		
	union, femoral head, neck				27232	closed manipula-			
	or subtrochanteric area					tive reduction,			
	(includes obtaining					including skele-			
	graft)	24.0	120	6.0		tal traction	9.5	90	3.0
27175	Slipped femoral				27234	open, with uncom-			
	epiphysis, no reduction,					plicated soft tissue			
	treatment by traction . .	Sv.&				closure, manipula-			
27177	open reduction, single					tive reduction (in-			
	or multiple pinning or					cluding skeletal			
	bone graft (includes					traction)	12.0	90	3.0
	obtaining graft)	22.0	120	5.0	27236	closed or open,			
27179	osteoplasty of femoral					open reduction, in-			
	neck (Hayman type					ternal fixation or			
	procedure)	16.0	120	5.0		prosthetic replace-			
27181	osteotomy and inter-					ment	22.0	120	6.0
	nal fixation	24.0	120	5.0	27238	intertrochanteric or			
27185	Epiphyseal arrest by					peretrochanteric,			
	epiphysiodesis or					closed, without re-			
	stapling, greater tro-					duction	Sv.&		
	chanter	5.0	120	3.0	27240	closed manipula-			
						tive reduction			
						(including skele-			
						tal traction)	9.5	90	3.0
Fractures and/or Dislocations					27242	open with uncom-			
27190	Sacrum, fracture,					plicated soft tissue			
	closed, without reduc-					closure manipula-			
	tion	Sv.&				tive reduction (in-			
27192	closed or open, open					cluding skeletal			
	reduction	BR+		3.0		traction)	12.0	90	3.0
27195	Sacro-iliac and/or sym-				27244	closed or open,			
	physis pubis dislocation					open reduction,			
		Sv.&				with internal fixa-			
27200	Coccyx, fracture	Sv.&				tion	20.0	120	6.0
27210	Iliac, pubic and/or				27246	greater trochanter,			
	ischial fracture(s),					closed without reduc-			
	closed, without reduc-					tion	Sv.&		
	tion	Sv.&							
27212	open, with uncompli-				27248	closed or open,			
	cated soft tissue clo-					open reduction,			
	sure, manipulative								
	reduction	Sv.&		3.0					

		Follow-			WAC 296-22-082 Femur (thigh region) and knee joint (includes tibial plateaus).			Follow-		
		Unit Value	up Days=	Basic Anes@				Unit Value	up Days=	Basic Anes@
27250	Hip dislocation, traumatic, closed, closed manipulative reduction, without anesthesia ...	7.0	90	5.0	Incision					
27252	requiring anesthesia ...	4.8	120	3.0	27300	Tenotomy, subcutaneous (closed), adductor or hamstring, single (independent procedure) ...	2.4	45	3.0	
27254	closed or open, open reduction with or without internal or external skeletal fixation ...	17.0	120	5.0	27302	adductor and hamstrings (independent procedure) ...	3.0	45	3.0	
27256	congenital, adduction splint or traction, in any form ...					(For open tenotomy, see 27390, 27392)				
27257	closed reduction requiring anesthesia ...	4.5	45	3.0	27305	Ilio-tibial fasciotomy (tenotomy), open ...	6.0	45	3.0	
27258	open reduction and replacement of femoral head in acetabulum (including tenotomy).	17.0	120	5.0		(For combined Ober-Yount fasciotomy, see 27025)				
Manipulation					27310	Arthrotomy (capsulotomy), knee, with exploration, drainage or removal of foreign body ...	12.0	90	3.0	
27270	Sacro-iliac joint, without anesthesia, including office visit ...	0.3	0		27315	Hamstring muscle neurectomy ...	11.0	30	3.0	
*27272	requiring general anesthesia ...	*1.2	0	3.0	27320	Popliteal (gastrocnemius) neurectomy ...	11.0	30	3.0	
*27275	Hip joint, requiring general anesthesia ...	*1.2	0	3.0	Excision					
Arthrodesis						(For biopsy, see 20200-20245)				
27280	Sacro-iliac joint (includes obtaining graft).	14.0	120	5.0	27330	Arthrotomy (capsulotomy), knee for biopsy ...	12.0	90	3.0	
27282	Symphysis pubis (includes obtaining graft).	BR+		4.0	27332	for excision of semilunar cartilage (meniscectomy) ...	14.0	90	3.0	
27284	Fusion of hip joint (includes obtaining graft).	24.0	180	5.0	27334	for synovectomy ...	17.0	120	3.0	
27286	with subtrochanteric osteotomy ...	26.0	180	5.0	27340	Excision, prepatellar bursa ...	5.0	60	3.0	
Amputation					27345	Excision of synovial cyst of popliteal space (Baker's cyst) ...	8.0	60	3.0	
27290	Interpelviabdominal amputation (hind quarter amputation) ...	29.0	120	11.0	27350	Patellectomy or hemipatellectomy ...	12.0	90	3.0	
27295	Disarticulation of hip ..	24.0	120	8.0	27355	Excision of bone cyst or benign tumor of femur .	11.0	60	3.0	
[Order 74-7, § 296-22-079, filed 1/30/74.]					27357	with primary autogenous graft (includes obtaining graft) ...	14.0	120	3.0	
					27360	Partial excision of bone (craterization, saucerization or				

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				Follow-					Follow-				
				Unit	up	Basic					Unit	up	Basic
				Value	Days=	Anes@					Value	Days=	Anes@
		diaphysectomy), for osteomyelitis, femur, proximal tibia and/or fibula	10.0	60	3.0		27412	secondary repair, collateral or cruciate ligament	19.0	120	3.0		
27365		Radical resection for tumor	BR+		3.0		27413	medial ligament and capsule (Slocum type procedure)	19.0	120	3.0		
Introduction or Removal													
(For arthrocentesis or needling of bursa or joint, see 20610)													
(For removal of Rush pin, intramedullary rod, etc., see 20680)													
27370		Injection procedure for knee arthrography	0.6	0			27414	collateral and cruciate ligaments.	23.0	120	3.0		
27375		Arthroscopy of knee (independent procedure) with or without biopsy	5.4				27420	Reconstruction for recurrent dislocating patella (Hauser type procedure)	15.0	120	3.0		
(When performed in conjunction with arthrotomy, see Modifier -50)													
Repair, Revision or Reconstruction													
(For repair of deep wound, see 20800)													
27380		Suture of infrapatellar tendon	11.0	90	3.0		27422	with extensor realignment and/or muscle advancement or release (Campbell, Goldthwaite, etc., type procedure)	15.0	120	3.0		
27385		Suture of quadriceps muscle rupture	13.0	90	3.0		27424	with patellectomy	17.0	120	3.0		
27390		Tenotomy, open adductor or hamstring, knee to hip, single	6.0	45	3.0		27430	Quadricepsplasty (Thompson type procedure)	15.0	120	3.0		
27392		adductor and hamstring(s)	8.0	45	3.0		27435	Capsulotomy, knee, posterior capsular release	14.0	90	3.0		
(For subcutaneous tenotomy, see 27300, 27302)													
27395		Transplant of hamstring tendon(s) to patella	16.0	120	3.0		27440	Arthroplasty, knee, femoral condyle or tibial plateau	20.0	120	3.0		
27400		Tendon or muscle transfer, hamstrings to femur (Egger type procedure)	16.0	120	3.0		27442	femoral condyles or tibial plateaus	24.0	120	3.0		
27405		Suture, primary, torn, ruptured or severed ligament, with or without meniscectomy, knee, collateral	14.0	120	3.0		27444	total, fascial or prosthetic, medial or lateral compartment	28.0	120	3.0		
27407		cruciate	16.0	120	3.0		27447	medial and lateral compartments	40.0	120	3.0		
27409		collateral and cruciate	18.0	120	3.0		27450	Osteotomy, femur, shaft or supracondylar	19.0	90	3.0		
(For subcutaneous tenotomy, see 27300, 27302)													
							27452	multiple with realignment on intramedullary rod (Sofield type procedure)	20.0	90	3.0		
							27455	proximal tibia, including fibular excision or osteotomy (includes correction of genu varus (bowleg) or genu valgus (knock knee), unilateral, under age 8 years	12.0	90	3.0		
							27456	age 8 or over	14.0	90	3.0		
							27460	bilateral, under age 8 years	18.0	90	3.0		
							27461	age 8 or over	21.0	90	3.0		
							27465	Osteoplasty, femur, shortening	20.0	180	3.0		

		Follow-				Follow-			
		Unit	up	Basic		Unit	up	Basic	
		Value	Days=	Anes@		Value	Days=	Anes@	
27466	lengthening	26.0	180	3.0					
27468	combined, lengthening and shortening with femoral segment transfer	40.0	180	4.0	27520	external skeletal fixation	20.0	90	3.0
27470	Repair, nonunion or malunion, femur, distal to head and neck, without graft (e.g., compression technic, etc.)	20.0	120	3.0	27522	Patella, fracture, closed, without reduction	Sv.&		
27472	with iliac or other autogenous bone graft (includes obtaining graft)	23.0	120	3.0	27524	open, with uncomplicated soft tissue closure	4.0	90	3.0
27475	Epiphyseal arrest by epiphysiodesis or stapling, distal femur	14.0	120	3.0	27524	closed or open, open reduction, with repair and/or excision	12.0	90	3.0
27477	tibia and fibula, proximal	16.0	120	3.0	27530	Tibia, fracture, proximal (plateau), closed without reduction	Sv.&		
27479	combined, distal femur and proximal tibia and fibula (knee) (see also 27740, 27742)	20.0	120	3.0	27532	closed manipulative reduction	5.0	90	3.0
27485	Hemi-epiphyseal arrest, distal femur or proximal leg (e.g., for genu varus or valgus)	11.0	120	3.0	27534	open, with uncomplicated soft tissue closure, manipulative reduction	8.0	90	3.0
Fractures and/or Dislocation					27536	closed or open, open reduction, with or without internal or external skeletal fixation	14.0	90	3.0
27500	Femur, shaft fracture (including supracondylar), closed, without reduction	Sv.&			27538	intercondylar, spine(s), closed without reduction	Sv.&		
27502	closed manipulative reduction	7.0	90	3.0	27540	closed or open, open reduction and internal fixation	14.0	90	3.0
27504	open, with uncomplicated soft tissue closure, manipulative reduction	11.0	90	3.0	27550	Knee dislocation, closed, closed manipulative reduction, without anesthesia	Sv.&		
27506	closed, or open, open reduction, with or without internal or external skeletal fixation	19.0	90	3.0	27552	requiring anesthesia	3.6	45	3.0
27508	distal end, medial or lateral condyle, closed, without reduction	Sv.&			27554	open, with uncomplicated soft tissue closure, manipulative reduction	7.0	45	3.0
27510	Closed manipulative reduction	8.0	90	3.0	27556	closed or open, open reduction, with or without internal or external skeletal fixation	15.0	90	3.0
27512	open, with uncomplicated soft tissue closure, manipulative reduction	12.0	90	3.0	27560	Patellar dislocation, closed, closed manipulative reduction, without anesthesia	Sv.&		
27514	closed or open, open reduction, with or without internal or				27562	requiring anesthesia	3.6	45	3.0
					27564	open, with uncomplicated soft tissue closure, manipulative reduction	5.0	45	3.0
					27566	closed or open, open reduction with or			

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		Follow- Unit up Value Days=	Basic Anes@
	without partial or total patellectomy	12.0	90 3.0
Manipulation			
*27570	Manipulation of knee joint under general anesthesia (includes application of traction or other fixation devices) .	*1.2	0 3.0
Arthrodesis			
27580	Fusion of knee	20.0	120 3.0
Amputation			
27590	Thigh, through femur, any level, closed	14.5	120 4.0
27592	open, flap or circular (guillotine)	14.0	120 4.0
27594	secondary closure or scar revision	Sv.& BR+	3.0 4.0
27596	re-amputation	BR+	4.0
27598	Disarticulation at knee .	14.0	120 4.0

[Order 76-34, § 296-22-082, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-22-082, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-22-082, filed 1/30/74.]

WAC 296-22-087 Leg (tibia and fibula) and ankle.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
27600	Fasciotomy, leg, anterior compartment, for closed spaced decompression	5.0	30 3.0
27602	including posterior compartment decompression	7.0	30 3.0
27605	Tenotomy, Achilles tendon, subcutaneous (independent procedure) . .	1.0	0 3.0
27610	Arthrotomy (capsulotomy), ankle, with exploration, drainage or removal of loose or foreign body	9.0	60 3.0
27612	posterior capsular release, with or without Achilles tendon lengthening (see also 27685)	10.0	60 3.0

Excision
(For biopsy, see 20200-20245)

		Follow- Unit up Value Days=	Basic Anes@
27620	Arthrotomy (capsulotomy), ankle, for biopsy	9.0	60 3.0
27625	for synovectomy	12.0	90 3.0
27630	Excision of lesion of tendon, sheath or capsule (e.g., cyst or ganglion, etc.)	3.6	30 3.0
27635	Excision of bone cyst or benign tumor, tibia or fibula	10.0	60 3.0
27637	with primary autogenous graft (includes obtaining graft)	13.0	120 3.0
27640	Partial excision of bone, (craterization, saucerization or diaphysectomy) for osteomyelitis, tibia and/or fibula	12.0	60 3.0
27645	Radical resection for tumor	BR+	3.0

Introduction and/or Removal

(For arthrocentesis or needling of bursa or joint, see 20605)

(For removal of Rush pin, intramedullary rod, Lottes nail, etc., see 20680)

Repair, Revision or Reconstruction

(For repair of deep wound, see 20800)

27650	Suture of ruptured Achilles tendon	11.0	120 3.0
27652	with graft	14.0	120 3.0
27655	Repair of fascial defect of leg	6.0	45 3.0
27660	Repair of suture of tendon, primary, leg, flexor, single	6.0	90 3.0
27662	secondary with or without free graft	8.0	90 3.0
27664	each additional tendon	1.0	
27666	secondary with or without free graft	2.0	
27668	extensor, single	4.0	90 3.0
27670	secondary with or without free graft	6.0	90 3.0

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
27672	each additional tendon	1.0			27732	stapling, distal tibia . . .	12.0	120 3.0
27674	secondary with or without free graft	2.0			27734	distal fibula	6.0	120 3.0
27680	Tenolysis, open single	5.0	60	3.0	27740	distal tibia and fibula	14.0	120 3.0
27681	multiple (through same inci-					combined, proximal and distal tibia and fibula	18.0	120 3.0
	*[See Reviser's note.]				27742	and distal femur	22.0	120 3.0
27685	Lengthening or shortening of tendon (e.g., Achilles tendon) (see also 27605, 27612)	7.0	90	3.0		(For epiphyseal arrest of proximal tibia and fibula, see 27477, 27479)		
27690	Transfer or transplant of tendon (with muscle redirection or rerouting), single, superficial	8.0	120	3.0	Fractures and/or dislocations			
27691	each additional tendon	2.0			27750	Tibia, shaft, fracture, closed, without reduction	Sv.&	
27693	through interosseous space	10.0	120	3.0	27752	closed manipulative reduction	5.0	90 3.0
27695	Suture, primary, torn, ruptured or severed ligament, ankle, collateral	10.0	120	3.0	27754	open, with uncomplicated soft tissue closure, manipulative reduction	6.5	90 3.0
27696	both collateral ligaments	14.0	120	3.0	27756	closed or open, open reduction, with internal or external skeletal fixation	12.0	90 3.0
27698	secondary repair, collateral ligament	14.0	120	3.0	27760	distal extremity (medial malleolus) closed, without reduction	Sv.&	
27700	Arthroplasty, ankle	BR+		3.0	27762	closed manipulative reduction	3.0	90 3.0
27705	Osteotomy, tibia	12.0	90	3.0	27764	open, with uncomplicated soft tissue closure, manipulative reduction	4.4	90 3.0
27707	fibula	7.0	90	3.0	27766	closed or open, open reduction and fixation	9.0	90 3.0
27709	tibia and fibula	14.0	90	3.0	27780	Fibula, fracture, proximal extremity or shaft, closed, without reduction	Sv.&	
27712	multiple, with realignment on intramedullary rod (Sofield type procedure)	18.0	90	3.0	27782	open, with uncomplicated soft tissue closure, manipulative reduction	4.0	90 3.0
	(For osteotomy to correct genu varus (bowleg) or genu valgus (knock-knee), see 27455-27461)				27784	closed or open, open reduction, with or without internal or external skeletal fixation	8.0	90 3.0
27715	Osteoplasty, tibia and fibula, lengthening	24.0	90	3.0	27786	distal extremity (lateral malleolus) closed, without reduction	Sv.&	
27720	Repair of non-union or malunion, tibia, without graft (e.g., compression technic, etc.)	18.0	90	3.0				
27722	with sliding graft, local bone	20.0	120	3.0				
27724	with iliac or other autogenous bone graft (includes obtaining graft)	22.0	120	3.0				
27730	Epiphyseal arrest by epiphysiodesis or							

Surgical Fees

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		Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
27788	closed manipulative reduction ..	3.0	90	3.0	27840	Ankle dislocation, closed, manipulative reduction without anesthesia		
27790	open, with uncomplicated soft tissue closure, manipulative reduction	4.0	90	3.0	*27842	requiring anesthesia	Sv.& *2.0	45 3.0
27792	closed or open, open reduction, with fixation	9.0	90	3.0	27844	open, with uncomplicated soft tissue closure, manipulative reduction	3.2	45 3.0
27800	Tibia and fibula, fractures, shafts, closed, without reduction	Sv.&			27846	closed or open, open reduction	12.0	90 3.0
27802	closed manipulative reduction ..	6.5	90	3.0	27848	Distal tibio-fibular joint dislocation (ankle mortise), closed or open, open reduction and fixation	9.0	90 3.0
27804	open, with uncomplicated soft tissue closure, manipulative reduction	8.0	90	3.0				
27806	closed or open, open reduction, with or without internal or external skeletal fixation ..	14.5	90	3.0	Manipulation			
27808	bi-malleolar fracture, ankle (including Potts), closed, without reduction	Sv.&			*27860	Manipulation of ankle under general anesthesia (includes application of traction or other fixation apparatus)	*1.0	0 3.0
27810	closed manipulative reduction ..	5.0	90	3.0	Arthrodesis			
27812	open, with uncomplicated soft tissue closure, manipulative reduction	6.5	90	3.0	27870	Fusion, ankle	17.0	120 3.0
27814	closed or open, open reduction, with or without internal or external skeletal fixation ..	12.0	90	3.0	Amputation			
27816	trimalleolar, closed, without reduction ...	Sv.&			27880	Leg, through tibia and fibula, closed	12.0	90 4.0
27818	closed manipulative reduction ..	6.0	90	3.0	27882	open, flap or circular (guillotine)	10.5	90 4.0
27820	open, with uncomplicated soft tissue closure, manipulative reduction	7.0	90	3.0	*27884	secondary closure or scar revision	*Sv.& BR+	3.0 4.0
27822	closed or open, open reduction, with or without internal or external skeletal fixation ..	14.5	90	3.0	27886	re-amputation		
27830	Proximal tibio-fibular joint dislocation, closed, manipulative reduction without anesthesia	Sv.&			27888	Ankle, through malleoli of tibia and fibula (Syme, Pirogoff type procedure), with plastic closure and resection of nerves	12.0	90 3.0
27832	open reduction and fixation or excision ..	8.0	90	3.0				

[Order 74-7, § 296-22-087, filed 1/30/74.]

Reviser's note: Entry 27681 was incomplete when filed in the office of the Code Reviser.

WAC 296-22-091 Foot.

	Unit Value	Follow-up Days=	Basic Anes@
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Incision

28000	Fasciotomy, plantar and/or toe, subcutaneous (see also 28060, 28062, 28250)	2.4	60	3.0
*28010	Tenotomy, subcutaneous, toe, single	*0.8	0	3.0

		Follow-					Follow-			
		Unit	up	Basic			Unit	up	Basic	
		Value	Days=	Anes@			Value	Days=	Anes@	
*28011	multiple	*1.2	0	3.0	28106	with iliac or other autogenous bone graft (includes obtaining graft)	5.6	120	3.0	
	(For open tenotomy, see 28230, 28234)				28108	Phalanges	3.6	60	3.0	
28020	Arthrotomy (capsulotomy), with exploration, drainage or removal of loose or foreign body, intertarsal or tarsometatarsal joint . .	6.0	60	3.0		(For ostectomy, partial (e.g., hallux valgus, Silver type procedure) see 28290)				
28022	metatarsophalangeal joint	3.6	60	3.0	28110	Ostectomy, partial excision of fifth metatarsal head (bunionette) (independent procedure) .	2.4	60	3.0	
28024	interphalangeal joint.	2.4	60	3.0	28112	metatarsal head, single	4.0	60	3.0	
28030	Neurectomy of intrinsic musculature of foot . .	BR+		3.0	28114	all metatarsal heads with partial proximal phalangectomies (Clayton type procedure)	12.0	60	3.0	
Excision	(For toenail, see 11730-11750)					28116	excision of tarsal coalition	7.0	60	3.0
	(For biopsy, see 20200-20240)				28118	os calcis, partial (Cotton scoop type procedure)	7.0	60	3.0	
28050	Arthrotomy for synovial biopsy, intertarsal or tarsometatarsal joint . .	6.0	60	3.0	28120	Partial excision of bone (craterization, saucerization or diaphysectomy) for osteomyelitis, astragalus or os calcis	6.0	60	3.0	
28052	metatarsophalangeal joint	3.6	60	3.0	28122	other tarsal or metatarsal bone	4.8	60	3.0	
28054	interphalangeal joint.	2.4	60	3.0	28124	phalanx	3.6	60	3.0	
28060	Faciectomy, excision of plantar fascia, partial (independent procedure)	6.0	60	3.0	28130	Astragalectomy	10.0	120	3.0	
28062	radical (independent procedure)	BR+		3.0	28140	Metatarsectomy	6.0	60	3.0	
	(For plantar fasciotomy, see 28000, 28250)				28150	Phalangectomy, single .	3.6	30	3.0	
28070	Synovectomy, intertarsal or tarsometatarsal joint . .	6.0	90	3.0	28151	multiple	4.8	30	3.0	
28072	metatarsophalangeal joint	3.6	90	3.0	28160	Hemiphalangectomy or interphalangeal joint excision, single	3.0	30	3.0	
28080	Excision of Morton's neuroma, single	3.6	30	3.0	28161	multiple	4.2	30	3.0	
28090	Excision of lesion of tendon or fibrous sheath or capsule (cyst or ganglion, etc.), foot .	3.6	30	3.0	28170	Radical resection for tumor	BR+		3.0	
28092	toes	2.4	30	3.0		Introduction and/or Removal				
28100	Excision of bone cyst or benign tumor, astragalus or os calcis	6.0	60	3.0		(For arthrocenteses (injections or aspiration), see 20600, 20605)				
28102	with iliac or other autogenous bone graft (includes obtaining graft)	7.0	120	3.0		(For K wire or pin insertion or removal, see 20650, 20670)				
28104	other tarsal or metatarsal bones	4.8	60	3.0		Repair, Revision or Reconstruction				

Surgical Fees

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		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
28200	Repair or suture of tendon, primary or secondary, foot, flexor, single .	6.0	90	3.0	28264	mid-tarsal (Heyman type procedure)	12.0	90	3.0
28202	with free graft (includes obtaining graft)	8.0	90	3.0	28270	Capsulotomy for contracture, metatarsophalangeal joint, with or without tenorrhaphy (independent procedure)	3.0	60	3.0
28204	each additional tendon	1.0			28272	interphalangeal joint, (independent procedure)	1.4	60	3.0
28206	with free graft (includes obtaining graft)	2.0			28280	Webbing operation (create syndactylism of toes) for soft corn (Kelikian type procedure)	3.6	46	3.0
28208	extensor, single	2.8	90	3.0	28285	Hammer toe operation, one toe (e.g., interphalangeal fusion, filleting, phalangectomy)	4.8	90	3.0
28210	with free graft (includes obtaining graft)	4.4	90	3.0	28290	Hallux valgus, correction by exostectomy (Silver type procedure)	4.8	60	3.0
28212	each additional tendon	0.8			28292	(Keller, McBride or Mayo type procedure)	7.0	90	3.0
28214	with free graft (includes obtaining graft)	1.2			28294	with tendon transplants (Joplin type procedure)	9.5	90	3.0
28220	Tenolysis, flexor, single	5.0	60	3.0	28296	with metatarsal osteotomy (Mitchell or Lapidus type procedure)	9.5	120	3.0
28222	multiple (through same incision)	6.0	60	3.0	28300	Osteotomy, including internal fixation, os calcis (Dwyer or Chambers type procedure)	9.5	90	3.0
28225	extensor, single	2.8	60	3.0	28302	astragalus	9.0	90	3.0
28226	multiple (through same incision)	3.6	60	3.0	28304	other mid-tarsal bones	8.0	90	3.0
28230	Tenotomy, open, flexor, foot, single or multiple (independent procedure)	3.0	30	3.0	28306	metatarsals, base or shaft, single, for shortening or angular correction, first metatarsal	7.0	90	3.0
28232	toe, single (independent procedure)	1.4	30	3.0	28308	other metatarsals	5.6	90	3.0
28234	extensor, foot or toe	1.0	30	3.0	28310	proximal phalanx, first toe, for shortening, angular or rotational correction (independent procedure)	2.8	90	3.0
	(For subcutaneous tenotomy, see 28010, 28011)				28312	other phalanges, any toe.	2.0	90	3.0
	(For extensor hallucis longus transfer, great toe, and fusion, see 28760)				28320	Repair of non-union or malunion tarsal bones (os calcis, astragalus, etc.)	BR+		3.0
	(For transfer or transplant of tendon with muscle redirection or rerouting, see 27690-27693)								
28240	Tenotomy or release, abductor hallucis muscle (McCauley type procedure)	3.6	60	3.0					
28250	Division of plantar fascia and muscle ("Steindler stripping").	6.0	60	3.0					
28260	Capsulotomy, midfoot (medial release)	BR+		3.0					
28262	with tendon lengthening	BR+		3.0					

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
28322	metatarsal, with or without bone graft (includes obtaining graft).....	4.8	120	3.0					
Fracture and/or Dislocation									
28400	Os calcis, fracture, closed without reduction	Sv.&			28475	without reduction	Sv.&		
28405	closed manipulative reduction, including Cotton or Bohler type reductions	BR+		3.0	28480	closed manipulative reduction	2.2	90	3.0
28410	open, with uncomplicated soft tissue closure, manipulative reduction	4.0	90	3.0	28485	open, with uncomplicated soft tissue closure, manipulative reduction	3.0	90	3.0
28415	closed or open, open reduction, with or without internal or external skeletal fixation	10.0	90	3.0	28490	closed or open, open reduction, with or without internal or external skeletal fixation	6.0	90	3.0
28420	with primary iliac or other autogenous bone graft (includes obtaining graft)	14.5	90	3.0	28495	Phalanx or phalanges, fracture great toe, closed, without reduction	Sv.&		
28430	Astragalus, fracture, closed, without reduction	Sv.&			28495	closed manipulative reduction ..	1.2	30	3.0
28435	closed manipulative reduction	3.0	90	3.0	28500	open, with uncomplicated soft tissue closure, manipulative reduction	1.8	30	3.0
28440	open, with uncomplicated soft tissue closure, manipulative reduction	4.0	90	3.0	28505	closed or open, open reduction, with or without internal or external skeletal fixation ..	3.6	45	3.0
28445	closed or open, open reduction, with or without internal or external skeletal fixation	10.0	90	3.0	28510	other than great toe, without reduction ...	Sv.&		
28450	Tarsal bone(s) (except astragalus and os calcis), fracture(s), closed, without reduction	Sv.&			28515	closed manipulative reduction ..	1.0	30	3.0
28455	closed manipulative reduction	2.0	90	3.0	28520	open, with uncomplicated soft tissue closure, manipulative reduction	1.6	30	3.0
28460	open, with uncomplicated soft tissue closure, manipulative reduction	3.0	90	3.0	28525	closed or open, open reduction, with or without internal or external skeletal fixation ..	3.0	45	3.0
28465	closed or open, open reduction, with or without internal or external skeletal fixation	6.0	90	3.0	*28540	Tarsal bone, dislocation, closed, manipulative reduction without anesthesia	*0.72	0	
28470	Metatarsal(s), fracture(s), closed,				28545	requiring anesthesia	2.0	45	3.0
					28550	open, with uncomplicated soft tissue closure, manipulative reduction	2.8	45	3.0
					28555	closed or open, open reduction, with or without internal or external skeletal fixation	6.0	90	3.0
					*28570	Astragalo-tarsal joint, dislocation, closed, manipulative reduction			

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
	without anesthesia	*1.0	0					
28575	requiring anesthe- sia	2.4	45	3.0	Arthrodesis			
28580	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	3.2	45	3.0	28700	Pantalar arthrodesis, under age 14 years	16.0	120 3.0
28585	closed or open, open reduction, with or without internal or external skeletal fixa- tion	10.0	90	3.0	28705	age 14 or over	19.0	120 3.0
*28600	Tarso-metatarsal joint, dislocation, closed, ma- nipulative reduction without anesthesia	*0.72	0		28710	Triple arthrodesis, under age 14 years	12.0	120 3.0
28605	requiring anesthe- sia	2.0	45	3.0	28715	age 14 or over	15.0	120 3.0
28610	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	2.8	45	3.0	28720	Subastragalar arthrode- sis (includes Grice type procedure), under age 14 years	10.0	120 3.0
28615	closed or open, open reduction, with or without internal or external skeletal fixa- tion	6.0	90	3.0	28725	age 14 or over	12.0	120 3.0
*28630	Metatarsal-phalangeal joint, dislocation, closed manipulative reduction without anesthesia	*0.72	0		28730	Midtarsal or tarso- metatarsal arthrodesis, multiple or transverse .	11.0	120 3.0
28635	requiring anesthe- sia	1.4	45	3.0	28735	with osteotomy as for flat foot correc- tion	14.0	120 3.0
28640	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	2.0	45	3.0	28740	single joint	9.0	120 3.0
28645	closed or open, open reduction, with or without internal or external skeletal fixa- tion	4.0	90	3.0	28750	Great toe metatarso- phalangeal joint	7.0	120 3.0
*28660	Interphalangeal joint, dislocation, closed, ma- nipulative reduction without anesthesia	*0.72	0		28755	interphalangeal joint.	4.0	120 3.0
28665	requiring anesthe- sia	1.2	45	3.0	28760	with redirection of attachment of extensor hallucis longus (Jones type procedure)	6.0	120 3.0
28670	open, with uncompl- icated soft tissue clo- sure, manipulative reduction	1.6	45	3.0		(For hammer toe opera- tion or interphalangeal fusion, see 28285)		
28675	closed or open, open reduction, with or without internal or external skeletal fixa- tion	2.4	60	3.0	Amputation			
					28800	Foot, midtarsal (Chopart type proce- dure)	10.0	90 3.0
					28805	transmetatarsal	10.0	90 3.0
					28810	Metatarsal, with toe, single	6.0	90 3.0
					28820	Toe, metatarso- phalangeal joint	3.0	45 3.0
					28825	interphalangeal joint.	2.0	45 3.0
						(For skin grafts and flaps, see 15050-15770)		
						[Order 74-7, § 296-22-091, filed 1/30/74.]		
						WAC 296-22-095 Casting and strapping.		
						The listed values apply when the cast application or strapping is part of a service (Sv.) procedure or is a re- placement during or after the period of follow-up care. Additional visit charges are warranted only if significant identifiable further services are provided at the time of the cast application or strapping.		

Listed values include removal of cast or strapping.

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
					age 10 years	1.8	2	3.0
					age 10 or over	2.4	2	3.0
Body and Upper Extremity					29340 Long leg cast (thigh to toes), under age 10 years	0.8	2	3.0
Casts					29345 age 10 or over	1.1	2	3.0
29000 Halo type fixation and body cast	5.0	2	3.0	29350 walking or ambulatory type, under age 10 years	1.0	2	3.0	
29010 Risser jacket, localizer, body only	3.0	2	3.0	29355 age 10 or over	1.3	2	3.0	
29015 including head	3.6	2	3.0	29360 Cylinder cast (thigh to ankle), under age 10 years	0.8	2	3.0	
29020 Turnbuckle jacket, body only	3.0	2	3.0	29365 age 10 or over	1.0	2	3.0	
29025 including head	3.6	2	3.0	29400 Short leg (below knee to toes), under age 10 years	0.5	2	3.0	
29035 Body, shoulder to hips .	1.6	2	3.0	29405 age 10 or over	0.8	2	3.0	
29040 including head, Minerva type	2.2	2	3.0	29420 walking or ambulatory type, under age 10 years	0.6	2	3.0	
29044 including one thigh	2.0	2	3.0	29425 age 10 or over	1.0	2	3.0	
29046 including both thighs	2.2	2	3.0	29440 Adding walker to previ- ously applied cast, any age	0.3			
29050 Shoulder spica, under age 10 years	1.2	2	3.0	29450 Clubfoot cast with molding or manipula- tion, long or short leg, under age 24 months, single	0.4	2	3.0	
29055 age 10 or over	1.8	2	3.0	29455 bilateral	0.8	2	3.0	
29060 Shoulder to hand (long arm), under age 10 years	0.6	2	3.0					
29065 age 10 or over	0.8	2	3.0	(If over age 24 months, see other lower extremi- ty casts)				
29070 Elbow to fingers (short arm), under age 10 years	0.4	2	3.0	Splints				
29075 age 10 or over	0.6	2	3.0	29500 Long leg (thigh to ankle or toes), under age 10 years	0.6	2	3.0	
29080 Hand and lower fore- arm (gauntlet), under age 10 years	0.4	2	3.0	29505 age 10 or over	0.72	2	3.0	
29085 age 10 or over	0.6	2	3.0	29510 Short leg (calf to foot), under age 10 years	0.4	2	3.0	
Splints				29515 age 10 or over	0.6	2	3.0	
29100 Long arm (shoulder to hand), under age 10 years	0.5	2	3.0	Strapping—any age				
29105 age 10 or over	0.6	2	3.0	29200 Thorax	0.4	0		
29120 Short arm (forearm and hand), under age 10 years	0.4	2	3.0	29220 Low back	0.5	0		
29125 age 10 or over	0.5	2	3.0	29240 Shoulder (e.g., Velpeau)	0.6	0		
Strapping—any age				29260 Elbow or wrist	0.24	0		
29200 Thorax	0.4	0		Lower Extremity				
29220 Low back	0.5	0		Casts				
29240 Shoulder (e.g., Velpeau)	0.6	0		29300 Hip spica, unilateral, under age 10 years	1.4	2	3.0	
29260 Elbow or wrist	0.24	0		29305 age 10 or over	2.0	2	3.0	
Lower Extremity				29320 bilateral, or one and one-half spica, under				
Casts								
29300 Hip spica, unilateral, under age 10 years	1.4	2	3.0	Removal or Repair				
29305 age 10 or over	2.0	2	3.0	(Listed values for re- moval pertain only to cast applied by another physician)				
29320 bilateral, or one and one-half spica, under				29700 Removal or bivalving, gauntlet, boot, body,				

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		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
29710	full arm or full leg cast shoulder or hip spica, Minerva, or Risser jacket, etc.....	0.4	0					
29715	turnbuckle jacket ...	0.5	0					
29720	Repair of spica, body cast or jacket	0.7	0					
29730	Windowing of cast	0.24	0					
29740	Wedging of cast (except clubfoot casts).....	0.24	0					
29750	Wedging clubfoot cast, unilateral	0.3	0					
29751	bilateral	0.3	0					
		0.4	0					

[Order 74-7, § 296-22-095, filed 1/30/74.]

RESPIRATORY SYSTEM

WAC 296-22-100 Nose.

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
Incision	(For simple furuncle see 10020)							
*30000	Drainage of intranasal abscess or hematoma of lateral cartilage	*1.2	0	3.0	30400	Rhinoplasty, lateral and alar cartilages and/or elevation of nasal tip ..	12.0	180 3.0
*30020	Drainage of septal abscess or hematoma	*1.4	0	3.0	30410	complete, external parts including bony pyramid, lateral and alar cartilages, and/or elevation of nasal tip.....	18.0	180 3.0
Excision	(For excision of nasopharyngeal fibroma, see 42880)				30420	including major septal repair	20.0	180 3.0
	(For biopsy of nasopharynx, see 42804)				30430	secondary minor revision, established patient	3.0	45 3.0
30100	Biopsy, soft tissue, nose	0.6	7	3.0	30440	new patient	10.0	45 3.0
30110	Excision of nasal polyp(s), one or more, unilateral or bilateral, one or more stages, office	1.4	15	3.0		(For total or major partial reconstruction, see 13000-15760, 21210-21235)		
30115	complicated, requiring hospitalization ..	4.0	30	3.0		(For nasal bridge collapse, bone or cartilage graft or alloplastic implant, see 21210-21235)		
30120	Excision or surgical planing of skin of nose for rhinophyma.....	10.0	60	3.0	30500	Submucous resection, classic, nasal septum, with or without cartilage implant	8.0	90 3.0
30130	Excision hypertrophic mucosa, turbinate	2.0	30	3.0	30520	Septoplasty (independent procedure)	10.0	90 3.0
30140	Resection of inferior turbinate (submucous),				30540	Repair, choanal atresia, intranasal	11.0	60 3.0
					30545	transpalatine	20.0	365 3.0
					*30560	Lysis of synechia	*0.4	0 3.0
					30580	Repair of oromaxillary fistula	10.0	90 3.0

		Follow- Unit Value	up Days=	Basic Anes@
30585	with radical antrotomy	14.0	90	3.0
30600	Repair of oronasal fistula	BR+		3.0
30620	Reconstruction, functional, of the internal nose (septal dermatoplasty)	10.0	90	3.0

Destruction

*30800	Cauterization of turbinates, superficial, unilateral or bilateral (independent procedure)	*0.4	0	3.0
30805	intramural	1.4	7	3.0

Manipulation

(For reduction of fracture, see 21310-21335)

*30900	Nasal hemorrhage, anterior, control of, unilateral or bilateral, with or without cauterization or anterior packs	*0.6	0	
*30905	posterior, with posterior nasal packs, with or without cauterization and/or anterior pack, initial	*2.4	0	3.0
*30906	subsequent	*1.6	0	3.0
30910	by ligation of anterior ethmoidal or external carotid artery	10.0	30	3.0

[Order 74-7, § 296-22-100, filed 1/30/74; Order 68-7, § 296-22-100, filed 11/27/68, effective 1/1/69.]

WAC 296-22-105 Accessory sinuses.

		Follow- Unit Value	up Days=	Basic Anes@
Incision				
*31000	Antrum lavage, puncture or natural ostium, unilateral	*0.4	0	3.0
*31001	bilateral	*0.6	0	3.0
31020	Antrotomy, intranasal, unilateral	3.0	90	3.0
31021	bilateral	6.0	90	3.0
31030	radical (Caldwell-Luc), unilateral	12.0	90	3.0
31031	bilateral	16.0	90	3.0
31050	Sphenoid sinusotomy	11.0	30	3.0
31070	Frontal sinusotomy, external, simple (trephine			

		Follow- Unit Value	up Days=	Basic Anes@
31075	operation) transorbital, unilateral (Lynch) (mucocele or osteoma)	10.0	30	3.0
31080	radical, obliterative	16.0	180	3.0
31090	Combined external frontal, ethmoidal and sphenoidal sinusotomy, unilateral	24.0	180	3.0
		26.0	180	3.0

Excision

31200	Ethmoidectomy, unilateral, intranasal	6.0	90	3.0
31205	extranasal	13.0	90	3.0
31220	Maxillectomy, unilateral, with or without orbital exenteration and/or lateral rhinotomy	24.0	180	3.0

(For hypophysectomy, transeptal, see 61665)

[Order 74-7, § 296-22-105, filed 1/30/74; Order 68-7, § 296-22-105, filed 11/27/68, effective 1/1/69.]

WAC 296-22-110 Larynx.

		Follow- Unit Value	up Days=	Basic Anes@
Excision				
31300	Laryngofissure with removal of tumor or laryngocele (cordectomy)	16.0	90	6.0
31320	Thyrotomy, diagnostic	8.0	60	6.0
31325	for laryngeal web, two stage, with Keel insertion and removal (McNaught type)	16.0	180	6.0
31330	for laryngeal stenosis with graft or core mold, including tracheotomy	16.0	90	6.0
31360	Laryngectomy, without neck dissection	26.0	180	6.0
31365	with radical neck dissection	34.0	180	6.0
31370	Hemilaryngectomy, horizontal	30.0	180	6.0
31375	lateral-vertical	20.0	180	6.0
31380	anterio-vertical	20.0	180	6.0
31400	Arytenoidectomy or arytenoidopexy, external approach (see also 31560)	20.0	180	6.0
31420	Epiglottidectomy, external approach	16.0	180	6.0

	Follow- Unit up Value Days=	Basic Anes@
Introduction		
(For injection procedure for bronchography, see 31655, 31710)		
31500 Endotracheal intubation, emergency procedure.....	1.4	0

	Follow- Unit up Value Days=	Basic Anes@
Endoscopy		
(For biopsy or pharynx, nasopharynx, hypopharynx, see 42800-42804)		
31510 Laryngoscopy, indirect, with biopsy	1.4	7
31515 direct, for aspiration (independent procedure)	0.6	0
31520 diagnostic, newborn (independent procedure)	2.4	7
31525 except newborn .	4.0	7
31530 operative, including foreign body removal	6.0	30
31535 with biopsy	6.0	30
31540 including excision of tumor and/or stripping of vocal cords or epiglottis	6.0	90
31545 with Lynch suspension	6.0	90
31560 Endoscopic arytenoidectomy, with or without tracheostomy	15.0	90
31570 Injection of vocal cord(s) (e.g., teflon)...	6.0	90

	Follow- Unit up Value Days=	Basic Anes@
Repair		
31590 Laryngoplasty (including acute fracture)	BR+	6.0

[Order 74-7, § 296-22-110, filed 1/30/74; Order 68-7, § 296-22-110, filed 11/27/68, effective 1/1/69.]

WAC 296-22-115 Trachea and bronchi.

	Follow- Unit up Value Days=	Basic Anes@
Incision		
31600 Tracheostomy (independent procedure), over age 2 years	5.4	15
31610 Tracheal fenestration with skin flaps	7.0	15

	Follow- Unit up Value Days=	Basic Anes@
Endoscopy		
31620 Bronchoscopy, diagnostic.....	3.6	30
31625 with biopsy	5.0	30
31630 with tracheal dilation or closed reduction of fracture of tracheal ring(s)	6.0	30
31635 with removal of foreign body.....	5.6	30
31640 with excision of tumor	5.0	30
31645 with therapeutic aspiration of tracheo-bronchial tree, initial	4.0	30
31646 subsequent.....	2.6	30
31650 with drainage of lung abscess or cavity, initial	4.0	30
31651 subsequent.....	2.6	30
31655 with injection of contrast medium for bronchography	4.0	30

	Follow- Unit up Value Days=	Basic Anes@
Introduction		
(For tracheal aspiration (independent procedure) under direct vision, see 31515)		
31700 Catheterization for bronchspirometry (independent procedure)..	3.6	0
31710 Injection procedure for bronchography (independent procedure) (see also 31655)	0.8	0

	Follow- Unit up Value Days=	Basic Anes@
Repair		
31750 Tracheoplasty: plastic operation on trachea, cervical	BR+	6.0
31755 Asai technique for vocal rehabilitation of laryngectomized patient	BR+	6.0
31760 intrathoracic	BR+	12.0
31770 Bronchoplasty, graft repair	BR+	11.0
31775 excision of stenosis and anastomosis	BR+	11.0

(For lobectomy and bronchoplasty, see 32485)

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Suture				
31800	Tracheorrhaphy: suture of external tracheal wound or injury, cervical	BR+		6.0
31805	intrathracic	BR+		12.0
31820	Closure of tracheostomy or tracheal fistula		4.0 30	4.0
31825	with plastic repair		6.0 30	4.0

(For repair of tracheo-esophageal fistula, see 43305-43310)

[Order 74-7, § 296-22-115, filed 1/30/74; Order 68-7, § 296-22-115, filed 11/27/68, effective 1/1/69.]

WAC 296-22-116 Lungs and pleura.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Incision				
*32000	Thoracentesis: puncture of pleural cavity for aspiration, initial or subsequent	*0.72	0	
*32020	Tube thoracostomy with water seal, pneumothorax, simple	*1.2	0	
32025	complicated, in surgery	3.0	30	3.0
32030	for drainage of empyema	6.0	60	3.0
32100	Thoracotomy, exploratory, including biopsy.	12.0	90	11.0
32110	with control of hemorrhage and/or repair of lung fistula	16.0	90	11.0
32120	for post-operative complications	16.0	90	11.0
32130	with open drainage of empyema cavity by rib resection (independent procedure)	10.0	90	11.0
32140	with cyst(s) removal	16.0	90	11.0
32150	with removal of intrapleural foreign body or fibrin body	14.0	90	11.0
32160	with cardiac massage	BR+		12.0

(For segmental or other resections of lung, see 32480-32500)

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
32200	Pneumonotomy, with open drainage of pulmonary abscess or cyst	14.0	120	11.0
32205	with removal of foreign body from lung	14.0	90	11.0
32220	Decortication, pulmonary, total (independent procedure)	20.0	90	11.0
32225	partial	14.0	90	11.0

Excision

32400	Biopsy, pleura, needle	1.2	7	
*32420	Pneumonocentesis: puncture of lung for aspiration biopsy	*1.2	0	
32440	Pneumonectomy, total	30.0	90	11.0
32480	Lobectomy, total, subtotal or segmental	26.0	90	11.0
32485	with bronchoplasty	30.0	90	11.0
32490	with concomitant decortication	30.0	90	11.0
32500	Wedge resection, single or multiple	22.0	90	11.0
32520	Pulmonary resection with concomitant thoracoplasty	30.0	90	11.0
32540	Extrapleural enucleation of empyema cavity	20.0	90	11.0
32545	with lobectomy	30.0	90	11.0

Endoscopy

32700	Thoracoscopy, exploratory (independent procedure)	4.0	30	4.0
32705	with biopsy	4.0	30	4.0
32720	Closed intrapleural pneumonolysis	4.0	30	4.0

Surgical Collapse Therapy

Thoracoplasty (see also 32520)

32900	Extrapleural resection of ribs, any type, first stage	14.0	90	9.0
32901	second stage	10.0	90	9.0
32902	third stage	10.0	90	9.0
32920	Extrapleural pneumonolysis, including associated filling or packing procedure	14.0	90	9.0
32940	Extraperiosteal pneumonolysis, including associated filling or packing procedures	14.0	90	9.0
*32960	Pneumothorax: intrapleural injection of air, initial	*1.0	0	
*32961	subsequent	*0.4	0	

Surgical Fees

296-22-120

[Order 74-7, § 296-22-116, filed 1/30/74; Order 68-7, § 296-22-116, filed 11/27/68, effective 1/1/69.]

CARDIOVASCULAR SYSTEM

The listed values are for the principal surgeon only. For concurrent services of other physicians (e.g., team surgery, co-surgeon), see WAC 296-22-010, item 5 and appropriate unit value modifiers.

(For monitoring, operation of pump and other non-surgical services, see 90900-90930)

((For procedures listed "with bypass" (heart pump oxygenator or pump assist), see Anesthesia modifier -45.))

(For medical or laboratory related services, see appropriate section.)

WAC 296-22-120 Heart and pericardium.

Follow-
Unit up Basic
Value Days= Anes@

Incision

33000	Cardiotomy, exploratory (includes removal of foreign body), without bypass	24.0	90	15.0
33005	with bypass	40.0	90	15.0
33020	Pericardiotomy with exploration, drainage or removal of foreign body	20.0	90	13.0
*33040	Pericardiocentesis, initial	*1.2	0	
*33041	subsequent	*1.0	0	
33060	Creation of atrial-septal defect (Blalock-Hanlon type), closed	30.0	90	15.0
33065	transvenous method (balloon) (Rashkind type), including cardiac catheterization	16.0	0	Sv.&
33070	open, with inflow occlusion	38.0	90	15.0

Excision

33100	Pericardiectomy (independent procedure)	34.0	90	15.0
33120	Excision, intracardiac tumor, with bypass	50.0	90	15.0

Introduction

(For injection procedure for coronary arteriography, see 36230)

(For cardiac catheterization, see 93500-93566)

33200	Insertion or replacement of permanent internal pacemaker and myocardial electrodes by thoracotomy	24.0	90	15.0
33210	Insertion of transvenous electrode, temporary (independent procedure)	7.0	15	Sv.&
33220	Insertion or replacement of permanent transvenous electrode and pacemaker	20.0	90	5.0
33225	transvenous electrode only	12.0	90	4.0
33230	pacemaker only	8.0	30	3.0
33235	replacement or repair of pacemaker	8.0	30	3.0

Suture

33300	Cardiorrhaphy: suture of heart wound or injury	24.0	90	15.0
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Repair

33400	Aortic valve repair by valvuloplasty, open, with bypass	50.0	90	15.0
33405	by replacement	52.0	90	15.0
33420	Mitral valve, valvotomy (commissurotomy), closed	32.0	90	15.0
33425	valvuloplasty, with bypass	52.0	90	15.0
33430	replacement, with bypass	52.0	90	15.0
33460	Tricuspid valve, valvuloplasty, with bypass	50.0	90	15.0
33465	replacement, with bypass	52.0	90	15.0
33480	Double valve procedure, replacement and/or repair by any of above methods	70.0	90	15.0
33490	Triple valve procedure, replacement and/or repair by any of above methods	80.0	90	15.0
33500	Pulmonary valve, valvotomy (commissurotomy), closed	32.0	90	15.0
33505	open, with inflow occlusion	32.0	90	15.0
33530	Pulmonary valvular or infundibular stenosis, valvotomy, with bypass	50.0	90	15.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
33550	Myocardial revascularization with implantation of single systemic artery (Vineberg type)	38.0	90	25.0	34015	innominate	18.0	60	12.0
33555	multiple arteries	48.0	90	25.0	34020	renal	20.0	60	6.0
33570	Coronary angioplasty (endarterectomy, arterial implantation or anastomosis), with bypass	60.0	90	15.0	34025	celiac or mesenteric	20.0	60	6.0
33575	combined with vascularization	68.0	90	15.0	34030	aorta-iliac	20.0	60	6.0
33600	Ventricular aneurysm, with bypass	52.0	90	15.0	34035	femoral-popliteal	14.0	60	5.0
33620	Cardiac transplant	BR+		BR+	34040	pulmonary, without bypass	28.0	60	15.0
33640	Atrial septal defect, secundum, without bypass	32.0	90	15.0	34045	with bypass	34.0	60	15.0
33641	with bypass	46.0	90	15.0	34200	Catheter, subclavin	14.0	60	4.0
33660	Endocardial cushion defect, with bypass	50.0	90	15.0	34205	axillary-brachial	14.0	60	4.0
33680	Transposition of great vessels, atrial baffle procedure (i.e., Mustard type), with bypass	BR+		15.0	34210	aorta-iliac	16.0	60	4.0
33700	Ventricular septal defect, with bypass	50.0	90	15.0	34215	femoral-popliteal	14.0	60	4.0
33740	Tetralogy of Fallot, with bypass	50.0	90	15.0	Venous Thrombectomy—direct or with catheter				
33760	Sinus of Valsalva fistula, with bypass	50.0	90	15.0	34400	Vena cava and/or iliac, abdominal approach	18.0	60	5.0
33780	Anomalous coronary vessels, without bypass	32.0	90	15.0	34420	Extremity	12.0	60	3.0
33781	with bypass	50.0	90	15.0	34440	Combined vena cava and extremity, inguinal approach	20.0	60	4.0
33800	Anomalous venous return, with bypass, total	50.0	90	15.0	34445	inguinal and abdominal approach	24.0	60	5.0
33805	partial, with or without atrial septal defect, with bypass	46.0	90	15.0	Excision				

[Order 74-7, § 296-22-120, filed 1/30/74; Order 68-7, § 296-22-120, filed 11/27/68, effective 1/1/69.]

WAC 296-22-125 Arteries and veins.

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Incision									
Arterial Embolectomy									
34000	Direct, carotid	14.0	60	6.0	35000	Aneurysm or occlusive disease, carotid	28.0	90	6.0
34005	subclavian	14.0	60	6.0	35010	axillary-brachial	28.0	90	5.0
					35020	subclavian	30.0	90	6.0
									Thoracic 11.0
34010	axillary-brachial	14.0	60	5.0	35030	innominate	32.0	90	12.0
					35040	ascending arch, with or without valve suspension, with bypass	BR+		15.0
					35045	with valve replacement	BR+		15.0
					35050	transverse arch, with bypass	BR+		15.0
					35060	descending thoracic aorta, without bypass	48.0	90	15.0
					35065	with bypass	56.0	90	15.0
					35070	abdominal aorta	40.0	90	12.0
					35075	involving visceral vessels	BR+		12.0
					35078	involving iliac vessels	40.0	90	12.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
35080	splenic artery	24.0	90	6.0	35580	Aorto-iliac, unilateral .	32.0	90	12.0
35090	hepatic, celiac or mesenteric artery . . .	40.0	90	6.0	35581	bilateral	40.0	90	12.0
35100	renal artery, unilateral	32.0	90	10.0	35590	Aorto-femoral, unilateral	32.0	90	12.0
35101	bilateral	40.0	90	10.0	35591	bilateral	40.0	90	12.0
35110	iliac artery	32.0	90	6.0	35600	Aorto-femoral-popliteal	40.0	90	12.0
35120	common femoral artery	28.0	90	5.0	35610	Femoral-popliteal, unilateral	28.0	90	5.0
35130	popliteal artery	28.0	90	5.0	35611	bilateral	40.0	90	5.0
35200	A-V fistula, neck	28.0	60	6.0	35620	Femoral-femoral bypass	28.0	90	5.0
35210	chest	34.0	90	11.0	Exploration (not followed by surgical repair)				
35220	abdomen	34.0	90	5.0	35700	Carotid	10.0	30	3.0
35230	extremity	28.0	60	3.0	35720	Femoral	8.0	30	3.0
Thromboendarterectomy—					35740	Popliteal	8.0	30	3.0
with or without patch graft					35760	Other	BR+		BR+
(For coronary artery, see 33570, 33575)					Exploration for Post-operative Hemorrhage or Thrombosis				
35300	Carotid or vertebral . . .	30.0	90	6.0	35800	Neck	BR+		BR+
35310	Axillary-brachial	30.0	90	5.0	35820	Chest	BR+		BR+
35320	Subclavian	30.0	90	6.0	35840	Abdomen	BR+		BR+
					35860	Extremity	BR+		BR+
					Introduction				
35330	Innominate	32.0	90	12.0	Injection Procedures for Vascular Radiology				
35340	Abdominal aorta	40.0	90	12.0	Listed values for injection procedures include introduction of needles or catheter, necessary local anesthesia, injection of contrast medium with or without automatic power injection and necessary pre- and post-injection care specifically related to the injection procedure.				
35350	Mesenteric or celiac . . .	40.0	90	6.0	Vascular injection procedures are listed according to site and method of injection (needle or catheter), rather than for a specific radiographic procedure, since a specific injection procedure may be used in conjunction with various radiographic procedures.				
35360	Renal, unilateral	32.0	90	10.0	Cost of catheters, drugs and contrast media is not included in the listed value for the injection procedures.				
35361	bilateral	40.0	90	10.0	An intracatheter, as used in the following procedures, refers to a sheathed combination of needle and short catheter.				
35370	Iliac	32.0	90	6.0	(For injection procedures in conjunction with cardiac catheterization, see 93540)				
35380	Combined aorto-iliac . .	40.0	90	12.0	Intravenous:				
35390	Common and/or deep (profunda) femoral . . .	28.0	90	5.0	36000	needle or intracatheter, unilateral	1.0	0	
35400	Femoral and/or popliteal	28.0	90	5.0	36001	bilateral	1.4	0	
Bypass Graft—vein or synthetic graft					36010	catheter, by placement in superior or inferior vena cava,			
35500	Carotid	30.0	90	6.0					
35510	Carotid-subclavian	30.0	90	6.0					
35520	Subclavian-axillary . . .	30.0	90	6.0					
35530	Axillary-femoral	30.0	90	5.0					
35540	Aorto-subclavian or carotid	32.0	90	12.0					
35550	Aorto-celiac or mesenteric	36.0	90	12.0					
35560	Aorto-renal, unilateral .	32.0	90	12.0					
35561	bilateral	40.0	90	12.0					
35570	Spleno-renal	32.0	90	10.0					

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
	right heart or pulmonary artery	2.0	0	3.0		physician's skill (independent procedure) (not to be used for routine venipuncture)	0.2	0	
36020	by selective catheterization of renal, adrenal, hepatic, etc., veins	4.0	0	3.0					
36030	intraosseous	1.0	0			(For diagnostic collection, see 99000)			
	Intra-arterial—Intra-aortic:				36420	Cut down venipuncture, under age 1 year	1.0	7	
36100	needle or intra-catheter technique, carotid or vertebral, unilateral	5.0	0	3.0	36425	age 1 or over	0.72	7	
36101	bilateral	6.0	0	3.0	36430	Blood transfusion, indirect	0.4	0	
36120	retrograde brachial	5.0	0	3.0	36431	direct	1.2	7	
36140	extremity artery	2.0	0	3.0	36440	Push transfusion, 2 years or under	1.2	0	
36160	aortic, translumbar	3.0	0	3.0	36450	Exchange transfusion, newborn	7.0	0	
36200	catheter technique, aorta (arch, abdominal, midstream renal, aorto-iliac run-off, etc.)	4.0	0	3.0	36455	other than newborn	BR+		
36210	cerebral, selective, single artery	5.8	0	3.0	36460	Intrauterine fetal transfusion	BR+		
36220	multiple cerebral arteries, with or without midstream arch injection	7.0	0	3.0	*36470	Injection of sclerosing solution, single vein	*0.28	0	
36230	coronary, selective, unilateral or bilateral	6.0	0	7.0	*36471	multiple veins, same leg	*0.4	0	
36240	renal, celiac, mesenteric or other artery, selective, single artery, with or without midstream injection	5.0	0	3.0	36480	Central venous pressure catheter placement, subclavian, external jugular or other vein, percutaneous	0.8	7	
36250	bilateral renal or multiple arteries	6.0	0	3.0	36485	by cutdown	0.8	7	
	Venous				36500	Venous catheterization for selective organ blood sampling	BR+		
	Venipuncture, complex or non-routine, needle or catheter for diagnostic study or intravenous therapy, percutaneous:				36510	Umbilical vein catheterization for diagnosis or therapy, newborn	0.6	7	
36400	infant, under age 3 years, femoral, jugular or sagittal sinus	0.4	0		36515	adult	1.0	7	
36405	scalp vein	0.6	0			Arterial			
36410	adult, necessitating				36600	Arterial puncture: withdrawal of blood for diagnosis	0.2	0	
					36620	Arterial catheterization for monitoring or transfusion, percutaneous (independent procedure)	1.0	0	
					36625	cutdown	1.4	7	
					36640	Arterial catheterization for prolonged infusion therapy (chemotherapy), cutdown (see also 96035)	2.0	7	
					36660	Umbilical artery catheterization, newborn, for diagnosis or therapy	1.0	7	

Surgical Fees

296-22-125

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Intervascular Cannulization (independent procedure)					37500	Phleborrhaphy: suture of wound or injury of major vein (independent procedure), neck .	10.0	30	6.0
36800	Cannula insertion for hemodialysis or other purpose, vein to vein ..	3.0	7	3.0	37520	chest	20.0	60	12.0
36810	arterio-venous, external (Scribner type) ..	9.0	7	3.0	37540	abdomen	20.0	60	6.0
36815	revision	6.0	7	3.0	37560	extremity	8.0	30	3.0
36820	internal (Cimino type)	BR+		3.0	37600	Ligation of external carotid	10.0	30	3.0
Repair					37605	internal or common carotid	10.0	30	3.0
37000	Banding of pulmonary artery	24.0	90	13.0	(For application of carotid clamp, see 61565)				
37020	Repair of aortic arch anomalies (vascular ring)	24.0	90	13.0	37620	Ligation and/or division of inferior vena cava ...	16.0	90	5.0
37040	Aorto-pulmonary window, without bypass ...	24.0	90	15.0	37625	plication or clipping of vena cava	16.0	90	5.0
37045	with bypass	50.0	90	15.0	37650	Ligation of femoral vein	8.0	30	3.0
37060	Coarctation, aorta, without bypass, adult (see also 35040, 35060, 35070)	40.0	90	15.0	37660	Ligation and/or division of common iliac vein ..	12.0	90	3.0
37065	child	30.0	90	15.0	37700	Ligation and division of long saphenous vein at saphenofemoral junction, with or without retrograde injection or distal interruptions ...	4.8	30	3.0
37070	with bypass	50.0	90	15.0	37720	Ligation and division and complete stripping of long or short saphenous veins, unilateral	7.0	30	3.0
37090	Systemic pulmonary artery shunt (i.e., Potts, Blalock, etc.)	30.0	90	15.0	37721	bilateral	12.0	30	3.0
37100	Pulmonary-superiorcaval anastomosis (Glenn type procedure)	30.0	90	15.0	37730	long and short saphenous veins, unilateral	10.0	30	3.0
37120	Ligation and division of ductus arteriosus, child	24.0	90	13.0	37731	bilateral	14.5	30	3.0
37125	adult	36.0	90	13.0	37760	Radical subfascial stripping (i.e., Linton type), with or without skin graft	10.0	60	3.0
37140	Portocaval anastomosis	32.0		Thoracic 90 11.0 Abdominal 9.0	37780	Ligation and division of short saphenous vein at saphenopopliteal junction (independent procedure)	2.0	30	3.0
37160	Caval-mesenteric anastomosis	32.0	90	9.0	37785	minor varicose vein of leg	1.2	15	3.0
37180	Spleno-renal anastomosis	32.0	90	9.0	[Order 74-7, § 296-22-125, filed 1/30/74; Order 68-7, § 296-22-125, filed 11/27/68, effective 1/1/69.]				
Suture									
37400	Arteriorrhaphy: suture of wound or injury of major artery (independent procedure), neck ..	12.0	30	6.0					
37420	chest	20.0	60	15.0					
37440	abdomen	20.0	60	9.0					
37460	extremity	10.0	30	4.0					

HEMIC AND LYMPHATIC SYSTEMS

WAC 296-22-130 Spleen.

		Follow- Unit up Value Days=	Basic Anes@
Excision			
38100 Splenectomy		14.5 45	6.0
Introduction			
38200 Injection procedure for splenoportography		2.0 7	3.0

[Order 74-7, § 296-22-130, filed 1/30/74; Order 68-7, § 296-22-130, filed 11/27/68, effective 1/1/69.]

WAC 296-22-135 Lymph nodes and lymphatic channels.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*38300 Drainage of lymph node abscess or lymphadenitis, simple		*0.6 0	3.0
38305 extensive	BR+		3.0
Excision			
38500 Biopsy or excision of lymph node (independent procedure) (except 38510, 38520, 38530)		1.4 15	3.0
38510 deep cervical node		3.4 30	3.0
38520 with excision scalene fat pad		5.0 30	3.0
38530 internal mammary node (independent procedure)		7.0 60	3.0
38550 Excision of cystic hygroma, axillary or cervical, without deep neurovascular dissection		6.0 60	3.0
38555 complex	BR+		3.0
Radical Lymphadenectomy (Radical resection of lymph nodes)			
38700 Supra-hyoid, unilateral		12.0 60	4.0
38701 bilateral		15.0 60	4.0
38720 Cervical (complete), unilateral		19.0 60	4.0
38740 Axillary, superficial		8.0 60	3.0
38745 complete		14.0 60	3.0
38760 Inguinal, superficial, unilateral		8.0 60	3.0
38761 bilateral		12.0 60	3.0

Follow-
Unit up
Value Days= Basic
Anes@

38765 deep, with iliac lymphadenectomy, unilateral		20.0 60	5.0
38766 bilateral		24.0 60	5.0
38780 Retroperitoneal, extensive, including pelvic, aortic, and renal lymphadenectomy		28.0 90	7.0
Introduction			
38790 Injection procedure for lymphangiography, unilateral		3.0 7	
38791 bilateral		4.0 7	

[Order 74-7, § 296-22-135, filed 1/30/74; Order 68-7, § 296-22-135, filed 11/27/68, effective 1/1/69.]

MEDIASTINUM AND DIAPHRAGM

WAC 296-22-140 Mediastinum.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
39000 Mediastinotomy with exploration or drainage, cervical approach		6.0 90	6.0
39010 transthoracic, intercostal		12.0 90	12.0
39020 sternal split		22.0 90	12.0
39050 Foreign body removal, cervical approach		8.0 90	6.0
39060 transthoracic, intercostal		12.0 90	12.0
39070 sternal split		22.0 90	12.0
Excision			
39200 Excision of mediastinal cyst		18.0 90	12.0
39220 Excision of mediastinal tumor		18.0 90	12.0
(For substernal thyroidectomy, see 60270)			
(For thymectomy, see 60520)			
39240 Ligation of thoracic duct, cervical approach		10.0 90	6.0
39245 transthoracic approach		20.0 90	12.0
Endoscopy			
39400 Mediastinoscopy, with or without biopsy	BR+		3.0

Surgical Fees

296-22-150

[Order 74-7, § 296-22-140, filed 1/30/74; Order 68-7, § 296-22-140, filed 11/27/68, effective 1/1/69.]

Follow-
Unit up Basic
Value Days= Anes@

WAC 296-22-141 Diaphragm.

		Follow- Unit up Value Days=	Basic Anes@
Repair			
39500	Repair, diaphragmatic hernia, transabdominal, including fundoplasty, except neonatal	17.0 90	6.0
39510	neonatal	22.0 90	7.0
39520	transthoracic	17.0 90	11.0
39530	combined, thoraco-abdominal	19.0 90	11.0
39540	traumatic, acute BR+		13.0
	(For incidental repair of minor hiatal hernia, see WAC 296-22-010, item 7b)		

[Order 74-7, § 296-22-141, filed 1/30/74. Formerly WAC 296-22-070 (part).]

DIGESTIVE SYSTEM

WAC 296-22-145 Mouth.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*40000	Drainage of sublingual abscess, superficial	*0.4 0	3.0
40005	deep (supra-mylohyoid) BR+		4.0
40010	Drainage of Ludwig's angina BR+		4.0

[Order 74-7, § 296-22-145, filed 1/30/74; Order 68-7, § 296-22-145, filed 11/27/68, effective 1/1/69.]

WAC 296-22-146 Lips.

		Follow- Unit up Value Days=	Basic Anes@
Excision			
	(For excision of mucocele or other small lesion of lip, see 11400-11460, 13000-13300)		
	(For biopsy, see 11100)		
40500	Vermilionectomy ("lip peel")	10.5 120	3.0
40510	Transverse wedge excision, lip	10.5 120	3.0

40520	V-excision of lesion of lip with primary direct linear closure	6.0 120	3.0
40530	Resection of more than one-fourth lip without reconstruction	6.0 120	3.0
	(For lip reconstruction (except 40520), primary or secondary, see 13000-15760)		

Repair (Cheiloplasty)

40700	Plastic repair of cleft lip, primary, partial or complete, unilateral . . .	16.0 90	6.0
40701	bilateral, one stage . .	20.0 90	6.0
40702	two stages, per stage	14.0 90	6.0

(For secondary, local revision, unilateral or bilateral, see 13000-15760)

40720	Plastic repair (secondary) of unilateral cleft lip by re-creation of defect and reclosure	16.0 90	6.0
40740	Plastic repair (secondary) of bilateral cleft lip by re-creation of defect and reclosure, per major stage	14.0 90	6.0

(For plastic or reconstruction operation on lip, see 13000-15760)

[Order 74-7, § 296-22-146, filed 1/30/74. Formerly WAC 296-22-145 (part).]

WAC 296-22-150 Tongue.

		Follow- Unit up Value Days=	Basic Anes@
Incision (Glossotomy)			
*41000	Drainage of lingual abscess	*0.4 0	3.0
Excision (Glossectomy)			
41100	Biopsy of tongue, anterior third	0.6 15	3.0
41105	posterior two-thirds . .	1.0 15	3.0
41120	Glossectomy, partial (less than one-half tongue)	8.0 120	6.0
41130	Hemiglossectomy	12.0 120	6.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
41140	Glossectomy, complete or total, with or without tracheotomy	18.0	120	6.0	Excision				
41145	partial or total, including unilateral radical neck dissection	26.0	120	6.0	42100	Biopsy of palate	0.6	7	3.0
41150	more complex (e.g., mandibular resection)	BR+		6.0	(For excision of local lesion of palate, see 11440-11442, 11640-11660)				
Introduction					(For graft or flap closure, see 14040-14300, 15050, 15120, 15240, 15510-15720)				
41500	Mechanical fixation of tongue other than suture (e.g., K-wire)	5.0	30	3.0	42120	Resection of palate or extensive excision of lesion of palate	BR+		6.0
Repair (Glossoplasty)					(For resection of palate with reconstruction, see 14040-14300, 15050, 15120, 15240, 15510-15720)				
41510	Suture tongue to lip for micrognathia (Douglas type procedure)	10.0	30	3.0	(For plastic repair of tongue, see 13000-15760)				
(For frenuloplasty, see 13000, 13140, 14040)					*42140	Uvulectomy: excision of uvula	*0.6	0	3.0
Suture (Glossorrhaphy)					Repair				
(For suture of injury, see 12020, 12140, 12240, 13000-13300)					42200	Palatoplasty: plastic operation for cleft palate, soft and/or hard palate	16.0	90	6.0
[Order 74-7, § 296-22-150, filed 1/30/74; Order 68-7, § 296-22-150, filed 11/27/68, effective 1/1/69.]					42205	with closure of alveolar ridge, soft tissue .	20.0	90	6.0
WAC 296-22-155 Teeth and gums.					42210	with bone graft to alveolar ridge (includes obtaining graft)	22.0	90	6.0
(For biopsy, see 11100)					(For obtaining bone graft by second surgeon, see WAC 296-22-010, item 5c and modifier -64)				
Incision					42215	major revision	16.0	90	6.0
*41800	Drainage of alveolar or periapical abscess, acute with cellulitis, intraoral	*0.4	0	3.0	42220	secondary lengthening procedure	17.0	90	6.0
41900	Dental surgery			3.0	42225	attachment pharyngeal flap	17.0	90	6.0
[Order 74-7, § 296-22-155, filed 1/30/74; Order 68-7, § 296-22-155, filed 11/27/68, effective 1/1/69.]					(For secondary minor revision, see 13000-14300)				
WAC 296-22-160 Palate and uvula.					Suture				
(For biopsy, see 11100)					(For suture of palate injury, see 13000-14300)				
Incision					[Order 74-7, § 296-22-160, filed 1/30/74; Order 68-7, § 296-22-160, filed 11/27/68, effective 1/1/69.]				
*42000	Incision and drainage of abscess of palate	*0.4	0	3.0					

WAC 296-22-165 Salivary glands and ducts.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*42300	Drainage of parotid ab- scess, simple	*1.4 0	3.0
42305	complicated	BR+	3.0
*42310	Drainage of submaxillary duct or sublingual gland ab- scess	*1.0 0	3.0
42320	Drainage of submaxillary abscess, external, requiring gen- eral anesthesia	3.0 0	3.0
*42330	Sialolithotomy, submaxillary, sublin- gual, or parotid, un- complicated	*0.6 0	3.0
42335	submaxillary, compli- cated	2.4 30	3.0
42340	parotid, extraoral or complicated intraoral	6.0 30	3.0
Excision			
*42400	Biopsy of salivary gland, needle	*0.8 0	
42405	incisional	2.0 30	3.0
42410	Excision of parotid tu- mor or gland, superfi- cial, without nerve dissection	6.0 60	3.0
42415	with nerve dissection	14.5 60	3.0
42420	Excision of parotid gland, total, with dis- section of facial nerve .	18.0 60	3.0
42425	with sacrifice of fa- cial nerve	12.0 60	3.0
42440	Excision of submaxillary tumor and/or gland	10.0 60	3.0
42450	Excision of sublingual gland or tumor	5.5 60	3.0
Repair			
42500	Plastic repair of salivary duct, (sialodochoplasty), primary, simple	7.0 60	3.0
42505	complicated	BR+	3.0
Introduction			
42550	Injection procedure for sialography	0.4 0	
Suture			
42600	Closure of salivary fistula	BR+	3.0

Manipulation

		Follow- Unit up Value Days=	Basic Anes@
*42650	Dilation of salivary duct (ptyalectasis)	*0.3 0	3.0

[Order 74-7, § 296-22-165, filed 1/30/74; Order 68-7, § 296-22-165, filed 11/27/68, effective 1/1/69.]

WAC 296-22-170 Pharynx, adenoids and tonsils.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*42700	Drainage of peritonsillar abscess . .	*0.6 0	3.0
42720	Drainage of retropharyngeal or para-pharyngeal ab- scess, intraoral	2.4 15	3.0
42725	external approach . . .	BR+	3.0
Excision			
42800	Biopsy of oropharynx . .	0.8 7	3.0
42802	hypopharynx	1.4 7	3.0
42804	nasopharynx	1.0 7	3.0
	(For larynx, see 31510, 31535)		
	(For excision of pharyngoesophageal di- verticulum, see 43130)		
42810	Excision branchial cleft cyst or vestige, confined to skin and subcutane- ous tissues	4.0 30	3.0
42815	extending beneath subcutaneous tissues .	10.0 30	3.0
42840	Tonsillectomy, with or without adenoidectomy, under age 12 years	4.0 30	3.0
42841	age 12 or over	4.8 30	3.0
42850	Adenoidectomy (inde- pendent procedure), primary or secondary . .	2.8 30	3.0
42860	Excision of tonsil tag(s)	2.8 30	3.0
42870	Excision of lingual ton- sil (independent proce- dure)	4.8 30	3.0
42880	Excision of nasopharyngeal fibroma	BR+	3.0
Suture			
42900	Suture of wound or in- jury of pharynx	BR+	3.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Repair									
42950	Pharyngoplasty: plastic or reconstructive operation on pharynx	BR+		3.0					
	(For pharyngeal flap, see 42225)								
	(For indirect dilation, see 43450-43455)								
					43230	Esophagogastros- copy (two instrument proce- dure)	6.0	15	3.0
					Repair				
					43300	Esophagoplasty: plastic repair or reconstruction of esophagus	BR+		12.0
					43305	with repair of tracheo-esophageal fistula, cervical ap- proach	22.0	90	6.0
					43310	thoracic approach .	30.0	90	12.0
					43320	Esophagogastros- tomy (cardioplasty)	22.0		Abdominal 90 6.0 Thoracic 11.0
					43330	Esophagomyotomy (Heller type)	19.0		Abdominal 90 6.0 Thoracic 11.0
						(For esophagoduodenostomy or esophagojejunostomy with total gastric resec- tion, see 43620)			
					43340	Esophagojejunostomy (without total gastrectomy)	24.0		Abdominal 90 6.0 Thoracic 11.0
					43350	Esophagostomy: fistulization of esopha- gus, external	14.0		Abdominal 90 6.0 Thoracic 11.0
Incision					Suture				
43000	Esophagotomy, cervical	14.0	90	6.0	43400	Direct ligation of esophageal varices	20.0	90	12.0
43020	for removal of foreign body, cervical ap- proach	14.0	90	6.0	43410	Suture of esophageal wound, injury or rup- ture, cervical approach	BR+		7.0
43040	thoracic approach .	19.0	90	12.0	43415	transthoracic	19.0	90	12.0
Excision					43420	Closure of esophagostomy or other external esophageal fistula, cervical	14.0	90	6.0
43100	Excision, local lesion of esophagus with primary repair	19.0	90	12.0	43425	thoracic	26.0	90	12.0
43110	Esophagectomy: resec- tion of esphagus, transpleural or extrapleural (upper two-thirds) with gastric anastomosis, with or without pyloroplasty or vagotomy	30.0	90	12.0					
43115	with segment replace- ment, bowel or pros- thesis, one or two stages	40.0	90	12.0					
43120	Esophagogastrectomy, combined thoraco-ab- dominal	29.0	90	12.0					
43130	Diverticulectomy, cervi- cal approach	14.0	90	6.0					
43135	thoracic approach . .	20.0	90	12.0					
Endoscopy									
43200	Esophagoscopy, diag- nostic	4.0	15	3.0					
43205	with insertion of ra- dioactive substance . .	4.8	15	3.0					
	(For radiotherapist ser- vices, see 77520-77560)								
43210	with biopsy	4.8	15	3.0					
43215	with foreign body re- moval	6.0	15	3.0					
43220	with dilation, direct .	4.8	15	3.0					

Surgical Fees

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		Follow- Unit Value	up Days=	Basic Anes@
Manipulation				
*43450	Dilation of esophagus by sound or bougie, indirect, initial	*0.6	0	3.0
*43451	subsequent	*0.6	0	3.0
	(For direct, see 43220)			
43455	by balloon	4.0	15	3.0
43460	Esophagogastric tamponade, with balloon (Sengstaaken type)			Sv.&

[Order 74-7, § 296-22-180, filed 1/30/74; Order 68-7, § 296-22-180, filed 11/27/68, effective 1/1/69.]

WAC 296-22-190 Stomach.

		Follow- Unit Value	up Days=	Basic Anes@
Incision				
43500	Gastrotomy with exploration or foreign body removal	12.0	45	5.0
43520	Pyloromyotomy: cutting of pyloric muscle (Fredet-Ramstedt type operation)	10.0	45	6.0
Excision				
43600	Biopsy by capsule, peroral, via tube (one or more specimens)	3.0	0	
43605	by laparotomy	12.0	45	5.0
43610	Local excision of ulcer or tumor	14.5	45	6.0
43620	Total gastrectomy	28.0	90	7.0
43625	with repair by intestinal transplant	34.0	90	7.0
43630	Subtotal or hemi-gastrectomy, without vagotomy	19.0	60	6.0
43635	with vagotomy	21.0	60	6.0
43640	Vagotomy and pyloroplasty, with or without gastrotomy	17.0	60	6.0
	(For pyloroplasty, see 43800)			
	(For vagotomy, see 64070-64072)			

Endoscopy

43700	Gastrosocopy, diagnostic	4.0	7	3.0
43705	with biopsy	4.8	7	3.0

		Follow- Unit Value	up Days=	Basic Anes@
43720	Gastrocamera photo series (as with GT-V)	2.0	0	
Suture				
43800	Pyloroplasty	13.0	45	5.0
	(For pyloroplasty and vagotomy, see 43640)			
43810	Gastroduodenostomy	14.0	45	5.0
43820	Gastrojejunosotomy	14.0	45	5.0
43825	with vagotomy	18.0	45	6.0
43830	Gastrostomy, temporary (tube) (independent procedure)	13.0	45	5.0
43831	neonatal, for feeding	8.0	30	5.0
43832	permanent	16.0	45	5.0
43840	Gastrorrhaphy: suture of perforated duodenal or gastric ulcer, wound or injury	13.0	45	6.0
43850	Revision of gastroduodenal anastomosis (gastroduodenostomy) with reconstruction, without vagotomy	20.0	60	5.0
43855	with vagotomy	23.0	60	6.0
43860	Revision of gastrojejunal anastomosis (gastrojejunosotomy) with reconstruction, without vagotomy	20.0	60	5.0
43865	with vagotomy	23.0	60	6.0
43870	Closure of gastrostomy, surgical	12.0	45	5.0
43880	Closure of gastro-colic fistula	BR+		5.0

[Order 74-7, § 296-22-190, filed 1/30/74; Order 68-7, § 296-22-190, filed 11/27/68, effective 1/1/69.]

WAC 296-22-195 Intestines (except rectum).

		Follow- Unit Value	up Days=	Basic Anes@
Incision				
44000	Enterolysis (freeing of intestinal adhesion) (independent procedure)	10.0	45	4.0
	(For incidental enterolysis, see WAC 296-22-010, item 7b)			
44005	with acute bowel obstruction	14.5	90	6.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
44020	Enterotomy with exploration or foreign body removal, small bowel ..	14.5	60	4.0	44340	Revision of colostomy, simple (release of superficial scar)	1.2	90	
44025	large bowel	15.0	60	4.0	44345	complicated (reconstruction in depth) ..	6.0	60	4.0
44040	Exteriorization of intestine (Mikulicz resection, with crushing of spur) .	18.0	60	5.0	Suture				
44050	Reduction of volvulus, intus-susception, internal hernia, by laparotomy	14.0	90	5.0	44600	Suture of intestine (enterorrhaphy), large or small, for perforated ulcer, wound, injury or rupture, single	14.0	45	7.0
Excision					44605	with colostomy	16.0	90	7.0
44100	Biopsy by capsule, peroral, via tube (one or more specimens) ...	3.0	0		44610	multiple	BR+		7.0
44110	Excision of one or more lesions of small or large bowel not requiring anastomosis, exteriorization or fistulization, single enterotomy	16.0	60	4.0	44620	Closure of enterostomy, large or small intestine .	10.0	90	5.0
44111	multiple enterotomies	BR+		4.0	44625	with resection and anastomosis	14.0	90	6.0
44120	Enterectomy: resection of small intestine with anastomosis	17.0	60	6.0	44640	Closure of intestinal cutaneous fistula	BR+		4.0
44125	with double-barrel enterostomy	14.0	60	6.0	44650	Closure of enteroenteric or enterocolic fistula ...	14.0	90	5.0
44130	Enterointerostomy: anastomosis of intestine (independent procedure)	14.5	90	5.0	44660	Closure of enterovesical fistula	14.0	90	5.0
44140	Colectomy, partial, with anastomosis	18.0	90	5.0	(For closure of renocolic fistula, see 50525)				
44145	with coloproctostomy (low pelvic anastomosis)	24.0	90	6.0	(For closure of gastrocolic fistula, see 43880)				
44150	total, with ileostomy or ileoproctostomy ..	26.0	90	6.0	(For closure of rectovesical fistula, see 45800, 45805)				
44155	with proctectomy and ileostomy	30.0	90	6.0	44680	Intestinal plication, complete (Noble type procedure) (independent procedure)	20.0	90	6.0

[Order 74-7, § 296-22-195, filed 1/30/74; Order 68-7, § 296-22-195, filed 11/27/68, effective 1/1/69.]

WAC 296-22-200 Meckel's diverticulum and the mesentery.

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Enterostomy—External fistulization of intestines (independent procedure):					Excision				
44300	Tube enterostomy or cecostomy (independent procedure)	8.5	90	4.0	44800	Excision of Meckel's diverticulum (diverticulectomy) or omphalomesenteric ...	10.0	45	4.0
44305	in conjunction with other procedures	2.0	90		44820	Excision of lesion of mesentery (independent procedure) (with bowel resection, see 44120) ..	BR+		4.0
44310	Ileostomy, permanent ..	14.5	90	4.0					
44320	Colostomy or skin level cecostomy	12.0	90	4.0					

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Suture					perineal, one or two stages..... 26.0 90 7.0				
44850	Suture of mesentery (independent procedure)	13.0	45	4.0	45120	Complete proctectomy for congenital megacolon (Swenson type procedure)	26.0	90	7.0
(For reduction and repair of internal hernia, see 44050)					45130	Excision of rectal procidentia, with anastomosis, perineal approach	14.5	90	4.0
[Order 74-7, § 296-22-200, filed 1/30/74; Order 68-7, § 296-22-200, filed 11/27/68, effective 1/1/69.]					45135	abdominal and perineal approach ..	26.0	90	6.0
WAC 296-22-205 Appendix.					45150	Division of stricture of rectum	BR+		3.0
		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Incision					45160	Perineal excision of primary or recurrent malignant tumor (Kraske type)	19.0	90	3.0
44900	Incision and drainage of appendiceal abscess, transabdominal	7.0	45	4.0	45170	Local excision of extensive villous adenoma of rectum	BR+		3.0
Excision					Endoscopy (independent procedure)				
44950	Appendectomy	9.5	45	4.0	45300	Proctosigmoidoscopy (independent procedure), diagnostic, initial or subsequent ..	0.6	0	3.0
(For incidental appendectomy, see WAC 296-22-010, item 7b and modifier -52)					45305	with biopsy, initial ..	1.2	7	3.0
[Order 74-7, § 296-22-205, filed 1/30/74; Order 68-7, § 296-22-205, filed 11/27/68, effective 1/1/69.]					45306	subsequent for same lesion	0.72	7	3.0
WAC 296-22-210 Rectum.					45310	with removal of papilloma or polyp, initial	1.4	7	3.0
		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Incision					45311	subsequent for same lesion	1.0	7	3.0
45000	Transrectal drainage of pelvic abscess	3.0	15	3.0	45315	with removal of multiple papillomas or polyps, simple	1.8	7	3.0
45020	Incision and drainage of deep supralevator, pelvirectal or retrorectal abscess (see also 46050, 46060)	4.8	30	3.0	45320	complicated	BR+		3.0
Excision					45340	Endoscopic control of hemorrhage.....	BR+		3.0
45100	Biopsy, incisional, anorectal wall, anal approach (e.g., congenital megacolon)	4.0	15	3.0	45350	Endoscopic removal of foreign body, anus or rectum	BR+		3.0
(For endoscopic biopsy, see 45305)					Repair				
45105	full thickness	6.0	30	3.0	45500	Proctoplasty, for stenosis	10.0	90	3.0
45110	Complete proctectomy, combined abdomino-				45505	for prolapse of mucous membrane	11.0	90	3.0
					45520	Perirectal injection of sclerosing solution for prolapse, office	1.0	0	
					45521	hospital	4.0	30	3.0
					45540	Proctopexy for prolapse, abdominal or perineal approach			Abdominal

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
		18.0	90	4.0	*46080	Sphincterotomy, anal: division of anal sphincter (independent procedure)	*1.2	0	3.0
				Perineal 3.0					
45550	Protopexy combined with sigmoid resection, abdominal approach . . .	22.0	90	5.0	Excision				
Suture									
45800	Closure of rectovesical fistula	20.0	90	5.0	46200	Fissurectomy, with or without sphincterotomy	4.8	90	3.0
45805	with colostomy	22.0	90	5.0	46210	Cryptectomy, single, office	1.4	30	3.0
45820	Closure of rectourethral fistula	20.0	90	3.0	46211	multiple, hospital (independent procedure)	7.0	90	3.0
45825	with colostomy	22.0	90	4.0	46220	Papillectomy or excision of single tab, office (independent procedure) . .	0.6	15	3.0
	(For rectovaginal fistula closure, see 57300-57307)				46230	Excision of external hemorrhoid tags and/or multiple papillae, office	1.2	15	3.0
Manipulation									
*45900	Reduction of procidentia (independent procedure)	*0.6	0		46250	Hemorrhoidectomy, external, complete	4.8	90	3.0
[Order 74-7, § 296-22-210, filed 1/30/74; Order 68-7, § 296-22-210, filed 11/27/68, effective 1/1/69.]									
WAC 296-22-215 Anus.									
		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Incision									
*46000	Fistulotomy, subcutaneous	*0.6	0	3.0	46255	internal and external	7.0	90	3.0
	(For fistulectomy, see 46060, 46270-46300)				46260	radical (Whitehead type procedure)	10.0	90	3.0
*46030	Seton removal, office . .	*0.6	0		46270	Fistulectomy, subcutaneous	2.4	30	3.0
46040	Incision and drainage of ischiorectal and/or perirectal abscess (independent procedure) . . .	2.4	15	3.0	46275	submuscular	9.5	90	3.0
*46050	Incision and drainage, perianal abscess, superficial (see also 45020, 46060)	*0.48	0	3.0	46280	complex or multiple .	BR+		3.0
46060	Incision and drainage of ischiorectal abscess with fistulectomy, submuscular (see also 45020)	9.5	90	3.0	46285	second stage	2.0	30	3.0
46070	Incision, anal septum (infant)	1.2	0	3.0	46300	Fistulectomy, submuscular, with hemorrhoidectomy	9.5	90	3.0
	(For anoplasty, see 46700-46705)				46310	Fissurectomy and hemorrhoidectomy	8.0	90	3.0
					*46320	Enucleation or excision of external thrombotic hemorrhoid	*0.72	0	3.0
Introduction									
					*46500	Hemorrhoids, injection of sclerosing solution . .	*0.4	0	3.0
Endoscopy									
					*46600	Anoscopy, diagnostic, with or without biopsy (independent procedure)	*0.32	0	3.0
						(For removal of foreign body, see 45350)			
						(For control of hemorrhage, endoscopic, see 45340)			
Repair									
					46700	Anoplasty: plastic operation for stricture,			

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		Follow- Unit up Value Days=	Basic Anes@	
46705	adult	9.0	90	3.0
	infant	10.0	30	4.0
	(For simple incision of anal septum, see 46070)			
46720	Repair of congenital anovaginal fistula ("cut-back" type procedure)	12.0	90	4.0
46730	Construction of anus for congenital absence, perineal or sacrococcygeal approach	16.0	90	5.0
46735	combined abdominal and perineal approach	20.0	90	7.0
46740	with repair of urinary fistula	22.0	90	7.0
46750	Sphincteroplasty, anal, for incontinence, adult .	10.0	90	3.0
46751	child	12.0	90	4.0
46760	muscle transplant ...	BR+		4.0

Destruction

*46900	Condylomata, multiple, simple, chemical	*0.48	0	
*46910	electrodessication ...	*0.8	0	3.0
*46920	surgical excision, simple	*1.0	0	3.0
46930	complicated	BR+		3.0

[Order 74-7, § 296-22-215, filed 1/30/74; Order 68-7, § 296-22-215, filed 11/27/68, effective 1/1/69.]

WAC 296-22-220 Liver.

		Follow- Unit up Value Days=	Basic Anes@	
Incision				
*47000	Needle biopsy of liver, percutaneous	*1.4	0	3.0
Excision				
47100	Wedge biopsy (independent procedure)	10.0	45	4.0
47120	Hepatectomy (resection of liver), partial lobectomy	19.0	45	10.0
47125	total left lobectomy .	BR+		13.0
47130	total right lobectomy	BR+		13.0
47135	total, with transplant	BR+		15.0
Repair				
47300	Marsupialization of cyst or abscess of liver	14.5	60	6.0

Suture

		Follow- Unit up Value Days=	Basic Anes@	
47350	Hepatorrhaphy: suture of liver wound or injury, simple	14.0	45	4.0
47355	with common duct or gallbladder drainage .	18.0	45	7.0
47360	complex	BR+		9.0

[Order 74-7, § 296-22-220, filed 1/30/74; Order 68-7, § 296-22-220, filed 11/27/68, effective 1/1/69.]

WAC 296-22-225 Biliary tract.

		Follow- Unit up Value Days=	Basic Anes@	
Incision				
47400	Hepaticotomy or hepaticostomy with exploration, drainage or removal of calculus ...	20.0	45	6.0
47420	Choledochotomy or choledochostomy with exploration, drainage or removal of calculus, with or without cholecystotomy	17.0	45	5.0
47425	with transduodenal sphincterotomy	19.0	45	6.0
47440	Duodenocholedochotomy: transduodenal choledocholithotomy ..	19.0	45	6.0
47460	Transduodenal sphincterotomy (independent procedure) ...	19.0	45	6.0
47480	Cholecystotomy or cholecystostomy with exploration, drainage or removal of calculus (independent procedure)..	12.0	45	5.0
Introduction				
47500	Injection procedure for percutaneous trans-hepatic cholangiography .	1.6	0	
Excision				
47600	Cholecystectomy	14.5	45	5.0
47605	with cholangiography	15.0	45	5.0
47610	with open exploration of common duct	17.0	45	6.0
47620	with transduodenal sphincterotomy	20.0	45	6.0

		Follow- Unit up Value Days=	Basic Anes@
Repair			
47700	Exploration for congenital atresia of bile ducts, without repair	14.5 45	6.0
47720	Direct anastomosis of gallbladder and gastrointestinal tract	14.5 60	5.0
47740	Roux-en-y anastomosis of gallbladder and gastrointestinal tract	16.0 60	6.0
47760	Direct anastomosis of extrahepatic biliary ducts and gastrointestinal tract	20.0 90	6.0
47765	intrahepatic ducts . . .	BR+	6.0
47780	Roux-en-y anastomosis of extrahepatic biliary ducts and gastrointestinal tract	22.0 90	6.0
47800	Plastic reconstruction of extrahepatic biliary ducts with end-to-end anastomosis	20.0 90	6.0

[Order 74-7, § 296-22-225, filed 1/30/74; Order 68-7, § 296-22-225, filed 11/27/68, effective 1/1/69.]

WAC 296-22-230 Pancreas.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
48000	Abdominal drainage of pancreatitis	13.0 60	5.0
48020	Removal of pancreatic calculus	20.0 60	6.0
Excision			
48100	Biopsy of pancreas (independent procedure) . .	14.0 60	5.0
48120	Excision of lesion of pancreas (e.g., cyst, adenoma)	17.0 60	6.0
48140	Pancreatectomy, subtotal	20.0 60	6.0
48145	with pancreatico-jejunosomy	22.0 60	6.0
48150	Whipple type	34.0 60	6.0
48155	total	34.0 60	6.0
48160	with transplantation	BR+	6.0
48180	Pancreatico-jejunosomy (e.g., Puestow type procedure) (independent procedure)	24.0 60	6.0

		Follow- Unit up Value Days=	Basic Anes@
Repair			
48500	Marsupialization of cyst of pancreas	14.5 60	6.0
48520	Internal direct anastomosis of cyst to gastrointestinal tract . .	17.0 60	6.0
48540	Roux-en-y internal anastomosis, cyst to gastrointestinal tract . .	19.0 60	6.0

[Order 74-7, § 296-22-230, filed 1/30/74; Order 68-7, § 296-22-230, filed 11/27/68, effective 1/1/69.]

WAC 296-22-235 Abdomen, peritoneum and omentum.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
49000	Exploratory laparotomy: exploratory celiotomy (independent procedure) (see WAC 296-22-010, item 7b) .	10.0 45	4.0
49010	Retroperitoneal exploration (independent procedure)	10.0 45	5.0
49020	Drainage of peritoneal abscess, or localized peritonitis exclusive of appendiceal abscess, transabdominal	11.0 45	4.0
	(For appendiceal abscess, see 44900)		
49040	subdiaphragmatic or subphrenic abscess . .	12.0 45	5.0
49060	Drainage of retroperitoneal abscess	11.0 45	5.0
*49080	Peritoneocentesis: abdominal paracentesis, initial	*0.8 0	
*49081	subsequent	*0.6 0	
Excision			
49000	Excision of intra-abdominal or retroperitoneal tumors or cysts . .	14.0 60	5.0
Endoscopy			
49300	Peritoneoscopy, with or without biopsy	4.0 15	3.0
Introduction			
*49400	Pneumoperitoneum, initial	*1.0 0	

	Unit Value	Follow-up Days=	Basic Anes@
*49401 subsequent.....	*0.6	0	
*49420 Insertion of intraperitoneal cannula	*1.0	0	
49430 Injection procedure for retroperitoneal pneumography	2.4	0	
49440 Injection procedure for pelvic pneumography ..	0.8	0	

Suture

	Unit Value	Follow-up Days=	Basic Anes@
49900 Secondary suture of abdominal wall for evisceration or dehiscence .	6.0	30	5.0
(For suture of ruptured diaphragm, see 39540)			

[Order 74-7, § 296-22-235, filed 1/30/74; Order 68-7, § 296-22-235, filed 11/27/68, effective 1/1/69.]

Repair

Hernioplasty, Herniorrhaphy, Herniotomy:

(For bilateral herniorrhaphy or with bowel resection, see WAC 296-22-010, item 7)

(For reduction and repair of intro-abdominal hernia, see 44050)

49500 Inguinal, under age 5 years, with or without hydrocelectomy, unilateral	7.0	45	3.0
49501 bilateral	9.5	45	3.0
49505 age 5 or over, unilateral	9.0	45	3.0
49506 bilateral	12.0	45	3.0
49510 with orchiectomy .	9.5	45	3.0
49515 with excision of hydrocele or spermatocele	9.5	45	3.0
49520 recurrent	10.0	45	3.0
49525 sliding	10.0	45	3.0
49540 Lumbar, unilateral	10.0	45	3.0
49550 Femoral, unilateral	9.0	45	3.0
49555 recurrent	10.0	45	3.0
49560 Ventral	11.0	45	3.0
49565 recurrent	12.0	45	3.0
49570 Epigastric, simple, properitoneal fat	3.0	45	3.0
49575 more complex	7.0	45	3.0
49480 Umbilical, under age 5 years	7.0	45	3.0
49581 age 5 or over	8.5	45	3.0
49590 Spigelian hernia	9.0	45	3.0
49600 Repair of omphalocele, in newborn, simple	9.5	45	6.0
49605 giant (gastroschisis) .	14.5	60	9.0
49610 Gross type procedure, first stage	12.0	60	8.0
49611 second stage	12.0	60	7.0

(For diaphragmatic or hiatal hernia repair, see 39500-39530)

URINARY SYSTEM

WAC 296-22-245 Kidney.

	Unit Value	Follow-up Days=	Basic Anes@
Incision			
(For retroperitoneal exploration or abscess, see 49010, 49060)			
50000 Aspiration and/or injection of renal cyst or pelvis, percutaneous ...	2.4	7	
50020 Drainage of perirenal or renal abscess (independent procedure).....	14.0	90	5.0
50040 Nephrostomy; nephrotomy with drainage.....	20.0	90	5.0
50060 Nephrolithotomy, removal of calculus	20.0	90	5.0
50065 secondary surgical operation for stone ..	24.0	90	5.0
50070 complicated by congenital kidney abnormality	24.0	90	5.0
50075 large (staghorn) calculus filling renal pelvis and calyces ...	26.0	90	5.0
50100 Transection or repositioning of aberrant renal vessels (independent procedure)	17.0	90	5.0
50120 Pyelotomy, with exploration	20.0	90	5.0
50125 with drainage, pyelostomy	20.0	90	5.0
50130 with removal of calculus; pyelolithotomy; pelviolithotomy	20.0	90	5.0
50135 complicated (e.g., secondary operation, congenital kidney abnormality)	24.0	90	5.0

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@	
Excision					50380	Renal auto-transplantation: reimplantation of kidney	30.0	120	6.0
	(For excision of retroperitoneal tumor or cyst, see 49200)				Introduction	(For injection procedure for retroperitoneal pneumography, see 49430)			
50200	Renal biopsy, percutaneous, by trochar or needle	2.4	7			(For injection and/or aspiration of renal cyst or pelvis, see 50000)			
50205	by surgical exposure of kidney	8.0	30	5.0	Repair				
50220	Nephrectomy, including partial ureterectomy, any approach including rib resection	20.0	90	5.0	50400	Pyeloplasty: plastic operation on renal pelvis with or without plastic operation on ureter or nephropexy	22.0	90	5.0
50225	complicated because of previous surgery on same kidney	24.0	90	5.0	50405	complicated (e.g., congenital kidney abnormality, secondary pyeloplasty, solitary kidney)	26.0	90	5.0
50230	radical, with regional lymphadenectomy	26.0	90	5.0	50420	Nephropexy: fixation or suspension of kidney (independent procedure)	16.0	90	5.0
50235	with total ureterectomy through same or separate incision	24.0	90	5.0	Suture				
50240	partial	24.0	90	5.0	50500	Nephrorrhaphy: suture of kidney wound or injury	20.0	90	8.0
50260	Decapsulation, unilateral	18.0	90	5.0	50520	Closure of nephro-cutaneous or pylo-cutaneous fistula	20.0	90	5.0
50261	bilateral	26.0	90	5.0	50525	Closure of nephro-visceral fistula (e.g., renocolic), including visceral repair	24.0	90	5.0
50280	Excision or unroofing of cyst(s) of kidney	18.0	90	5.0				Abdominal 90	5.0
Renal Transplantation								Thoracic 11.0	
	(For dialysis, see 90940-90961)					(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)			
50300	Donor nephrectomy, with preparation and maintenance of homograft from cadaver donor, unilateral or bilateral	BR+			50540	Symphysiotomy for horseshoe kidney with or without pyeloplasty and/or other plastic procedure, unilateral or bilateral (one operation)	28.0	90	5.0
50320	from living donor, unilateral	24.0	90	5.0					
50340	Recipient nephrectomy, unilateral (independent procedure)	20.0	90	5.0					
50341	bilateral	30.0	90	5.0					
50360	Renal homo-transplantation: implantation of graft, excluding donor and recipient nephrectomy	30.0	180	6.0					
50365	with unilateral recipient nephrectomy	50.0	180	6.0					
50366	bilateral recipient nephrectomy	50.0	180	6.0					

[Order 74-7, § 296-22-245, filed 1/30/74; Order 68-7, § 296-22-245, filed 11/27/68, effective 1/1/69.]

WAC 296-22-250 Ureter.

		Follow-	Basic	Follow-		
		Unit	Anes@	Unit	up	Basic
		Value		Value	Days=	Anes@
				50800	Ureteroenterostomy: direct anastomosis of ureter to intestine, unilateral	22.0 90 5.0
Incision				50801	bilateral	26.0 90 5.0
50600	Ureterotomy with exploration or drainage (independent procedure)	18.0	90 5.0	50810	Uretersigmoidostomy with creation of sigmoid bladder and establishment of abdominal or perineal colostomy, including bowel anastomosis . . .	30.0 120 6.0
50620	Ureterolithotomy, middle one-third of ureter	18.0	90 5.0			
50625	upper or lower one-third	20.0	90 5.0			
Excision					(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)	
	(For ureterocele, see 51535, 51536, 52300)					
50650	Ureterectomy, with bladder cuff (independent procedure)	20.0	90 5.0	50820	Uretero-ileal conduit (ileal bladder), including bowel anastomosis, unilateral	30.0 120 6.0
Repair					(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)	
50700	Ureteroplasty: plastic operation on ureter (e.g., stricture)	20.0	90 5.0	50821	bilateral	34.0 120 6.0
50720	Ureterolysis, with or without repositioning of ureter for retroperitoneal fibroses, ovarian vein syndrome, etc., unilateral	16.0	90 5.0		(For combination of 50800-50821 with cystectomy, see 51580-51595)	
50721	bilateral	24.0	90 5.0	50840	Replacement of all or part of ureter by bowel segment, including bowel anastomosis, unilateral	30.0 120 6.0
50725	for retrocaval ureter with reanastomosis of upper urinary tract or vena cava	26.0	90 5.0		(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)	
50740	Ureteropyelostomy: anastomosis of ureter and renal pelvis	22.0	90 5.0	50841	bilateral	40.0 120 6.0
50760	Ureteroureterostomy	22.0	90 5.0	50860	Ureterostomy: transplantation of ureter to skin, unilateral	18.0 90 5.0
50770	Transureteroureterostomy: anastomosis of ureter to contralateral ureter	24.0	90 5.0	50861	bilateral	22.0 90 5.0
50780	Ureteroneocystostomy: anastomosis of ureter to bladder, or other operations for correction of vesico-ureteral reflux, unilateral	22.0	90 5.0	Suture		
50781	bilateral	26.0	90 5.0	50900	Ureterorrhaphy: suture of ureter (independent procedure)	20.0 90 5.0
	(When combined with cysto-urethroplasty or vasical neck revision, see 51820)			50920	Closure of uretero-cutaneous fistula	20.0 90 5.0
50785	with bladder flap, unilateral	24.0	90 5.0	50930	Closure of uretero-visceral fistula	BR+ 5.0
50786	bilateral	28.0	90 5.0			

		Follow- Unit Value	up Days=	Basic Anes@
50940	Deligation of ureter ... (For ureteroplasty, ureterolysis, etc., see 50700-50861)	BR+		5.0

[Order 74-7, § 296-22-250, filed 1/30/74; Order 68-7, § 296-22-250, filed 11/27/68, effective 1/1/69.]

WAC 296-22-255 Bladder.

		Follow- Unit Value	up Days=	Basic Anes@
Incision				
51000	Aspiration of bladder by needle.....	0.4	0	
*51005	by trochar or intra- catheter.....	*1.0	0	
51010	with insertion of suprapubic catheter.....	2.0	30	5.0
51029	Cystotomy or cystostomy with fulguration and/or insertion of radioactive material....	14.5	90	5.0
51030	Cystotomy or cystostomy with cryosurgical destruction of intravesical lesion.....	14.5	90	5.0
51040	Cystostomy: cystotomy with drainage.....	12.0	90	5.0
51050	Cystolithotomy: cystotomy with removal of calculus, without vesical neck resection.....	14.5	90	5.0
51080	Drainage of perivesical or prevesical space abscess.....	8.0	90	5.0

Excision

51500	Excision of urachal cyst or sinus, with or without umbilical hernia repair.	14.0	90	5.0
51520	Cystotomy for simple excision of vesical neck (independent procedure).....	16.0	90	5.0
51525	for excision of bladder diverticulum, single or multiple (independent procedure).....	20.0	90	5.0
51530	for excision of bladder tumor.....	16.0	90	5.0

(For transurethral excision, see 52200-52240)

		Follow- Unit Value	up Days=	Basic Anes@
51535	for excision or incision of ureterocele, unilateral.....	16.0	90	5.0
51536	bilateral.....	18.0	90	5.0
	(For transurethral excision, see 52300)			
51560	Cystectomy, partial....	18.0	90	6.0
51565	with re-implantation of ureter(s) into bladder (ureteroneocystostomy) ..	24.0	90	6.0
51570	complete (independent procedure).....	26.0	90	6.0
51575	with pelvic and bilateral iliac lymphadenectomy (independent procedure).....	34.0	90	6.0
51580	with ureterosigmoidostomy or ureterocutaneous transplantations ..	34.0	120	7.0
51585	with pelvic and bilateral iliac lymphadenectomy	40.0	120	7.0
51590	with uretero-ileal conduit or sigmoid bladder, including bowel anastomosis	44.0	120	7.0
51595	with pelvic and bilateral iliac lymphadenectomy	50.0	120	7.0
	(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)			

Introduction

51600	Injection procedure for cystography.....	0.2	0	
51610	Injection procedure for urethrocystography....	0.3	0	
	(For injection procedure for retroperitoneal pneumography, see 49430)			
*51700	Bladder irrigation, simple, lavage and/or instillation	*0.2	0	
51720	Bladder instillation of anticarcinogenic agent (including detention time).....	0.8	0	

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
51740	Cystometrogram (independent procedure)	1.0	0		52005	with ureteral catheterization	1.6	7	
Repair					52010	with ejaculatory duct catheterization	1.6	7	
51800	Cystoplasty or cystourethroplasty: plastic operation on bladder and/or vesical neck (anterior Y-plasty, vesical fundus resection, etc.), any procedure	20.0	90	5.0	52100	hospital	2.0	7	3.0
51820	Cystourethroplasty with unilateral or bilateral ureteroneocystostomy . .	30.0	90	5.0	52105	with ureteral catheterization	3.6	7	3.0
51840	Anterior vesico-urethropexy, or urethropexy (i.e., Marshall-Marchetti type) .	14.5	90	4.0	52110	with ejaculatory duct catheterization	3.6	7	3.0
51860	Cystorrhaphy: suture of bladder wound, injury or rupture, simple	14.5	90	4.0	52190	Differential quantitative and chemical renal function test (e.g., Howard or Stamey type), see 52005 or 52105, and add detention time (see 99040) beyond that required for usual ureteral catheterization	SV.&		3.0
51865	complicated	BR+		6.0	Transurethral Surgery (urethra, prostate, bladder, ureter)				
51880	Closure of cystostomy (independent procedure)	8.0	90	3.0	52200	Cystourethroscopy with biopsy	2.6	7	3.0
51900	Closure of vesicovaginal fistula, abdominal approach	22.0	90	5.0	52210	with fulguration (including cryosurgery) of trigone, bladder neck, prostatic fossa, urethra, or periurethral glands . .	2.6	7	3.0
	(For vaginal approach, see 57320-57330)				52220	with fulguration (including cryosurgery) or treatment of minor (less than 0.5 cm) lesion(s), with or without biopsy	2.6	7	3.0
51920	Closure of vesicouterine fistula with or without hysterectomy	20.0	90	5.0	52230	with fulguration (including cryosurgery) and/or resection of small bladder tumor(s) (0.5 cm to 2.0 cm)	6.0	30	3.0
	(For closure of vesicoenteric fistula, see 44660)				52235	medium bladder tumor(s) (2.0-5.0 cm)	12.0	30	3.0
51940	Closure of extrophy . . .	BR+		5.0	52240	large bladder tumor(s)	18.0	30	5.0
51960	Enterocystoplasty including bowel anastomosis	30.0	90	5.0	52250	with insertion of radioactive substance, with or without biopsy or fulguration . . .	6.0	30	3.0
	(For supplemental skills of two surgeons, see WAC 296-22-010, item 5b, and modifier -62)				52260	with dialation of bladder for interstitial cystitis, general or conduction (spinal, etc.) anesthesia	3.0	30	3.0
51980	Cutaneous vesicostomy .	18.0	90	5.0	52265	local anesthesia . . .	1.4	7	
Endoscopy									
Cystoscopy, Urethroscopy, Cystourethroscopy									
52000	Diagnostic cystourethroscopy (independent procedure), office	1.2	7						

		Follow-				Follow-			
		Unit	up	Basic		Unit	up	Basic	
		Value	Days=	Anes@		Value	Days=	Anes@	
52270	with internal urethrotomy, female .	4.0	45	3.0					
52275	male	4.0	45	3.0					
52280	with calibration and/or dilation of urethral stricture or stenosis, with or without meatotomy, male or female	3.0	7	3.0					
52290	with ureteral meatotomy	4.0	30	3.0	52610	control of post-operative bleeding during the hospitalization, complete	20.0	90	5.0
52300	with resection or fulguration of ureterocele, unilateral or bilateral	6.0	30	3.0		(For other approaches, see 55800-55840)			
52310	with removal of foreign body or calculus from urethra or bladder, simple	4.0	30	3.0	52620	two-stage resection (planned or medical necessity)	26.0	90	5.0
52315	complicated	BR+		3.0	52630	of residual obstructive tissue after 90 days post-operative .	6.0	90	5.0
52320	with removal of ureteral calculus	7.0	30	3.0	52640	of regrowth of obstructive tissue longer than one year post-operative	20.0	90	5.0
52330	with manipulation without removal of ureteral calculus	5.0	30	3.0	52650	of post-operative bladder neck contraction	10.0	90	5.0
52340	with incision, fulguration or resection of bladder neck and/or posterior urethra (e.g., congenital valves, obstructive hypertrophic mucosal folds)	6.0	30	3.0	52700	Transurethral cryosurgical removal of prostrate	20.0	120	5.0
52500	Transurethral resection of vesical neck, female or child	10.0	90	4.0	52800	Transurethral drainage of prostatic abscess	8.0	60	5.0
52600	Transurethral resection of prostate, including				53805	Litholapaxy: crushing of calculus in bladder and removal of fragments, simple, small (less than 2.5 cm)	10.0	30	3.0
						complicated or large (over 2.5 cm)	14.0	30	3.0

[Order 74-7, § 296-22-255, filed 1/30/74; Order 68-7, § 296-22-255, filed 11/27/68, effective 1/1/69.]

WAC 296-22-260 Urethra.

		Follow- Unit Value	up Days=	Basic Anes@		Follow- Unit Value	up Days=	Basic Anes@
	(For endoscopy, see cystoscopy, urethroscopy, cystourethroscopy, 52000-52805)				53265 urethral caruncle ...	1.2	15	3.0
					53270 Skene's glands.....	1.2	15	3.0
					53275 urethral prolapse....	3.0	30	3.0
	(For injection procedure for urethrocytography, see 51610)				Repair			
Incision					(For hypospadias, see 54300-54330)			
53000	Urethrotomy or urethrostomy, external (independent procedure), pendulous urethra	2.4	15	3.0	53400 Urethroplasty: first stage, for fistula, diverticulum or stricture (e.g., Johannsen type) .	10.0	60	3.0
53010	perineal urethra, external (independent procedure).....	6.0	30	3.0	53405 second stage (formation of urethra), including urinary diversion	14.0	60	3.0
53020	Meatotomy: cutting of meatus (independent procedure), except infant	1.0	15	3.0	53410 Urethroplasty: one stage reconstruction of male anterior urethra	16.0	60	3.0
53025	infant	0.6	15	3.0	53420 Urethroplasty: two stage reconstruction or repair of prostatic or membranous urethra, first stage	20.0	60	3.0
53040	Drainage of deep periurethral abscess ...	3.0	30	3.0	53425 second stage	20.0	90	3.0
	(For subcutaneous abscess, see 10060-10061)				53430 Urethroplasty: reconstruction of female urethra	14.0	90	3.0
53060	Drainage of Skene's gland abscess or cyst ..	1.2	15	3.0	53440 Operation for correction of male urinary incontinence, with or without introduction of prosthesis.....	20.0	90	3.0
53080	Drainage of perineal urinary extravasation, uncomplicated (independent procedure) ...	4.0	15	3.0	53450 Urethral meatoplasty, with mucosal advancement	4.0	30	3.0
53085	complicated	BR+		5.0	(For meatotomy, see 53020, 53025)			
Excision					Suture			
53200	Biopsy of urethra	2.0	7	3.0	53500 Urethrorrhaphy: suture of urethral wound or injury	BR+		3.0
53210	Urethrectomy, total, including cystostomy, female.....	14.0	60	5.0	53520 Closure of urethroscopy or urethrocutaneous fistula, male (independent procedure)	6.0	90	3.0
53215	male.....	18.0	60	5.0	(For closure of urethrovaginal fistula, see 57310)			
53220	Excision or fulguration of carcinoma of urethra	BR+		3.0	(For closure of urethrorectal fistula, see 45820, 45825)			
53230	Excision of urethral diverticulum, female (independent procedure) ..	10.0	60	3.0	Manipulation			
53235	male.....	12.0	60	3.0				
53240	Marsupialization of urethral diverticulum, male or female	4.0	30	3.0				
53260	Excision or fulguration, urethral polyp(s), distal urethra	1.0	15	3.0				
	(For endoscopic ap-							

		Follow-				Follow-			
		Unit	up	Basic		Unit	up	Basic	
		Value	Days=	Anes@		Value	Days=	Anes@	
*53600	Dilation of urethral stricture by passage of sound, male, initial	*0.4	0		54135	with bilateral inguinal and iliac lymphadenectomy	30.0	90	5.0
*53601	subsequent	*0.3	0			(For lymphadenectomy (independent procedure), see 38760-38766)			
*53620	Dilation of urethral stricture by passage of filiform and follower, male, initial	*0.8	0		54150	Circumcision, clamp procedure, newborn . . .	0.8	15	
*53621	subsequent	*0.6	0		54151	except newborn . . .	1.0	15	3.0
*53640	Passage of filiform and follower for acute vesical retention, male .	*0.8	0		54160	surgical excision other than clamp or dorsal slit, newborn	0.8	30	
*53660	Dilation of female urethra including suppository and/or instillation, initial	*0.4	0		54161	except newborn . . .	3.0	30	3.0
*53661	subsequent	*0.3	0			Introduction			

[Order 74-7, § 296-22-260, filed 1/30/74; Order 68-7, § 296-22-260, filed 11/27/68, effective 1/1/69.]

MALE GENITAL SYSTEM

WAC 296-22-265 Penis.

		Follow-				Follow-			
		Unit	up	Basic		Unit	up	Basic	
		Value	Days=	Anes@		Value	Days=	Anes@	
Incision									
54000	Dorsal or lateral slit of prepuce, newborn (independent procedure)	0.6	7		54300	Plastic operation of penis for straightening of chordee (e.g., hypospadias), with or without mobilization of urethra	8.0	60	3.0
54001	except newborn	1.4	7	3.0	54305	with transplantation of prepuce	14.0	60	3.0
Destruction									
*54050	Condylomata, multiple, simple, chemical	*0.3	0	3.0	54320	Urethroplasty: formation of urethra, Dennis Brown type procedure (including urinary diversion), penile or penoscrotal	14.0	90	3.0
*54055	electrodessication . . .	*0.8	0	3.0	54325	scrotal or perineal . . .	18.0	90	3.0
*54060	surgical excision	*1.0	0	3.0	54330	Urethroplasty and straightening of chordee (including urinary diversion), complete, one stage, for hypospadias	20.0	90	3.0
54065	extensive	BR+		3.0		(For other methods of hypospadias repair, see 15000-15730)			
(For destruction or excision of other lesions, see Integumentary System)									
Excision									
54100	Biopsy of penis, cutaneous (independent procedure)	0.6	7	3.0	54380	Plastic operation on penis for epispadias distal to external sphincter . . .	BR+		3.0
54105	deep structures	1.4	15	3.0	54385	with incontinence . . .	BR+		4.0
54120	Amputation of penis, partial	10.0	60	3.0	54390	with extrophy of bladder	BR+		4.0
54125	complete	20.0	60	3.0					
54130	radical, with bilateral superficial inguinal lymphadenectomy .	26.0	90	3.0					

		Follow- Unit up Value Days=	Basic Anes@
54400	Plastic operation for insertion of penile prosthesis	BR+	3.0
54420	Priapism operation (i.e., corpora cavernosa-saphenous vein shunt), unilateral or bilateral . .	BR+	3.0
54440	Plastic operation of penis for injury	BR+	3.0

[Order 74-7, § 296-22-265, filed 1/30/74; Order 68-7, § 296-22-265, filed 11/27/68, effective 1/1/69.]

WAC 296-22-270 Testis.

		Follow- Unit up Value Days=	Basic Anes@
Excision			
54500	Biopsy, needle (independent procedure) . . .	0.4 7	
54505	incisional, unilateral (independent procedure)	3.0 15	3.0
54506	bilateral (independent procedure) . . .	4.0 15	3.0
	(When combined with vasogram, seminal vesiculogram or epididymogram, see 55300)		
54510	Excision of local lesion of testis	6.0 30	3.0
54520	Orchiectomy, simple, (including subcapsular), with or without testicular prosthesis, scrotal or inguinal approach, unilateral	6.0 30	3.0
54521	bilateral	8.0 30	3.0
54530	Orchiectomy, radical, for tumor, inguinal approach	8.0 30	3.0
54535	with abdominal exploration	12.0 30	4.0
	(For orchiectomy with repair of hernia, see 49510)		
	(For radical retroperitoneal lymphadenectomy, see 38780)		
Repair			
54600	Reduction of torsion of testis by surgical means, with or without fixation of contralateral testis . .	8.0 30	3.0

		Follow- Unit up Value Days=	Basic Anes@
54620	Fixation of contralateral testis (independent procedure)	4.0 30	3.0
54640	Orchiopexy, any type, with or without hernia repair, unilateral	12.0 30	3.0
54645	second stage (Torek type)	2.0 30	3.0
54660	Insertion of testicular prosthesis, unilateral (independent procedure)	4.0 30	3.0
54670	Suture or repair of testicular injury	8.0 30	3.0

[Order 74-7, § 296-22-270, filed 1/30/74; Order 68-7, § 296-22-270, filed 11/27/68, effective 1/1/69.]

WAC 296-22-275 Epididymis.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
54700	Incision and drainage of epididymis, testis and/or scrotal space (e.g., abscess or hematoma)	1.4 7	3.0
Excision			
54800	Biopsy of epididymis, needle	0.4 7	
54820	Exploration of epididymis with or without biopsy	6.0 30	3.0
54830	Excision of local lesion of epididymis	6.0 30	3.0
54840	Excision of spermatocele with or without epididymectomy	8.0 45	3.0
	(With hernia repair, see 49515)		
54860	Epididymectomy, unilateral	8.0 45	3.0
54861	bilateral	10.0 45	3.0
Repair			
54900	Epididymovasostomy: anastomosis of epididymis to vas deferens, unilateral	10.0 90	3.0
54901	bilateral	14.0 90	3.0

[Order 74-7, § 296-22-275, filed 1/30/74; Order 68-7, § 296-22-275, filed 11/27/68, effective 1/1/69.]

WAC 296-22-280 Tunica vaginalis.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Incision				
*55000	Puncture aspiration of hydrocele with or without injection of medication	*0.48	0	
Excision				
55040	Excision of hydrocele, unilateral (With hernia repair, see 49515)	8.0	45	3.0
Repair				
55060	Repair of hydrocele (Bottle type)	6.0	45	3.0
[Order 74-7, § 296-22-280, filed 1/30/74; Order 68-7, § 296-22-280, filed 11/27/68, effective 1/1/69.]				

WAC 296-22-285 Scrotum.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Incision				
*55100	Drainage of scrotal wall abscess (see also 54700)	*0.4	0	3.0
55120	Removal of foreign body in scrotum	BR+		3.0
Excision				
	(For local excision of lesion of skin of scrotum, see Integumentary System)			
55150	Resection of scrotum	BR+		3.0
Repair				
55170	Scrotoplasty: plastic operation on scrotum	BR+		3.0
[Order 74-7, § 296-22-285, filed 1/30/74; Order 68-7, § 296-22-285, filed 11/27/68, effective 1/1/69.]				

Reviser's note: WAC 296-22-285 was originally adopted by Order 68-7, filed 11/27/68, effective 1/1/69. Order 74-7, filed 11/27/74 by the Department of Labor and Industries set forth this section as amended and repealed in the text of Order 74-7. The above codification is as submitted by this order.

WAC 296-22-290 Vas deferens.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Incision				
55200	Vasotomy: cannulization with or without incision of vas, unilateral or bilateral (independent procedure)	3.6	30	3.0
Excision				
55250	Vasectomy, unilateral or bilateral (independent procedure)	3.6	30	3.0
Introduction				
55300	Vasotomy for vasograms, seminal vesiculograms, or epididymograms, unilateral or bilateral	3.6	30	3.0
(When combined with 54505 or 54506, apply WAC 296-22-010, item 7a)				
(For radiographic procedure value, see 74440)				
Repair				
55400	Vasovasostomy, basovasorrhaphy, unilateral	10.0	90	3.0
55401	bilateral	14.0	90	3.0
Suture				
55450	Ligation (percutaneous) of vas deferens, unilateral or bilateral (independent procedure)	1.2	30	3.0
[Order 74-7, § 296-22-290, filed 1/30/74; Order 68-7, § 296-22-290, filed 11/27/68, effective 1/1/69.]				

WAC 296-22-295 Spermatic cord.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Excision				
55500	Excision of hydrocele of spermatic cord unilateral (independent procedure)	6.0	45	3.0
55520	Excision of lesion of spermatic cord (independent procedure)	6.0	30	3.0

		Follow-		Basic
	Unit	up	Days=	Anes@
	Value			
55530	Excision of varicocele or ligation of spermatic veins for varicocele (independent procedure) . .	8.0	45	3.0
55535	abdominal approach .	9.5	45	5.0
55540	with hernia repair . . .	9.5	45	3.0

[Order 74-7, § 296-22-295, filed 1/30/74; Order 68-7, § 296-22-295, filed 11/27/68, effective 1/1/69.]

WAC 296-22-300 Seminal vesicles.

	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	

Incision

55600	Vesiculotomy, unilateral or bilateral	BR+		5.0
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Excision

55650	Vesiculectomy, any approach, unilateral or bilateral	20.0	90	5.0
55680	Excision of Mullerian duct cyst	20.0	90	5.0

(For injection procedures, see 52010, 52110, 55300)

[Order 74-7, § 296-22-300, filed 1/30/74; Order 68-7, § 296-22-300, filed 11/27/68, effective 1/1/69.]

WAC 296-22-305 Prostate.

	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	

Incision

55700	Biopsy, prostate, needle or punch, single or multiple, any approach	1.4	15	3.0
55705	incisional, any approach	8.0	30	4.0
55720	Prostatotomy: external drainage of prostatic abscess, any approach, simple	8.0	60	4.0
55725	complicated	14.0	60	4.0

(For transurethral drainage, see 52700)

55740	Prostatolithotomy: removal of prostatic calculus (independent procedure)	20.0	60	4.0
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Excision

(For transurethral removal of prostate, see 52600-52650)

55800	Prostatectomy, perineal, subtotal	20.0	90	6.0
55810	radical	26.0	90	6.0
55820	suprapubic, one or two stages	20.0	90	5.0
55830	retropubic	20.0	90	5.0
55840	radical	26.0	90	6.0

[Order 74-7, § 296-22-305, filed 1/30/74; Order 68-7, § 296-22-305, filed 11/27/68, effective 1/1/69.]

FEMALE GENITAL SYSTEM

(For pelvic laparotomy, see 49000)

(For paracentesis, see 49080, 49081)

(For injection procedure for pelvic pneumography, see 49440)

(For secondary closure of abdominal wall evisceration or disruption, see 49900)

(For chemotherapy, see 96030-96050)

WAC 296-22-307 Perineum.

	Follow-		Basic
	Unit	up	Anes@
	Value	Days=	

Incision

*56000	Incision and drainage of perineal abscess (non-obstetrical) (see also 10060 et seq.)	*0.6	0	3.0
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Excision

56100	Biopsy of perineum (independent procedure) . .	0.6	7	3.0
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(For excision of local lesion, see 11400-11660, 13000-15760)

Repair

56200	Perineoplasty: repair of perineum (non-obstetrical) (independent procedure) (see also			
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		Follow-				Follow-		
		Unit	up	Basic		Unit	up	Basic
		Value	Days=	Anes@		Value	Days=	Anes@
56800)	BR+			3.0	of external genitalia, see 11400-11660, 13000-15760, 17000-17300)			
(For repair of recent injury of vagina and perineum, non-obstetrical, see 57210)					56620			
(For anal sphincteroplasty, see 46750, 46751)					56625	12.0	60	3.0
[Order 74-7, § 296-22-307, filed 1/30/74. Formerly WAC 296-22-335 (part).]					56630	15.0	60	3.0
					56635	20.0	120	3.0
WAC 296-22-310 Vulva and introitus.					56635			
					56636	24.0	120	5.0
					56640	26.0	120	5.0
Incision					56641	26.0	120	5.0
(For incision and drainage of sebaceous cyst, furuncle, or caruncle, see 10000-10020, 10060, 10061)						30.0	120	5.0
*56400	Incision and drainage, abscess of vulva, extensive	*0.8	0	3.0	(For lymphadenectomy, see 38760-38780)			
*56420	Incision and drainage of Bartholin's gland abscess, unilateral	*1.0	0	3.0	56660	1.0	30	3.0
(For incision and drainage of Skene's gland abscess or cyst, see 53060)					56680	8.0	30	3.0
					56685	12.0	90	3.0
56440	Marsupialization of Bartholin's gland cyst	4.0	30	3.0	56700			
Destruction					*56720	2.4	30	3.0
*56500	Condylomata, multiple, simple, chemical	*0.48	0	3.0	56740	*1.4	0	3.0
*56505	electrodessication	*0.8	0	3.0				
*56510	surgical excision	*1.0	0	3.0				
56515	extensive	BR+		3.0				
(For destruction of Skene's gland cyst or abscess, see 53270)								
(For cautery destruction of urethral caruncle, see 53265)								
Excision								
56600	Biopsy of vulva (independent procedure)	0.6	7	3.0				
(For local excision or fulguration of lesion(s))								

obstetrical), see 57210)
 [Order 74-7, § 296-22-310, filed 1/30/74; Order 68-7, § 296-22-310, filed 11/27/68, effective 1/1/69.]

WAC 296-22-315 Vagina.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
57000	Colpotomy with exploration or drainage of pelvic abscess	4.0	30 3.0
*57020	Colpocentesis (independent procedure)	*0.8	0 3.0
Excision			
57100	Biopsy of vaginal mucosa (independent procedure) (For excision and/or fulguration of local lesion(s), see 11200-11660, 17000-17300)	0.72	7 3.0
57110	Colpectomy: complete obliteration of vagina . .	14.0	60 3.0
57120	Colpoclesis (Le Fort type)	12.0	60 3.0
57130	Excision of vaginal septum	BR+	3.0
Introduction			
*57150	Irrigation and/or application of any medication for treatment of bacterial, parasitic or fungoid disease	*0.24	0
*57160	Insertion of pessary . . .	*0.24	0
Repair			
(For urethral suspension, (Marshall-Marchetti type) abdominal approach, see 51840)			
57200	Colporrhapy: suture of injury of vagina (non-obstetrical)	BR+	3.0
57210	Colpoperineorrhaphy: suture of injury of vagina and/or perineum (non-obstetrical)	BR+	3.0

		Follow- Unit up Value Days=	Basic Anes@
57220	Plastic operation on urethral sphincter, vaginal approach (independent procedure) . . .	7.0	60 3.0
57230	Plastic repair of urethrocele (independent procedure)	7.0	60 3.0
57240	Anterior colporrhaphy: repair of cystocele with or without repair of urethrocele (independent procedure)	8.5	60 4.0
57250	Posterior colporrhaphy: repair of rectocele (independent procedure) . .	7.0	60 3.0
57255	with perineoplasty or perineorrhaphy	8.0	60 3.0
57260	Combined anterior-posterior colporrhaphy .	12.0	60 3.0
57265	with enterocele repair	14.0	60 3.0
57267	with Manchester type repair	14.0	60 3.0
57270	Repair of enterocele, abdominal approach (independent procedure)	14.0	60 4.0
57280	Colpopexy, abdominal approach	14.0	60 4.0
57290	Construction of artificial vagina (vaginal atresia or absence) . . .	BR+	3.0
57300	Closure of rectovaginal fistula, vaginal approach	14.5	90 3.0
57305	abdominal approach .	18.0	90 5.0
57307	with concomitant colostomy	20.0	90 5.0
57310	Closure of urethrovaginal fistula . .	14.5	60 4.0
57320	Closure of vesicovaginal fistula, vaginal approach	14.5	60 4.0
(For concomitant cystostomy, see 51005-51040 and WAC 296-22-010, item 7a)			
57220	transvesical and vaginal approach	BR+	5.0
(For abdominal approach, see 51900)			
Manipulation			
*57400	Dilation of vagina under anesthesia	*0.72	0 3.0
*57410	Pelvic examination under anesthesia	*0.72	0 3.0

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Endoscopy				
57450	Culdoscopy, with or without biopsy (independent procedure) . . .	4.0	15	3.0
[Order 74-7, § 296-22-315, filed 1/30/74; Order 68-7, § 296-22-315, filed 11/27/68, effective 1/1/69.]				

WAC 296-22-325 Cervix uteri.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Excision				
	(For radical surgical procedures, see 58200-58240)			
*57500	Biopsy or local excision of lesion, with or without fulguration, quadrant biopsy (independent procedure)	*0.6	0	3.0
*57510	Cauterization of cervix, electro or thermal, office	*0.6	0	
57520	Biopsy of cervix, circumferential (cone) with or without dilation and curetage, with or without Sturmdorff type repair (see also 58120)	4.8	45	3.0
57530	Trachelectomy: cervicectomy: amputation of cervix (independent procedure)	4.8	45	3.0
57540	Excision of cervical stump, abdominal approach	12.0	45	4.0
57545	with pelvic floor repair	BR+		4.0
57550	vaginal approach	12.0	45	3.0
57555	with anterior and/or posterior repair	14.5	45	3.0

Introduction

(For insertion of any radioactive material, see 77520-77550)

(For insertion of intra-uterine device, see 58300)

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
*57600	Insertion of any hemostatic agent or pack for spontaneous hemorrhage (independent procedure), initial	*0.72	0	3.0
*57620	subsequent	*0.24	0	3.0
Repair				
57700	Tracheloplasty (Shirodkar or Lash type procedure)	6.0	45	3.0
57720	Trachelorrhaphy: plastic repair of uterine cervix, vaginal approach . .	6.0	45	3.0
Manipulation				
*57800	Dilation of cervical canal, instrumental (independent procedure) .	*0.6	0	3.0
57820	Dilation and curettage of cervical stump	4.0	15	3.0
[Order 74-7, § 296-22-325, filed 1/30/74; Order 68-7, § 296-22-325, filed 11/27/68, effective 1/1/69.]				

WAC 296-22-330 Corpus uteri.

		Follow-		
		Unit	up	Basic
		Value	Days=	Anes@
Excision				
*58100	Endometrial biopsy, suction type (independent procedure)	*0.72	0	3.0
58120	Dilation and curettage, diagnostic and/or therapeutic—(non-obstetrical) (see also 57520) . .	4.0	15	3.0
58140	Myomectomy: single or multiple, excision of fibroid tumor of uterus, abdominal approach (independent procedure)	14.0	45	5.0
58145	vaginal approach	BR+		5.0
58150	Total hysterectomy (corpus and cervix) with or without tubes, and/or ovaries, one or both	16.0	45	5.0
58180	Supracervical hysterectomy: subtotal hysterectomy, with or without tubes, and/or ovaries, one or both	16.0	45	5.0
58200	Total hysterectomy, extended, corpus cancer, including partial vaginectomy	20.0	120	5.0

		Unit Value	Follow-up Days=	Basic Anes@
58205	with pelvic lymphadenectomy	24.0	120	6.0
58210	cervical cancer, with radical lymphadenectomy (Wertheim type operation)	30.0	120	7.0
58240	Total hysterectomy or cervicectomy with removal of bladder and ureteral transplantations, and/or abdomino-perineal resection of rectum and colon and colostomy, or any combination thereof (pelvic exenteration) BR+			7.0
58260	Vaginal hysterectomy . .	16.0	45	4.0
58265	with plastic repair of vagina, anterior and/or posterior colporrhaphy	18.0	45	4.0
58270	with repair of enterocele	18.0	45	4.0
58275	with total or partial colpectomy	18.0	45	4.0
58280	with repair of enterocele	18.0	45	4.0
58285	radical (Schauta type procedure)	24.0	120	7.0

Introduction

(For insertion of radioactive substance into corpus with or without dilation and curettage, see 77520-77550)

*58300	Insertion of intro-uterine device (IUD)	*1.0	0	3.0
*58320	Insufflation of uterus and tubes with air and CO ₂	*1.0	0	3.0
58340	Injection procedure for hysterosalpingography . .	0.8	0	

Repair

58400	Uterine suspension with or without shortening of round ligaments with or without shortening of sacrouterine ligaments (independent procedure)	12.0	45	4.0
58410	with presacral sympathectomy	14.0	45	5.0

		Unit Value	Follow-up Days=	Basic Anes@
58430	Interposition operation (Watkins type procedure), with or without pelvic floor repair	14.0	45	4.0
	(For Manchester type repair, see 57267)			
58500	Hysterosalpingostomy: anastomosis of tube(s) to uterus	14.0	45	4.0
58520	Hysterorrhaphy: repair of ruptured uterus (non-obstetrical)	12.0	45	4.0
58540	Hysteroplasty: repair of uterine anomaly (Strassman type)	14.0	45	4.0

Suture

(For closure of vesicouterine fistula, see 51920)

[Order 74-7, § 296-22-330, filed 1/30/74; Order 68-7, § 296-22-330, filed 11/27/68, effective 1/1/69.]

WAC 296-22-333 Oviduct.

		Unit Value	Follow-up Days=	Basic Anes@
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Incision

58600	Transection of fallopian tube, unilateral or bilateral, abdominal or vaginal approach	12.0	45	4.0
58605	postpartum, during same hospitalization (independent procedure)	7.0	45	4.0

Excision

58700	Salpingectomy, complete or partial, unilateral or bilateral (independent procedure)	12.0	45	4.0
58720	Salpingo-oophorectomy, complete or partial, unilateral or bilateral (independent procedure)	12.0	45	4.0
58740	Salpingoplasty, unilateral or bilateral (independent procedure) . . .	14.0	45	4.0

[Order 74-7, § 296-22-333, filed 1/30/74.]

WAC 296-22-337 Ovary.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
58800	Drainage of ovarian cyst(s), unilateral or bilateral, vaginal approach	4.0	15 4.0
58805	abdominal approach	12.0	45 4.0
58820	Drainage of ovarian abscess, vaginal approach	4.0	15 4.0
Excision			
58900	Biopsy of ovary, unilateral or bilateral (independent procedure)	12.0	45 4.0
58920	Wedge resection or bisection of ovary, unilateral or bilateral	12.0	45 4.0
58940	Oophorectomy, unilateral or bilateral, partial or total	12.0	45 4.0
58945	with total omentectomy	16.0	60 4.0

[Order 74-7, § 296-22-337, filed 1/30/74. Formerly WAC 296-22-320.]

MATERNITY CARE AND DELIVERY

WAC 296-22-340 General information and instructions.

Total maternity care includes antepartum care, delivery and postpartum care. The listed values include the services normally provided in uncomplicated maternity care. (For multiple pregnancies, see WAC 296-20-010, item 10 and modifier -22.)

Antepartum care includes usual prenatal services (e.g., initial and subsequent history, physical examinations, recording of weight, blood pressure, fetal heart tones, routine chemical urinalyses, maternity counseling).

Delivery includes vaginal delivery (with or without episiorrhaphy, with or without forceps) or Cesarean section, and resuscitation of new born infant when necessary.

Postpartum care includes hospital and office visits following vaginal or Cesarean section delivery.

For medical complications of pregnancy (e.g., toxemia, cardiac problems, neurological problems) or other problems requiring additional or unusual services or requiring hospitalization, see appropriate services in Medicine. (For surgical complications of pregnancy not listed below, see appropriate procedures in Surgery section, WAC 296-22010, item 1-4 and modifier -68.)

If a physician provides all or part of the antepartum and/or postpartum care of a patient, but does not perform the delivery due to termination of pregnancy by

abortion or referral to another physician for delivery, see 59420-59430.

(For obstetrical anesthesia provided by the attending physician, see modifier -47.)

		Follow- Unit up Value Days=	Basic Anes@
Incision			
59000	Amniocentesis for diagnostic purposes, abdominal approach	1.0	0
Excision			
59100	Hysterotomy, abdominal, for removal of hydatidiform mole	14.0	45 5.0
59120	Ectopic pregnancy, tubal, requiring salpingectomy and/or oophorectomy, abdominal or vaginal approach	14.0	45 5.0
59125	ovarian, requiring oophorectomy and/or salpingectomy	BR+	5.0
59130	abdominal	BR+	5.0
59135	interstitial, uterine pregnancy requiring hysterectomy, total or subtotal	BR+	5.0
59140	cervical	BR+	5.0
59160	Dilation and curettage for postpartum hemorrhage (independent procedure)	4.0	15 3.0
Introduction			
(For intrauterine fetal transfusion, see 36460)			
59240	Introduction of hypertonic solution to initiate labor, abdominal approach	2.0	0
Repair			
59300	Episiotomy or vaginal repair only, by other than delivering physician, simple	2.0	0 3.0
59305	extensive	BR+	3.0
(For perineorrhaphy only, by other than delivering physician, see 57210)			
Delivery, Antepartum and Postpartum Care			
59400	Total obstetrical care including antepartum		

Surgical Fees

296-22-350

	Follow- Unit up Value Days=	Basic Anes@
care, vaginal delivery and postpartum care (with or without low forceps and/or episiotomy)	8.0 45	3.0
59410 Vaginal delivery only (with or without forceps and/or episiotomy) . . .	4.0 45	3.0
59420 Antepartum care only (independent procedure)	Sv.&	
59430 Postpartum care only (independent procedure)	Sv.&	

	Follow- Unit up Value Days=	Basic Anes@
surgically	Sv.&	3.0
59830 Septic	Sv.&	
59850 Therapeutic, by dilation and curettage (including suction curettage) . .	6.0 45	3.0
59860 by introduction of hypertonic solution, transabdominal approach	6.0 45	5.0

[Order 74-7, § 296-22-340, filed 1/30/74; Order 68-7, § 296-22-340, filed 11/27/68, effective 1/1/69.]

Cesarean Section

(For standby attendance of infant, see 99040)

59500 Low cervical (independent procedure)	10.0 7	5.0
59501 including antepartum and postpartum care .	13.0 45	5.0
59520 Classic (independent procedure)	10.0 7	5.0
59521 including antepartum and postpartum care .	13.0 45	5.0
59540 Extraperitoneal (independent procedure) . . .	12.0 7	5.0
59541 including antepartum and postpartum care .	16.0 45	5.0
59560 Cesarean section with hysterectomy, subtotal (independent procedure)	12.0 7	6.0
59561 including antepartum and postpartum care . .	16.0 45	6.0
59580 total (independent procedure)	12.0 7	6.0
59581 including antepartum and postpartum care . .	16.0 45	6.0

Abortion

59800 Abortion, first trimester, completed medically	Sv.&	
59801 completed surgically	4.0 45	3.0
59810 second trimester, completed medically .	Sv.&	
59811 completed surgically	4.0 45	3.0
59820 Missed, any trimester, completed medically or		

ENDOCRINE SYSTEM

(For pituitary and pineal surgery, see Nervous system)

WAC 296-22-350 Thyroid gland.

	Follow- Unit up Value Days=	Basic Anes@
Incision		
*60000 Incision and drainage of thyroglossal cyst, infected	*0.6 0	3.0
Excision		
60100 Biopsy, needle	1.2 7	
60200 Local excision of small cyst or adenoma of thyroid, or transection of isthmus	9.5 45	5.0
60220 Total thyroid lobectomy, unilateral	14.0 45	5.0
60240 Thyroidectomy, total or complete	16.0 45	5.0
60245 subtotal or partial	14.5 45	5.0
60250 total or subtotal for malignancy with radical neck dissection . .	28.0 180	6.0
60255 with limited neck dissection	24.0 180	5.0
60260 secondary, unilateral	15.0 45	5.0
60261 bilateral	18.0 45	5.0
60270 Thyroidectomy, substernal, sternal split or transthoracic approach	BR+	
60280 Excision of thyroglossal duct cyst or sinus	11.0 45	4.0

[Order 74-7, § 296-22-350, filed 1/30/74; Order 68-7, § 296-22-350, filed 11/27/68, effective 1/1/69.]

WAC 296-22-355 Parathyroid, thymus, adrenal glands and carotid body.

		Follow-			Follow-				
		Unit	up	Basic	Unit	up	Basic		
		Value	Days=	Anes@	Value	Days=	Anes@		
Excision									
60500	Parathyroidectomy or exploration of parathyroid(s)	18.0	45	5.0	61030	with injection procedure for positive contrast ventriculography or CSF flow study, including lumbar puncture for recovery of contrast material.	5.6	7	7.0
60505	with mediastinal exploration, sternal split or transthoracic approach	24.0	60	12.0	*61050	Cisternal puncture (independent procedure)	*1.8	0	
60520	Thymectomy, partial or total (independent procedure)	18.0	60	12.0		Craniotomy by Burr Hole or Trepine			
60540	Adrenalectomy, partial or complete, or exploration of adrenal with or without biopsy, transabdominal, lumbar or dorsal (independent procedure), unilateral	19.0	90	9.0	61100	Burr hole(s), subdural exploratory, not followed by other surgery, unilateral	13.0	30	8.0
60545	with excision of adjacent retroperitoneal tumor	22.0	90	9.0	61101	bilateral	18.0	30	8.0
60550	bilateral, one stage	24.0	90	9.0		(If followed by craniotomy at same operative session, use 61300-61340; do not use 61100, 61101)			
60555	two stages	BR+		9.0	61120	Burr hole(s) for ventricular puncture (including injection of air or contrast media), not followed by other surgery	10.0	30	7.0
60600	Excision of carotid body tumor, without excision of carotid artery	17.0	60	8.0	61130	when followed by other surgery	7.0	0	
60605	with excision of carotid artery	24.0	60	8.0	61150	Burr hole(s) for drainage of brain abscess	24.0	90	9.0
	[Order 74-7, § 296-22-355, filed 1/30/74; Order 68-7, § 296-22-355, filed 11/27/68, effective 1/1/69.]				61151	subsequent tapping (aspiration) of abscess in operating room or bedside	2.0	0	4.0

NERVOUS SYSTEM

WAC 296-22-365 Skull, meninges and brain.

		Follow-			Follow-				
		Unit	up	Basic	Unit	up	Basic		
		Value	Days=	Anes@	Value	Days=	Anes@		
Incision									
*61000	Subdural tap through fontanelle (infant), initial, unilateral or bilateral	*2.0	0		61300	Exploratory, supratentorial	34.0	90	9.0
*61001	subsequent taps, unilateral or bilateral	*1.4	0		61305	infratentorial (suboccipital)	40.0	90	10.0
*61020	Ventricular puncture through previous burr hole or fontanelle	*2.0	0		61310	Evacuation of hematoma, extradural, subdural, or intracerebral	28.0	90	13.0
61025	with injection procedure for ventriculography	5.0	7	7.0	61320	Drainage of abscess	28.0	90	11.0
					61330	Orbital decompression, unilateral	26.0	90	9.0
					61340	Other cranial decompression (e.g.,			

	Unit Value	Follow-up Days=	Basic Anes@		Unit Value	Follow-up Days=	Basic Anes@
61350	16.0	90	9.0	61640	30.0	90	11.0
61360	28.0	90	10.0	61660	34.0	90	10.0
61370	34.0	90	10.0	61665	BR+		4.0
61380	40.0	90	11.0	61800	38.0	90	8.0
61400	24.0	90	9.0	61810	38.0	90	8.0
	34.0	90	11.0	61820	38.0	90	8.0
Excision or Destruction				61830	32.0	90	4.0
Trephine, Craniectomy or Bone Flap Craniotomy				61890	BR+		8.0
(For sequestrectomy for osteomyelitis, see 21020)				Introduction			
61500	BR+		8.0	(For injection procedure for cerebral angiography, see 36100-36120, 36210, 36220)			
61510	34.0	90	12.0	(For ventriculography, see 61025, 61030, 61120, 61130)			
61515	40.0	90	11.0	61900	3.6	7	5.0
61520	40.0	90	11.0	(See WAC 296-22-010, item 2)			
61540	BR+		13.0	Repair			
61560	40.0	90	13.0	62000	18.0	90	9.0
61565	BR+		7.0	62005	24.0	90	9.0
61580	BR+		9.0	62010	29.0	90	11.0
61585	BR+		9.0	62100	30.0	90	9.0
61600	38.0	90	9.0	62120	BR+		9.0
61610	38.0	90	9.0	62140	20.0	90	9.0
61620	48.0	90	9.0	62141	BR+		9.0

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
62145	with reparative brain surgery	BR+		11.0	63005	lumbar	26.0	90	7.0
62160	Craniectomy for craniostenosis, single suture	24.0	90	9.0	63010	for spondylolisthesis (Gill type procedure)	28.0	90	7.0
62161	multiple sutures	30.0	90	9.0	63015	extensive, any level . .	BR+		Cervical 8.0 Other 7.0
62180	Ventriculocisternostomy (Torkildsen)	32.0	90	11.0					
62200	Third ventriculocisternostomy	32.0	90	11.0					
62220	Ventriculo-auricular shunt	26.0	90	11.0		(When combined with arthrodesis, see 22550-22565)			
62225	replacement or irrigation of ventricular catheter	10.0	90	5.0	63050	Cervical laminectomy and section of dentate ligaments, with or without dural graft	38.0	90	8.0
62230	replacement or irrigation of obstructed valve or auricular catheter	20.0	90	11.0	63100	Rhizotomy, one or two segments	28.0	90	8.0
62235	replacement of entire system	26.0	90	11.0	63105	extensive	BR+		8.0
62240	removal of complete system without replacement	10.0	90	11.0	63140	Cordotomy, cervical or thoracic, bilateral or unilateral, one stage	32.0	90	Cervical 8.0 Thoracic 7.0
62300	Ventriculo-peritoneal-pleural-ureteral-fallopian or other shunt	26.0	90	11.0	63145	two stages, within fourteen days	40.0	90	Cervical 8.0 Thoracic 7.0
62305	co-surgeon for shunt placement	13.0	90						
[Order 74-7, § 296-22-365, filed 1/30/74; Order 68-7, § 296-22-365, filed 11/27/68, effective 1/1/69.]									
WAC 296-22-370 Spine and spinal cord.									
		Follow-							
		Unit	up	Basic					
		Value	Days=	Anes@					
	(For application of caliper or tongs, see 20660.)				63160	Stereotactic lesion of spinal cord, percutaneous, any modality	24.0	90	
	(For open reduction of fracture dislocation of spine, see 22325-22370.)				*63200	Spinal puncture, lumbar, simple	*0.6	0	
					*63205	diagnostic, including hydrodynamics	*1.0	0	
					Excision				
					63300	Laminectomy, one or two segments, for intraspinal lesion, cervical or thoracic	34.0	90	Cervical 8.0 Thoracic 7.0
Incision					63305	lumbar	30.0	90	7.0
63000	Laminectomy, one or two segments, for decompression of spinal cord and/or nerve roots, cervical or thoracic	32.0	90	Cervical 8.0 Thoracic 7.0	63310	extensive, any level . .	BR+		Cervical 8.0 Other 7.0

Surgical Fees

296-22-375

		Follow-up Unit Value Days=	Basic Anes@			Follow-up Unit Value Days=	Basic Anes@
(When combined with arthrodesis, see 22550-22565)				63720	Repair of meningocele	24.0	90 9.0
63400 Laminotomy, one or two segments, for herniated intervertebral disc(s), and/or decompression of nerve root(s), unilateral, cervical or thoracic	26.0	90	Cervical 8.0 Thoracic 7.0		(For complex skin closure, see Integumentary System, 14000-15710)		
				63740	Lumbar subarachnoid-peritoneal-pleural-urteral-fallopian or other shunt	26.0	90 9.0
				63745	co-surgeon for shunt placement	13.0	90
63402 thoracic, costovertebral approach	32.0	90	9.0	[Order 74-7, § 296-22-370, filed 1/30/74; Order 68-7, § 296-22-370, filed 11/27/68, effective 1/1/69.]			
63405 lumbar	24.0	90	7.0	WAC 296-22-375 Extracranial nerves, peripheral nerves and autonomic nervous system.			
63410 any level, bilateral, add.	6.0	90					
63415 any level, extensive or re-exploration	BR+		Cervical 8.0 Other 7.0				
					Incision		
					Transection or Avulsion of Nerve		
(For anterior approach or for combination with arthrodesis, see 22550-22565)					(For intracranial surgery on cranial nerves, see 61350, 61360)		
Introduction				64000	Supraorbital	7.0	30 3.0
(For injection procedure for pneumoencephalography, see 61900)				64010	Infraorbital	7.0	30 3.0
63500 Injection, neurolytic substance (e.g., alcohol, phenol), subarachnoid	BR+			64020	Mental	7.0	30 3.0
63505 extradural (epidural)	BR+			64030	Inferior alveolar by osteotomy	10.0	30 3.0
63510 Injection procedure for myelography, lumbar	2.4	7	3.0	64040	Facial, differential or complete	BR+	3.0
63515 cervical	2.4	7	3.0	64050	Greater occipital	7.0	30 3.0
63520 posterior fossa	2.4	7	3.0	64060	Phrenic	5.0	30 3.0
(See WAC 296-22-010, item 2)				64070	Vagus (vagotomy), cervical	7.0	30 3.0
63530 Injection procedure for discography, single or multiple levels, lumbar	3.2	0	3.0	64071	transthoracic	14.0	45 11.0
63535 cervical	3.2	0	3.0	64072	abdominal	14.0	45 6.0
63540 Chemolysis one or more disc levels					(For vagotomy combined with gastric procedures, see 43635, 43640, 43825, 43855, 43865)		
Repair				64080	Obturator, extrapelvic, with or without adductor tenotomy, unilateral	6.0	45 3.0
63700 Repair of meningocele	20.0	90	9.0	64081	bilateral	9.0	45 3.0
				64085	intrapelvic, unilateral	10.0	60 4.0
				64086	bilateral	13.0	60 4.0
				64090	Other spinal nerve, extradural	BR+	3.0

		Follow-- Unit up Basic Value Days= Anes@					Follow-- Unit up Basic Value Days= Anes@		
Excision				Introduction (Independent Procedure)					
(For excision of tender scar, skin and subcutaneous tissues with or without tiny neuroma, see 11400-11460, 13000-13300)				Nerve Block					
(For neurectomy, intrinsic musculature foot, see 28030)				Anesthetic Agent (diagnostic or therapeutic)					
(For Morton's neurectomy, see 28080)				(For anesthesia services in conjunction with surgical procedures, see Anesthesia section)					
(For popliteal neurectomy, see 27320)				Somatic					
64200	Neuroma, cutaneous nerve, surgically identifiable	3.0	30	3.0	64400	Trigeminal, any division or branch	0.6	0	
64205	digital nerve, one or both, same digit	3.0	30	3.0	64405	Greater occipital	0.6	0	
64210	hand or foot	6.0	30	3.0	64410	Phrenic	0.8	0	
64215	major peripheral nerve	10.0	30	3.0	64415	Brachial plexus	1.0	0	
64220	each additional nerve (except same digit): list separately by this number and value at 25% of the listed value for the appropriate nerve				64420	Intercostal	0.72	0	
64240	Neurofibroma or neurilemmoma, cutaneous nerve	6.0	30	3.0	64425	Ilioinguinal, iliohypogastric	0.72	0	
64245	major peripheral nerve	BR+		3.0	64430	Pudendal	1.0	0	
64250	extensive (including malignant type)	BR+		3.0	64435	Paracervical (uterine)	1.0	0	
Surgical Sympathectomy				Thoracic, lumbar, sacral, coccygeal (paravertebral)					
64300	Cervical, unilateral	14.5	60	6.0	64440	Sciatic	1.0	0	
64301	bilateral	19.0	60	6.0	64445	Other peripheral nerve or branch	0.6	0	
64320	Cervico-thoracic, unilateral, one stage	20.0	60	6.0	64450	Myoneural junction, diagnostic block	0.6	0	
64321	bilateral or two stage unilateral	28.0	60	8.0	64455	(For phenol equivalent, see 64650)	0.8	0	
64330	Thoraco-lumbar, unilateral	20.0	60	6.0	64460	Subarachnoid or subdural (spinal), simple	1.0	0	
64331	bilateral	28.0	60	8.0	64465	differential	BR+		
64340	Hypogastric or presacral neurectomy (independent procedure)	14.0	60	5.0	64470	Epidural, caudal or other level	1.0	0	
64350	Lumbar, unilateral	15.0	60	5.0	Sympathetic				
64351	bilateral	21.0	60	5.0	64510	Stellate ganglion (cervical sympathetic)	1.0	0	
				64520 Lumbar or thoracic (paravertebral sympathetic)					
				Neurolytic Agent (alcohol, phenol, etc.)					
				64600 Trigeminal: supraorbital, infraorbital, mental, or inferior alveolar branch					
				64605 2nd and 3rd division of foramen ovale					

		Follow- Unit up Value Days=	Basic Anes@
64610	under X-ray control	4.0	30
64620	Intercostal	1.4	7
64630	Pudendal	BR+	
64640	Other peripheral nerve or branch	BR+	
64650	Myoneural junction (phenol equivalent) . . .	1.8	7

Repair

Neurorrhaphy—Suture of Nerve

64700	Microdissection and/or microrepair of nerve: list separately from the nerve repair using this number and value at 50% of the listed value of the nerve repair as an additional charge		
64705	Digital (hand or foot), one nerve	4.8	90
64706	for each additional digit nerve, add	1.2	
64710	Hand or foot, common sensory nerve	8.0	90
64715	median motor thenar	10.0	90
64720	ulnar motor	12.0	90
64725	other	8.0	3.0
64730	Arm or leg (except sciatic)	12.0	90
64735	Sciatic	BR+	3.0
64740	Brachial or lumbar plexus	BR+	3.0
64750	Facial, extracranial	BR+	3.0
64755	Facial anastomosis with other cranial nerve (spinal accessory-facial, hypoglossal-facial, phrenic-facial, etc.) . . .	26.0	90
64770	Secondary or delayed suture: list separately from neurorrhaphy by this number and value at 25% of the listed value of the primary neurorrhaphy as an additional charge		
64780	Requiring mobilization, repositioning or free nerve graft, any nerve . . .	BR+	3.0

Neuroplasty—Decompression or freeing of scar tissue from intact nerve, including external neurolysis and transplantation

(For facial nerve decompression, see 69720, 69740)

		Follow- Unit up Value Days=	Basic Anes@
64900	Digital, one or both, same digit	4.8	90
64910	Hand or foot	8.0	90
64920	Arm, radial	12.0	90
64925	ulnar at elbow	12.0	90
64930	median at carpal tunnel	8.0	90
64935	Leg, sciatic	BR+	3.0
64940	posterior tibial at tarsal tunnel	8.0	90
64945	Other	BR+	3.0
64950	Brachial or lumbar plexus	BR+	3.0
64960	Internal lysis by dissection, with or without microdissection: list separately from neuroplasty by this number and value at 50% of the listed value of the primary neuroplasty as an additional charge		

[Order 74-7, § 296-22-375, filed 1/30/74; Order 68-7, § 296-22-375, filed 11/27/68, effective 1/1/69.]

EYE

(For diagnostic eye examination, see 92000-92300)

WAC 296-22-405 Eyeball.

		Follow- Unit up Value Days=	Basic Anes@
	Incision		
	(For goniotomy, see 65820)		
	Excision		
65100	Enucleation of eye, with or without sphere implant	10.0	30
65105	with integrated implant	12.0	30
65140	Secondary insertion of integrated implant	14.0	30
65160	Evisceration of eye	10.0	30
65165	with implantation in scleral shell	12.0	30
	Repair		
65200	Suture of eye for wound or injury	BR+	3.0

[Order 74-7, § 296-22-405, filed 1/30/74; Order 68-7, § 296-22-405, filed 11/27/68, effective 1/1/69.]

WAC 296-22-410 Cornea.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
65300	Keratotomy, any type	2.0 15	3.0
	(For paracentesis of cornea, see 65840)		
*65320	Removal of imbedded foreign body	*0.4 0	3.0
*65325	under slit lamp	*0.6 0	
Excision			
65400	Keratectomy, lamellar, partial	8.0 30	3.0
65405	complete	10.0 30	3.0
65420	Pterygium, simple	6.0 30	3.0
65425	complicated	BR+ 3.0	
*65440	Curettage and cauterization of corneal ulcer	*1.0 0	3.0
Introduction			
65600	Tattoo of cornea, mechanical or chemical	8.0 30	3.0
Repair			
65700	Keratoplasty (corneal transplant), lamellar	24.0 90	8.0
65705	penetrating	30.0 90	8.0
	(For lacerated cornea, see 65200)		

[Order 74-7, § 296-22-410, filed 1/30/74; Order 68-7, § 296-22-410, filed 11/27/68, effective 1/1/69.]

WAC 296-22-413 Anterior chamber.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
*65800	Aspiration of aqueous, diagnostic (e.g., protein analysis)	*1.0 0	3.0
65810	Aspiration of vitreal prolapse, with or without air injection	8.0 90	3.0
65820	Goniotomy	10.0 30	3.0
65840	Paracentesis	2.0 15	3.0
65860	Removal of intraocular foreign body, anterior chamber	12.0 45	6.0

Follow-
Unit up
Value Days= Basic
Anes@

65880	Severing (lysis) corneo-vitreous adhesions	BR+		3.0
Excision				
65900	Removal of epithelial down-growth	BR+		6.0
Introduction				
66000	Irrigation of blood from anterior chamber (independent procedure)	5.0 15		3.0
66020	Air injection into anterior chamber (independent procedure)	2.0 7		3.0

[Order 74-7, § 296-22-413, filed 1/30/74. Formerly WAC 296-22-405 (part) and WAC 296-22-415.]

WAC 296-22-415 Sclera.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
66100	Sclerotomy, posterior, with removal of intraocular foreign body by magnetic extraction	12.0 45	6.0
66105	by non-magnetic extraction	16.0 45	8.0
66120	Sclerotomy, posterior, with or without drainage of fluid (independent procedure)	8.0 15	3.0
Excision			
66200	Sclerectomy for glaucoma, with scissors, punch, trephine or cautery	12.0 45	6.0
66220	Scleral resection, any type (independent procedure)	20.0 90	6.0
66225	with graft	24.0 90	6.0
Repair			
	(For scleral reinforcement, see 66220, 66225)		
Suture			
	(For suture of sclera for wound or injury, see 65200)		

[Order 74-7, § 296-22-415, filed 1/30/74; Order 68-7, § 296-22-415, filed 11/27/68, effective 1/1/69.]

WAC 296-22-420 Iris and ciliary body.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
66500	Iridotomy (independent procedure)	5.0 30	3.0
66505	with transfixation of iris (e.g., iris bombe) (independent procedure) (see also 66760)	5.0 30	3.0
Excision			
66600	Excision of lesion of iris	14.0 45	3.0
66605	and/or ciliary body (iridocyclectomy)	20.0 45	3.0
66620	Iridectomy, any type (independent procedure)	10.0 45	3.0
66640	Iridencleisis or comparable procedure, with or without sclerectomy	12.0 45	3.0
Repair			
66680	Iridodialysis (For repair of prolapsed iris with suture of lacerated sclera or cornea, see 65200)	10.0 45	3.0
Destruction			
66700	Cyclodiathermy, initial	8.0 30	3.0
66701	subsequent	4.0 30	3.0
66720	Cyclocryotherapy, initial	6.0 30	3.0
66721	subsequent	3.0 30	3.0
66740	Cyclodialysis, initial	12.0 45	3.0
66741	subsequent	6.0 45	3.0
66760	Iridotomy, performed by photocoagulator or laser (see also 66500-66505)	5.0 30	3.0

[Order 74-7, § 296-22-420, filed 1/30/74; Order 68-7, § 296-22-420, filed 11/27/68, effective 1/1/69.]

WAC 296-22-425 Crystalline lens.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
66800	Discission (needling of lens), initial	5.0 45	3.0
66801	subsequent	2.4 45	3.0
66820	secondary membrane, simple	5.0 45	3.0
66825	complicated (e.g.,		

Follow-
Unit up
Value Days= Basic
Anes@

66840	with scissors) Aspiration of lens material for cataract, one or more stages	8.0 45	3.0
Excision			
66900	Extraction of lens, unilateral (e.g., cataract, dislocated lens)	20.0 90	8.0

[Order 74-7, § 296-22-425, filed 1/30/74; Order 68-7, § 296-22-425, filed 11/27/68, effective 1/1/69.]

WAC 296-22-427 Vitreous.

		Follow- Unit up Value Days=	Basic Anes@
Introduction			
67000	Transplantation of vitreous, including sclerotomy	12.0 60	8.0
67020	Discission of anterior hyaloid, (e.g., pupillary block) (For aspiration of vitreous, see 66120) (For removal of foreign body, see 65860, 66100, 66105)	5.0 45	3.0

[Order 74-7, § 296-22-427, filed 1/30/74. Formerly WAC 296-22-425 (part).]

WAC 296-22-430 Retina.

		Follow- Unit up Value Days=	Basic Anes@
Repair			
67100	Reattachment, retinopexy, with or without drainage of subretinal fluid (e.g., diathermy and/or cryotherapy), initial	20.0 90	3.0
67101	subsequent	BR+	3.0
67105	with scleral buckling, scleral resection, encircling tube and/or scleral implant, initial	30.0 90	8.0
67110	subsequent	BR+	8.0
67120	Removal of encircling tube	BR+	3.0
67140	Repair of retinal break(s) or schisis, one		

		Follow- Unit up Value Days=	Basic Anes@
or more stages during same period of hospitalization, photocoagulation and/or cryotherapy ...	10.0	30	3.0
Destruction			
67200 Photocoagulation, for tumor, Eales disease, etc., initial.....	10.0	30	3.0
67201 subsequent.....	5.0	20	3.0
67220 Diathermy or cryotherapy, initial or subsequent, for tumor, Eales disease, etc.	BR+		3.0

[Order 74-7, § 296-22-430, filed 1/30/74; Order 68-7, § 296-22-430, filed 11/27/68, effective 1/1/69.]

WAC 296-22-435 Extraocular muscles.

	Follow- Unit up Value Days=	Basic Anes@	
Incision, Excision and Repair			
67300 Muscle surgery (resection, recession, advancement, etc.) any number of muscles, one or both eyes	14.0	30	3.0
67301 subsequent.....	BR+		3.0
67320 Muscle transplant (Hummelsheim type procedure, etc.), one or more stages.....	18.0	30	3.0

[Order 74-7, § 296-22-435, filed 1/30/74; Order 68-7, § 296-22-435, filed 11/27/68, effective 1/1/69.]

WAC 296-22-440 Orbit.

	Follow- Unit up Value Days=	Basic Anes@	
Incision			
67400 Orbitotomy with exploration.....	12.0	30	7.0
67405 with drainage of intraorbital abscess..	12.0	30	7.0
67410 with removal of intraorbital foreign body or tumor.....	BR+		7.0
67420 Excision of lesion of orbit, requiring bone flap	22.0	30	7.0
67440 Orbital decompression (Kroenlein type).....	20.0	30	7.0

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	Follow- Unit up Value Days=	Basic Anes@	
67460 Exenteration of orbit, without skin graft.....	20.0	60	7.0
(For skin graft see 15100-15261)			
67465 including orbital bone.....	BR+		7.0
Introduction			
*67500 Retrobulbar injection, therapeutic agents (priscoline, procaine, etc.) (independent procedure)	*0.6	0	
67505 alcohol injection	2.0	15	
67510 air or opaque contrast medium for radiological procedure	1.0	7	

Repair

(For plastic repair of orbit, see 13000-15750, 21210, 21230)

(For blow-out fracture, see 21380-21395, 31030)

(For bone or cartilage graft, or alloplastic implant, see 21210, 21230)

[Order 74-7, § 296-22-440, filed 1/30/74; Order 68-7, § 296-22-440, filed 11/27/68, effective 1/1/69.]

WAC 296-22-445 Eyelids.

	Follow- Unit up Value Days=	Basic Anes@	
Incision			
*67700 Blepharotomy with drainage of abscess ...	*0.4	0	3.0
*67705 with drainage of meibomian glands or hordeolum (stye) ...	*0.4	0	3.0
Excision			
(For blepharectomy, see 11400-11660, 13000-15760)			
(For excision of lesion of eyelid, malignant, see 11640-11660, 13000-15760)			
(For excision of xantholasma, see			

Surgical Fees

296-22-450

	Unit Value	Follow-up Days=	Basic Anes@
11400-11460, 13000-15760)			
67800 Excision of meibomian gland (chalazion), single	1.2	15	3.0
67801 multiple, same lid . . .	1.4	15	3.0
67805 different lids	1.6	15	3.0
*67820 Epilation, simple	*0.4	0	
*67825 by electrolysis	*1.0	0	3.0

(For tarsorrhaphy, suture of tarsal plate, see 12020, 13020-13260)

(For canthorrhaphy, suture of palpebral fissure of canthus, see 12020, 13020-13260)

[Order 74-7, § 296-22-445, filed 1/30/74; Order 68-7, § 296-22-445, filed 11/27/68, effective 1/1/69.]

Repair

(For blepharoplasty, plastic repair of eyelid, with or without graft, any type, see 12020, 12240, 13000-15760)

(For canthoplasty, plastic repair of canthus, see 12020, 12240, 13000-15760)

(For plastic restoration of eyebrow, see 15240-15740)

(For tarsoplasty, plastic repair of tarsal plate, see 13020-14160)

(For reposition of ciliary base, see 13000-15760)

67900 Blepharoptosis repair, superior rectus, levator or frontalis methods, unilateral	16.0	60	3.0
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67905 sling method (includes obtaining fascia)	12.0	60	3.0
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67920 Caustery puncture for entropion or ectropion	1.2	15	3.0
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67940 Ectropion repair (e.g., Kuhnt-Szymanowski type procedure)	10.0	30	3.0
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67960 Entropion repair (e.g., Wheeler type procedure)	10.0	30	3.0
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(For cicatricial ectropion or entropion requiring scar excision, skin graft, etc., see 15100-15260)

Suture

(For blepharorrhaphy, suture of eyelids, see 12020, 13020-13260)

WAC 296-22-450 Conjunctiva.

	Unit Value	Follow-up Days=	Basic Anes@
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Incision

*68000 Removal of surface foreign body	*0.2	0	
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*68005 embedded foreign body, including concretion(s)	*0.4	0	3.0
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68020 Evacuation of cyst(s) (e.g., serous) (independent procedure)	0.4	15	3.0
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Excision

68100 Biopsy of conjunctiva	1.0	15	3.0
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68120 Excision of lesion of conjunctiva, benign (e.g., cyst)	1.0	15	3.0
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68125 malignant	BR+		3.0
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(For nevus, see 11440-11460)

Introduction

68200 Subconjunctival injection(s) (e.g., antibiotics, steroids) (independent procedure)	0.6	7	
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Repair

68300 Suture of conjunctiva (independent procedure)	0.8	15	3.0
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68320 Conjunctivoplasty, free graft using conjunctiva	12.0	30	3.0
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68325 using buccal mucous membrane	14.0	30	5.0
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68360 Conjunctival flap for corneal ulcer	5.0	30	3.0
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68365 for perforating injuries or secondary closure of operative wound (independent procedure)	5.0	30	5.0
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Follow-
Unit up Basic
Value Days= Anes@

Follow-
Unit up Basic
Value Days= Anes@

(For repair of symblepharon without graft, see 11400-11460, 13000-14160)

[Order 74-7, § 296-22-450, filed 1/30/74; Order 68-7, § 296-22-450, filed 11/27/68, effective 1/1/69.]

WAC 296-22-455 Lacrimal tract.

Follow-
Unit up Basic
Value Days= Anes@

Incision

68400	Drainage of lacrimal gland abscess or cyst	2.4	15	3.0
68420	Drainage of lacrimal sac: dacryocystotomy or dacryocystostomy	2.0	15	3.0
*68440	Punctum snip with dilation of punctum	*0.4	0	

Excision

68500	Excision of lacrimal gland: dacryoadenectomy	12.0	45	3.0
68520	Excision of lacrimal sac: dacryocystectomy	12.0	45	3.0
68540	Excision of lacrimal gland tumor	15.0	45	3.0

Introduction

68600	Catheterization of nasolacrimal duct with implantation of tube or stent	2.4	15	3.0
68610	Injection procedure for dacryocystography	0.6	0	

Repair

68700	Plastic operation on canaliculi	BR+		3.0
68720	Dacryocystorhinostomy: fistulization of lacrimal sac into nasal cavity, with or without anterior ethmoidectomy	14.0	60	5.0
68740	Conjunctivocystorhinostomy: fistulization of conjunctival sac to nasal cavity, direct (e.g., Jones type procedure)	15.0	90	5.0
68760	Closure of punctum by cautery	1.0	15	3.0

Manipulation

*68800	Dilation of punctum, with or without irrigation, one or both eyes	*0.4	0	3.0
*68820	Probing of nasolacrimal duct, with or without irrigation	*0.6	0	3.0
*68840	Probing and/or irrigation of canaliculus (e.g., stricture)	*0.4	0	3.0

[Order 74-7, § 296-22-455, filed 1/30/74; Order 68-7, § 296-22-455, filed 11/27/68, effective 1/1/69.]

EAR

WAC 296-22-465 External ear.

Follow-
Unit up Basic
Value Days= Anes@

(For audiometric, vestibular and speech tests, see 92500-92570)

Incision

*69000	Drainage of abscess or hematoma of auricle, simple	*0.4	0	3.0
69005	complicated, including suppurative chondritis	BR+		3.0
*69020	Drainage of abscess of external auditory canal	*0.4	0	3.0
69090	Ear piercing	0.6	7	

Excision

(For local destruction or excision of lesion of ear, see 11400-11660)

(For plastic closure, see 13000-15760)

69100	Biopsy of ear	0.6	7	3.0
69110	Excision, ear, partial, simple repair	3.0	30	3.0
69120	Complete amputation, auricle	8.0	90	3.0
69140	Excision of exostosis of external auditory canal, endaural or postaural approach, complicated	12.0	90	3.0
69150	Radical excision of malignant lesion of external auditory canal	BR+		3.0
69155	with neck dissection	BR+		6.0

Surgical Fees

296-22-470

		Follow-					Follow-		
		Unit	up	Basic			Unit	up	Basic
		Value	Days=	Anes@			Value	Days=	Anes@
Endoscopy									
*69200	Otoscopy with removal of foreign body in external auditory canal	*0.4	0		69430	for serous otitis media, unilateral	1.0	7	3.0
69205	complex, in hospital, with general anesthesia	2.0	7	3.0		with insertion of collar button or ventilating tube for serous otitis media, unilateral or bilateral, requiring hospitalization	3.0	7	3.0
Repair					69440	Tympanotomy with elevation of tympanomeatal flap, for middle ear exploration	10.0	30	3.0
	(For otoplasty: plastic operation on ear, see 13000-15760)				Excision				
	(For reconstruction of ear with graft of skin plus cartilage, bone or other implant, see 13000-15760, 21230, 21235)				69500	Mastoidectomy, simple	12.0	180	5.0
69300	Otoplasty of cartilage (protruding ear), with or without reduction in size, unilateral	10.0	180	3.0	69510	modified radical or radical, without skin graft	20.0	180	6.0
69301	bilateral	16.0	180	3.0	69515	with skin graft (includes obtaining graft)	21.0	180	6.0
69320	Reconstruct external auditory canal for congenital atresia, single stage	16.0	180	3.0	69530	Petrous apicectomy including radical mastoidectomy	30.0	180	6.0
	(For combination with middle ear reconstruction see 69630)				69540	Removal of middle ear polyp, simple	1.0	15	3.0
Suture					69545	complicated	2.0	15	3.0
	(For suture of wound or injury of ear, see 12000-14300)				Repair				
	[Order 74-7, § 296-22-465, filed 1/30/74; Order 68-7, § 296-22-465, filed 11/27/68, effective 1/1/69.]				69600	Revision of radical mastoidectomy or tympanoplasty, with or without skin graft, musculoplasty, etc., same surgeon	15.0	180	6.0
						(For revision by second surgeon, see 69510, 69630)			
	WAC 296-22-470 Middle ear.				*69610	Patching tympanic membrane, with or without cauterization	*0.6	0	3.0
					69620	Myringoplasty, uncomplicated	13.0	180	3.0
					69630	Tympanoplasty, without mastoidectomy (may include change in contours of external auditory canal and be combined with middle ear, including ossicular chain reconstruction and/or attic surgery), post auricular or endaural approach	22.0	180	3.0
Introduction					69640	with mastoidectomy	24.0	180	6.0
69400	Eustachian tube catheterization and inflation, unilateral or bilateral	0.3	0		69650	Stapes mobilization, primary or secondary	12.0	90	3.0
Incision									
*69420	Myringotomy, with or without eustachian tube inflation and with or without aspiration	*0.6	0	3.0					
69425	with insertion of tube								

Chapter 296-23 WAC

RADIOLOGY, RADIATION THERAPY, NUCLEAR MEDICINE, PATHOLOGY, HOSPITAL, CHIROPRACTIC, PHYSICAL THERAPY AND DRUGLESS THERAPEUTICS

		Follow- Unit up Value Days=	Basic Anes@
69660	Stapedectomy with insertion of prosthetic stapes with fenestration of the oval window	20.0	90 5.0
69665	revision, same surgeon	10.0	90 5.0
69670	Mastoid obliteration . . .	BR+	6.0
Suture			
69700	Closure of fistula, mastoid (independent procedure)	7.0	60 3.0
69720	Decompression, facial nerve, intratemporal, with or without neurolysis	24.0	180 6.0
69740	Suture and/or graft, facial nerve, intratemporal	30.0	180 6.0

[Order 74-7, § 296-22-470, filed 1/30/74; Order 68-7, § 296-22-470, filed 11/27/68, effective 1/1/69.]

WAC 296-22-475 Internal ear.

		Follow- Unit up Value Days=	Basic Anes@
Incision			
69800	Labyrinthotomy, any type (including cryo-otic-periotic shunt) . . .	20.0	180 6.0
69820	Fenestration of semicircular canal	22.0	180 6.0
69840	Revision of fenestration operation, same surgeon	11.0	180 6.0
	(For revision by second surgeon, see 69820)		
Excision			
69900	Labyrinthectomy	BR+	6.0
69920	Removal of glomus jugulare or glomus tympanicus tumor, with or without valvectomy	BR+	9.0
	(For removal of acoustic nerve tumor, see 61520)		

[Order 74-7, § 296-22-475, filed 1/30/74; Order 68-7, § 296-22-475, filed 11/27/68, effective 1/1/69.]

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RADIOLOGY

- 296-23-010 General.
- 296-23-01001 Injection procedures.
- 296-23-01002 Custody of x-rays.
- 296-23-01004 Billing procedures.
- 296-23-01005 Duplication of x-rays.
- 296-23-01006 Radiology, radiation therapy, nuclear medicine and pathology modifiers.
- 296-23-01007 Unlisted service or procedure.
- 296-23-01008 Special report.
- 296-23-013 Footnotes.
- 296-23-015 Head and neck.
- 296-23-020 Chest.
- 296-23-025 Spine and pelvis.
- 296-23-030 Upper extremities.
- 296-23-035 Lower extremities.
- 296-23-040 Abdomen.
- 296-23-045 Gastrointestinal tract.
- 296-23-050 Urinary tract.
- 296-23-055 Female genital tract.
- 296-23-065 Vascular system.
- 296-23-079 Miscellaneous.
- 296-23-07901 Diagnostic ultrasound.
- 296-23-07902 Head and neck.
- 296-23-07903 Heart.
- 296-23-07904 Thorax.
- 296-23-07905 Abdomen and retroperitoneum.
- 296-23-07906 Obstetrics, gynecology and pelvis.
- 296-23-07907 Peripheral vascular system.
- 296-23-07908 Miscellaneous.

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- 296-23-080 General information and instructions.
- 296-23-105 Teletherapy.
- 296-23-110 Brachytherapy.
- 296-23-115 Special adjunctive services.

NUCLEAR MEDICINE

- 296-23-120 General information and instructions.
- 296-23-125 Diagnostic.
- 296-23-130 Therapeutic.

PATHOLOGY

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- 296-23-201 Unlisted service or procedure.
- 296-23-20101 Special report.
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- 296-23-208 Urinalysis.
- 296-23-212 Chemistry and toxicology.
- 296-23-216 Hematology.
- 296-23-221 Immunology.
- 296-23-224 Microbiology.
- 296-23-228 Anatomic pathology.
- 296-23-232 Miscellaneous.

HOSPITAL

- 296-23-300 General statement.

HOSPITAL RULES

- 296-23-301 Rates for daily and ancillary services.
- 296-23-305 Questionable beneficiary.
- 296-23-310 Refund of incorrect payments.
- 296-23-315 Treatment of unrelated conditions.
- 296-23-330 Closed claims.
- 296-23-335 RX's take home.
- 296-23-340 Routine laboratory procedures on admission.
- 296-23-356 Billing procedures.
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Suture			
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[Order 74-7, § 296-22-470, filed 1/30/74; Order 68-7, § 296-22-470, filed 11/27/68, effective 1/1/69.]

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	(For revision by second surgeon, see 69820)		
Excision			
69900	Labyrinthectomy	BR+	6.0
69920	Removal of glomus jugulare or glomus tympanicus tumor, with or without valvectomy	BR+	9.0
	(For removal of acoustic nerve tumor, see 61520)		

[Order 74-7, § 296-22-475, filed 1/30/74; Order 68-7, § 296-22-475, filed 11/27/68, effective 1/1/69.]

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- 296-23-221 Immunology.
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- 296-23-315 Treatment of unrelated conditions.
- 296-23-330 Closed claims.
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- 296-23-340 Routine laboratory procedures on admission.
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296-23-395 Recovery room—Use of.

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296-23-610 General instructions.
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 296-23-61002 Acceptance of rules and fees.
 296-23-61003 Penalties.
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 296-23-61005 Treatment following initial treatment.
 296-23-61006 Rejected and closed claims.
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 296-23-61008 Doctor's supplemental report.
 296-23-61009 Transfer of practitioners.
 296-23-61010 Concurrent treatment.
 296-23-61011 Billing procedures.
 296-23-615 Office visits.
 296-23-620 Consultations.

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296-23-710 Physical therapy rules.
 296-23-715 Modalities.
 296-23-720 Procedures.
 296-23-725 Tests and measurements.

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296-23-810 General instructions.
 296-23-81001 Who may treat
 296-23-81002 Acceptance of rules and fees.
 296-23-81003 Penalties.
 296-23-81004 Initial treatment and report of accident.
 296-23-81005 Treatment following initial treatment.
 296-23-81006 Rejected and closed claims.
 296-23-81007 Treatment beyond 60 days.
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 296-23-81009 Transfer of practitioners.
 296-23-81010 Concurrent treatment.
 296-23-81011 Billing procedures.
 296-23-811 Office visits.
 296-23-900 Nurse practitioner rules.
 296-23-910 Maximum values are established for services rendered by nurse practitioners.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-23-060, 296-23-070, 296-23-075, 296-23-085, 296-23-090, 296-23-095, 296-23-100, 296-23-205, 296-23-210, 296-23-215, 296-23-220, 296-23-225, 296-23-230, 296-23-235, 296-23-240 and 296-23-245. [Order 68-7, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-7, filed 1/30/74.
 296-23-01003 Identification of x-rays. [Order 76-34, § 296-23-01003, filed 11/24/76, effective 1/1/77.] Repealed by Order 77-27, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, filed 12/1/77; Emergency Order 77-16, filed 9/6/77.
 296-23-320 Private room—Critical cases. [Order 74-7, § 296-23-320, filed 1/30/74; Order 68-7, § 296-23-320, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-39, filed 11/22/74 and Order 75-39, filed 11/28/75.
 296-23-325 Isolation of infected cases. [Order 70-12, § 296-23-325, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-325, filed 11/27/68, effective 1/1/69.] Repealed by Order 74-39, filed 11/22/74 and Order 75-39, filed 11/28/75.
 296-23-345 Per diem rate. [Order 68-7, § 296-23-345, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-350 Bed accommodations. [Order 74-39, § 296-23-350, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-350, filed 1/30/74; Order 68-7, § 296-23-350, filed 11/27/68, effective 1/1/69.] Repealed by Order 75-39, filed 11/28/75, effective 1/1/76.
 296-23-355 Rate affidavit. [Order 75-39, § 296-23-355, filed 11/28/75, effective 1/1/76; Order 74-7, § 296-23-355, filed 1/30/74; Order 70-12, § 296-23-355, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-355,

filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-360 Hospital daily service charge. [Order 74-7, § 296-23-360, filed 1/30/74; Order 68-7, § 296-23-360, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-365 Drugs. [Order 74-7, § 296-23-365, filed 1/30/74; Order 68-7, § 296-23-365, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-370 Dressing room and emergency room. [Order 74-39, § 296-23-370, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-370, filed 1/30/74; Order 68-7, § 296-23-370, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-375 Anesthetic material. [Order 74-7, § 296-23-375, filed 1/30/74; Order 68-7, § 296-23-375, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-380 Anesthetic administration—General. [Order 74-39, § 296-23-380, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-380, filed 1/30/74; Order 68-7, § 296-23-380, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-385 Anesthetic administration—Other. [Order 74-7, § 296-23-385, filed 1/30/74; Order 68-7, § 296-23-385, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-390 Surgery. [Order 74-39, § 296-23-390, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-390, filed 1/30/74; Order 68-7, § 296-23-390, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-400 Oxygen. [Order 74-7, § 296-23-400, filed 1/30/74; Order 68-7, § 296-23-400, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-405 Parenteral fluid therapy. [Order 74-7, § 296-23-405, filed 1/30/74; Order 68-7, § 296-23-405, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-410 Use of cast room for application of casts. [Order 74-7, § 296-23-410, filed 1/30/74; Order 68-7, § 296-23-410, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-415 Cast—Materials only. [Order 74-7, § 296-23-415, filed 1/30/74; Order 68-7, § 296-23-415, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-420 Fracture appliances. [Order 74-7, § 296-23-420, filed 1/30/74; Order 68-7, § 296-23-420, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-425 Laboratory. [Order 74-7, § 296-23-425, filed 1/30/74; Order 68-7, § 296-23-425, filed 11/27/68, effective 1/1/69.] Repealed by Order 76-34, filed 11/24/76, effective 1/1/77.
 296-23-510 Osteopathic office visits. [Order 68-7, § 296-23-510, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71.
 296-23-515 Osteopathic hospital visits. [Order 68-7, § 296-23-515, filed 11/27/68, effective 1/1/69.] Repealed by Order 70-12, filed 12/1/70, effective 1/1/71.

RADIOLOGY

WAC 296-23-010 General. UNIT VALUE: The following values apply only when these services are performed by or under the responsible supervision of a physician.

The unit value represents x-ray service units appropriate for billing charges for professional services plus expenses of nonradiologist personnel, materials, facilities

and space used, for diagnostic or therapeutic services rendered, but excludes the cost of radio-isotopes. This value is applicable in any situation in which a single charge is made to include both professional services and the cost involved in providing that service.

PROFESSIONAL COMPONENT: The professional component (PC) represents the professional services of the physician, including examination of the patient, when indicated, performance and/or supervision of the procedure, interpretation and reporting of the examination and consultation with the attending physician. This component is applicable in any situation in which the physician submits a charge for these professional services only. It is distinct from and does not include the time devoted by technologists, nor costs of materials, equipment and space.

Values for office and hospital visits, consultation and other medical services are listed in chapter 296-21 WAC, the Medicine section of this fee schedule. [Order 76-34, § 296-23-010, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-010, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-010, filed 1/30/74; Order 71-6, § 296-23-010, filed 6/1/71; Order 70-12, § 296-23-010, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-010, filed 11/27/68, effective 1/1/69.]

WAC 296-23-01001 Injection procedures. Values for injection procedures include all usual pre- and post-injection care specifically related to the injection procedure, necessary local anesthesia, placement of needle or catheter, and injection of contrast media.

Vascular injection procedures are listed in the Cardiovascular section, WAC 296-21-066 and 296-22-125. Other injection procedures are listed in the appropriate sections. The injection procedure is included in the unit value for radiographic procedures marked with a #. [Order 76-34, § 296-23-01001, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01002 Custody of x-rays. (1) Radiographs are required for comparison and interpretation in determining a permanent disability, administrative or legal decisions and for cases in litigation, and must be retained for a period of seven years.

(2) X-rays must be made available upon request to consultants, to medical examiners, to the department, to self-insurers and/or the board of industrial insurance appeals.

(3) In cases where the injured worker transfers from one physician to another, the former attending physician will immediately forward all films in his possession to the department in Olympia or to the self-insurer for access by the next attending physician.

(4) When a physician's office is closed because of death, retirement or upon leaving the state, department approved custodial arrangements must be made to insure availability on request. If a radiological office is closed for any of the previously listed reasons or because the partnership or corporation is being dissolved, disposition of x-rays for industrial injuries will be handled in the same manner. In the event custodial arrangements are to

be made, the department must approve the arrangements prior to transfer of x-rays to the custodian so as to assure their availability to the Department or self-insurer upon request. [Order 77-27, § 296-23-01002, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-01002, filed 12/1/77; Emergency Order 77-16, § 296-23-01002, filed 9/6/77; Order 76-34, § 296-23-01002, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01004 Billing procedures. (1) Bills must be itemized on department or self-insurer forms, as the case may be, specifying the date, number, type and size of the films taken and the charges for each.

(2) The bill form must be completed in detail to include the claim number, the account number and the name of the doctor rendering the service. Bills will be accepted when signed by other than the doctor rendering the service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges, rests with the doctor rendering the service.

(3) For a bill to be considered for payment, it must be received in the department or by the self-insurer within ninety days from the end of the month in which the service was rendered.

(4) Bills for x-ray services must be in conformance with the fee schedule. A complete narrative interpretation of the x-rays must be submitted with the bill.

(5) Payment will not be made on closed or rejected claims, except those taken in conjunction with submission of an application to reopen a closed claim.

(6) The department or the self-insurer, may reject bills for services rendered in violation of the medical aid rules.

(7) The claim number must be placed on each bill and on each page of attached documents. [Order 77-27, § 296-23-01004, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-01004, filed 12/1/77; Emergency Order 77-16, § 296-23-01004, filed 9/6/77; Order 76-34, § 296-23-01004, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01005 Duplication of x-rays. When an injured worker is hospitalized, films of the industrial injury taken before hospitalization shall be taken promptly to the hospital radiological department for review in order to preclude any unnecessary duplication. The attending physician shall make available all radiographs on the injured worker to consulting physicians.

When recent radiographs of the spine have been taken and are available for review, duplicate radiographs should not be taken at the time of a myelogram. [Order 76-34, § 296-23-01005, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01006 Radiology, radiation therapy, nuclear medicine and pathology modifiers. Listed values for most procedures may be modified under certain circumstances as listed below. When applicable, the modifying circumstances should be identified by the addition of the appropriate "modifier code number" (including

the hyphen) after the usual procedure number. The value should be listed as a single modified total for the procedure. When multiple modifiers are applicable to a single procedure, see modifier -99.

-22 UNUSUAL SERVICES: When the services provided are greater than those usually required for the listed procedure, identify by adding this modifier (-22) to the usual procedure number. List modified value. May require report.

-26 PROFESSIONAL COMPONENT: The listed values of certain procedures (laboratory, x-ray, specific diagnostic services, etc.) are a combination of a physician component and a technical component. When the physician component is billed separately, identify by adding this modifier (-26) to the usual procedure number and value as appropriate.

-50 MULTIPLE OR BILATERAL VASCULAR PROCEDURES: When multiple or bilateral vascular radiographic procedures which add significant time and complexity are performed at the same operative session, identify and value the major radiographic procedures as listed. Identify the secondary or lesser radiographic procedures by adding this modifier (-50) to the procedure numbers and value at 50 percent of the listed values unless otherwise indicated.

-52 REDUCED VALUES: Under certain circumstances, the listed value is reduced or eliminated because of ground rules, common practice, or at the physician's election (e.g., a physician may elect to reduce the listed values in a patient with multiple injuries requiring extensive radiographic examination.) Under these or similar circumstances, the services provided can be identified by their usual procedure numbers and the use of a reduced value indicated by adding this modifier (-52) to the procedure number. (Use of this modifier provides a means of reporting services at reduced charge without disturbing usual relative values.)

-90 REFERENCE (OUTSIDE) LABORATORY: When laboratory procedures are performed by other than the billing physician the procedure(s) shall be identified by this modifier (-90) to the usual single or panel procedure number and shall be billed as charged to the physician. (For collection and handling charges, see 99000, Medicine section.)

-99 MULTIPLE MODIFIERS: Under certain circumstances multiple modifiers may be applicable (e.g., a physician may perform multiple or bilateral vascular procedures (modifier -50) and bill the professional component (modifier -26)). Under these circumstances, identify by adding this modifier (-99) to the usual procedure number and briefly indicate the circumstance. Value in accordance with appropriate modifiers.

[Order 76-34, § 296-23-01006, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01007 Unlisted service or procedure.
A service or procedure may be provided that is not listed in this fee schedule. When reporting such a service, the appropriate "Unlisted Procedure" code may be used to indicate the service, identifying it by "Special Report" as discussed in WAC 296-23-01008 below. The "Unlisted Procedures" and accompanying codes for RADIOLOGY (Including Nuclear Medicine and Diagnostic Ultrasound) are as follows:

- 76499 Unlisted diagnostic radiologic procedure
- 76999 Unlisted diagnostic ultrasound examination
- 77999 Unlisted radiotherapy procedure
- 79999 Unlisted nuclear medicine procedure

[Order 76-34, § 296-23-01007, filed 11/24/76, effective 1/1/77.]

WAC 296-23-01008 Special report. A service that is rarely provided, unusual, variable, or new, may require a special report in determining medical appropriateness of the service. Pertinent information should include an adequate definition or description of the nature, extent, and the need for the procedure; and the time, effort and equipment necessary to provide the service. Additional items which may be helpful might include: Complexity of symptoms, final diagnosis, pertinent physical findings, diagnostic and therapeutic procedures, concurrent problems, and follow-up care. [Order 76-34, § 296-23-01008, filed 11/24/76, effective 1/1/77.]

WAC 296-23-013 Footnotes.

- + BR: By Report; see WAC 296-20-010, item 11 for detailed information.
- # See WAC 296-23-010, Rule 2 for meaning.
- o As part of a Panel see 80003-80013.

[Order 74-7, § 296-23-013, filed 1/30/74.]

WAC 296-23-015 Head and neck.

		Unit Value	Professional Component
70000	Pneumoencephalography, limited	30.0	12.0
70002	complete, including posterior fossa studies, laminography, etc.	40.0	16.0
	(For injection procedure for pneumoencephalography, see 61900)		
70010	Myelography, posterior fossa	BR+	
	(For injection procedure, see 63520)		
70020	Ventriculography, air or positive contrast	24.0	8.0
	(For injection procedures for ventriculography, see 61025, 61030, 61120)		

	Unit Value	Professional Component		Unit Value	Professional Component
70022 Stereotaxic localization ..	BR+		#70374 Larynogography, contrast	#24.0	9.6
70030 Eye, for foreign body	8.8	3.5	70380 Salivary gland for calculus	6.4	2.6
70040 for localization of foreign body (70030 not included)	14.0	6.4	70390 Sialography	8.0	3.2
70050 combined 70030 and 70040	18.0	8.0	[Order 76-34, § 296-23-015, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-061 (codified as WAC 296-23-015), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-015, filed 1/30/74; Order 68-7, § 296-23-015, filed 11/27/68, effective 1/1/69.]		
70100 Mandible, limited or unilateral, less than four views	6.0	2.4	WAC 296-23-020 Chest.		
70110 complete, minimum of four views	10.0	4.0			
70120 Mastoid(s) limited or unilateral, less than three views per side	6.0	2.4			
70130 complete and bilateral, minimum of three views per side	12.0	4.8			
70134 Internal auditory meatus	12.0	4.8	71000 Chest, "Minifilm"	1.7	0.7
70140 Facial bones, limited, less than three views	6.0	2.4	71010 single view, posteroanterior	4.0	1.6
70150 complete, and/or orbits, minimum of three views	10.0	4.0	71020 two views, posteroanterior and lateral	6.0	2.4
70154 with nasal bones	12.0	4.8	71030 complete, minimum of four views	8.0	3.2
70160 Nasal bones	6.4	2.6	71034 including fluoroscopy ..	10.0	4.0
70170 Nasolacrimal duct (dacryocystography)	10.0	4.0	(For independent chest fluoroscopy, see 76000)		
(For injection procedure for dacryocystography, see 68850)			71036 Fluoroscopic localization for needle biopsy of intrathoracic lesion, including follow-up films ...	BR+	
70190 Optic foramina, minimum of four views	6.0	2.4	(For biopsy procedure, see 32420)		
70210 Paranasal sinuses, limited, less than three views	5.0	2.0	71040 Bronchography, unilateral ..	14.0	5.6
70220 complete, minimum of three views	8.8	3.5	71060 bilateral	22.0	8.8
70240 Sella turcica	5.0	2.0	(For injection procedure for bronchography, see 31655, 31710)		
70250 Skull, limited, less than four views, with or without stereo	6.0	2.4	71100 Ribs, unilateral, minimum of two views	7.2	2.9
70260 complete, minimum of four views, with or without stereo	12.0	4.8	71110 bilateral, minimum of three views	10.0	4.0
70300 Teeth, single view	2.0	0.8	71120 Sternum, minimum of two views	6.0	2.4
70310 partial examination, less than full mouth ...	4.0	1.6	71130 Sternoclavicular joint(s), minimum of three views ..	6.0	2.4
70320 complete examination, full mouth	8.0	3.2	[Order 76-34, § 296-23-020, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-064 (codified as WAC 296-23-020), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-020, filed 1/30/74; Order 68-7, § 296-23-020, filed 11/27/68, effective 1/1/69.]		
70330 Temporomandibular joints, bilateral, open and closed mouth	8.8	3.5	WAC 296-23-025 Spine and pelvis.		
70350 Cephalogram (orthodontic)	4.0	1.6			
70360 Neck for soft tissues	4.0	1.6			

Drugless Therapeutics

296-23-035

	Unit Value	Professional Component		Unit Value	Professional Component
72010 Spine, entire, survey study (A-P & lateral)	16.0	6.4	73000 Clavicle	4.8	1.9
72040 cervical, A-P and lateral	6.0	2.4	73010 Scapula	6.0	2.4
72050 complete, minimum of four views	10.0	4.0	73020 Shoulder, limited, one view	4.0	1.6
72052 including flexion and extension views	13.2	5.3	73030 complete, minimum of two views	6.0	2.4
72070 thoracic, A-P and lateral	7.0	2.8	73040 arthrography	10.0	4.0
72080 thoraco-lumbar junction, A-P and lateral	7.0	2.8	(For injection procedure for arthrography, see 23350)		
72090 scoliosis study, including supine and erect studies	6.0	2.4	73050 Acromio-clavicular joints, bilateral, with or without weighted distraction	7.0	2.8
72100 lumbar, limited, A-P and lateral	7.0	2.8	73060 Humerus, including one joint, minimum of two views	4.8	1.9
72110 lumbosacral, complete, with oblique views	13.0	5.2	73070 Elbow, limited, A-P and lateral	4.8	1.9
72114 including bending views	16.0	6.4	73080 complete, minimum of three views	6.0	2.4
72120 bending views only, minimum of four views	8.0	3.2	73090 Forearm, including one joint, A-P and lateral	4.8	1.9
72170 Pelvis, limited, A-P only	5.0	2.0	73100 Wrist, limited, A-P and lateral	4.0	1.6
72180 stereo	6.4	2.6	73110 complete, minimum of three views	6.0	2.4
72190 complete, minimum of three views	8.0	3.2	73120 Hand, limited, minimum of two views	4.0	1.6
(For pelvimetry, see 74710)			73130 complete, minimum of three views	6.0	2.4
72200 Sacro-iliac joints, limited, less than three views	5.0	2.0	73140 Finger(s), minimum of two views	3.6	1.4
72202 complete, minimum of three views	8.0	3.2	[Order 76-34, § 296-23-030, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-071 (codified as WAC 296-23-030), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-030, filed 1/30/74; Order 68-7, § 296-23-030, filed 11/27/68, effective 1/1/69.]		
72220 Sacrum and coccyx, minimum of two views	6.4	2.6	WAC 296-23-035 Lower extremities.		
72240 Myelography, cervical	18.0	7.2			
72255 thoracic	18.0	7.2			
72265 lumbosacral	18.0	7.2			
72270 entire spinal canal	30.0	12.0			
(For injection procedures for myelography, see 63510-63520)					
72285 Diskography, cervical	20.0	8.0			
72295 lumbar	20.0	8.0			
(For injection procedures for diskography, see 63530, 63535)					
[Order 76-34, § 296-23-025, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-067 (codified as WAC 296-23-025), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-025, filed 1/30/74; Order 68-7, § 296-23-025, filed 11/27/68, effective 1/1/69.]			73500 Hip, unilateral, limited, one view	5.0	2.0
WAC 296-23-030 Upper extremities.			73510 complete, minimum of two views	7.0	2.8
			73520 bilateral, complete minimum of two views of each hip (including A-P of pelvis)	9.6	3.8
			73530 during operative procedure, up to four studies	16.0	5.3
			73531 each additional study,		

	Unit Value	Professional Component
over four.....	3.0	1.2
73540 Hip and pelvis, infant or child, complete, minimum of two views	6.4	2.6
73550 Femur (thigh), including one joint, A-P and lateral.	6.0	2.4
73560 Knee, limited, A-P and lateral.....	4.4	1.8
73570 complete, minimum of three views	6.4	2.6
73580 arthrography.....	16.0	6.4

(For injection procedure for arthrography, see 27370)

73590 Tibia and fibula (leg), including one joint, A-P and lateral	4.8	1.9
73600 Ankle, limited, A-P and lateral	4.4	1.8
73610 complete, minimum of three views	6.0	2.4
73620 Foot, limited, A-P and lateral	4.0	1.6
73630 complete, minimum of three views	5.6	2.2
73640 Foot and ankle, minimum of three views	9.6	3.8
73650 Os calcis (heel), minimum of two views	4.4	1.8
73660 Toe(s), minimum of two views.....	3.6	1.4

[Order 76-34, § 296-23-035, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-074 (codified as WAC 296-23-035), filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-035, filed 1/30/74; Order 68-7, § 296-23-035, filed 11/27/68, effective 1/1/69.]

WAC 296-23-040 Abdomen.

	Unit Value	Professional Component
74000 Abdomen, single view (KUB) A-P	4.0	1.6
74010 with additional oblique or cone view	6.0	2.4
74020 complete, includes ducubitus and/or erect views	8.0	3.2

[Order 76-34, § 296-23-040, filed 11/24/76, effective 1/1/77; Order 74-39, § 296-23-077 (codified as WAC 296-23-040), filed 11/22/74, effective 1/1/75; Order

74-7, § 296-23-040, filed 1/30/74; Order 68-7, § 296-23-040, filed 11/27/68, effective 1/1/69.]

WAC 296-23-045 Gastrointestinal tract.

	Unit Value	Professional Component
74210 Pharynx and/or cervical esophagus	8.8	4.8
74220 Esophagus.....	8.8	4.8
74230 Pharynx and/or esophagus, by cineradiography..	12.0	6.6
74240 Uppergastrointestinal tract, with or without delayed films, without KUB	14.0	7.7
74241 with KUB	15.2	8.0
74245 with small bowel, includes multiple serial films, with or without fluoroscopy	17.6	8.8
74250 Small bowel, includes multiple serial films with or without fluoroscopy or KUB, independent study.	14.0	7.0
74270 Colon, barium enema....	12.0	6.6
74275 with air contrast	17.6	8.8
74280 Air contrast enema, only.	14.0	7.0
74290 Cholecystography, oral ..	9.6	3.8
74291 repeat examination, same study	4.8	1.9
74300 Cholangiography, operative	10.0	4.0
#74305 postoperative.....	#12.0	6.0
#74310 intravenous	#16.0	6.4
74315 oral	12.0	4.8
74320 percutaneous, transhepatic	16.0	6.4

(For injection procedure for percutaneous transhepatic cholangiography, see 47500)

[Order 76-34, § 296-23-045, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-045, filed 1/30/74; Order 68-7, § 296-23-045, filed 11/27/68, effective 1/1/69.]

WAC 296-23-050 Urinary tract.

	Unit Value	Professional Component
#74400 Urography, excretory (IVP)	15.2	6.1
#74405 hypertensive	#16.0	5.8
#74410 infusion (DIP)	#20.0	8.0
#74415 with		

(For kidney, ureter and bladder, see 74000-74020)

[Order 76-34, § 296-23-055, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-055, filed 1/30/74; Order 68-7, § 296-23-055, filed 11/27/68, effective 1/1/69.]

	Unit Value	Professional Component
74420 nephrotomography	#26.0	10.4
retrograde, with or without KUB	12.0	4.8
74430 Cystography, contrast or chain	8.8	3.5
(For injection procedure for cystography, see 51600)		
74440 Vasography, vesiculography, or epididymography	8.8	3.5
(For injection procedure, see 52010, 52110, 55300)		
74450 Urethrocystography, retrograde	9.6	3.8
74455 voiding	14.0	5.6
(For injection procedure for urethrocystography, see 51610)		
74460 Retroperitoneal pneumography	12.0	4.8
(For injection procedure for retroperitoneal pneumography, see 49430)		
74470 Translumbar renal cyst study (contract visualization) or antegrade urography	10.0	4.0
[Order 76-34, § 296-23-050, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-050, filed 1/30/74; Order 68-7, § 296-23-050, filed 11/27/68, effective 1/1/69.]		

WAC 296-23-055 Female genital tract.

	Unit Value	Professional Component
(For abdomen and pelvis, see 74000-74020, 72170-72190)		
74710 Pelvimetry	10.0	4.0
74720 Abdomen for fetal age, fetal position and/or placental localization, single view	4.0	1.6
74725 multiple views	6.0	2.4
74740 Hysterosalpingography	10.8	4.3
(For injection procedure for hysterosalpingography, see 58340)		
74760 Pelvic pneumography	10.0	4.0
(For injection procedure for pelvic pneumography, see 49440)		

WAC 296-23-065 Vascular system.

(For vascular injection procedures, see 36000-36250.)
 (For injection procedures for lymphangiography, see 38790, 38791.)
 (For injection procedure for splenoportography, see 38200.)
 (For cardiac catheterization, see 93500-93566.)
 When multiple vascular radiographic procedures are performed at the same time (e.g., aortic arch study plus renal arteriogram), the total value shall be the value for the major procedure plus 50% of the value for the lesser procedure(s) unless otherwise indicated. See modifier -5. The cost of catheters, drugs and contrast media is included in the listed value for the radiographic procedure.

	Unit Value	Professional Component
HEART		
75500 Angiocardiology, by cineradiography	BR+	—
75505 by serialography (single projection)	BR+	—
#75510 CO ₂ angiocardiology for pericardial effusion	#20.0	8.0

AORTA AND ARTERIES

Aortography		
75600 Arch, thoracic or abdominal, without serialography	20.0	8.0
75605 by serialography	40.0	16.0
75620 Abdominal, including lower extremities, without serialography	32.0	11.2
75625 by serialography	40.0	15.2
Arteriography		
75700 Cerebral (carotid, vertebral or retrograde brachial), two projections, unilateral	40.0	17.2
75701 bilateral	50.0	17.5
75710 Extremity, unilateral, without serialography	10.0	3.8
75715 by serialography	32.0	12.2
(For lower extremities, see 75620-75625)		
75720 Renal, celiac, mesenteric, thoracic or abdominal artery, single artery, with or		

	Unit Value	Professional Component		Unit Value	Professional Component
without midstream injection	40.0	15.2	76001	extended room time with periodic fluoroscopy, per 30 minutes	BR+ —
75721 bilateral renal or multiple arterial with or without midstream injection	60.0	19.8	76020	Bone age studies	6.0 2.4
75730 Coronary, by cineradiography	BR+	—	76040	Bone length studies (orthoroentgenogram)	10.0 4.0
75735 by serialography	BR+	—	76060	Bone survey (long bone or for metastases)	15.2 6.1
75740 Pulmonary, without serialography	20.0	7.6	#76080	Fistula or sinus tract study	#12.0 4.8
75745 by serialography	40.0	15.2	76090	Mammography, unilateral	8.8 3.5
VEINS AND LYMPHATICS			76091	bilateral	13.2 5.3
75800 Lymphangiography, unilateral or bilateral	30.0	10.8	76100	Laminography (tomography, planigraphy, body section radiography) (independent procedure)	13.2 9.2
(For injection procedure for lymphangiography, see 38790, 38791)			76105	to complement routine examination	7.0 2.8
75810 Splenoportography	BR+	—	76120	Cineradiography (independent procedure)	13.2 5.3
(For injection procedure for splenoportography, see 38200)			76125	to complement routine examination	7.0 2.8
75820 Venography, extremity, unilateral	16.0	8.0	76140	Written consultation on x-ray examination made elsewhere	BR+ —
bilateral	24.0	10.1	76160	Polaroid film (in addition to value of procedure), per film	0.8 0.3
75825 caval, inferior or superior, with serialography	32.0	16.0	76180	Transportation of portable x-ray equipment and personnel to home or nursing home, at cost to physician	— —
75830 renal or adrenal, etc., with serialography	32.0	16.0			
75835 intraosseous	BR+	—			
75890 Additional serialographic run(s) [additional projection(s) for items 75500-75835], over and above the usual projections obtained may warrant an additional charge in accordance with the same supplies required	BR+	—			

[Order 76-34, § 296-23-065, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-065, filed 1/30/74; Order 68-7, § 296-23-065, filed 11/27/68, effective 1/1/69.]

WAC 296-23-079 Miscellaneous.

	Unit Value	Professional Component
76000 Fluoroscopy (independent procedures)	3.0	3.0

[Order 76-34, § 296-23-079, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-079, filed 1/30/74.]

WAC 296-23-07901 Diagnostic ultrasound.

Notes:

A-mode: Implies a one-dimensional ultrasonic measurement procedure.

M-mode: Implies a one-dimensional ultrasonic measurement procedure with movement of the amplitude and velocity of moving echo-producing structures.

scan
B-mode: Implies a two-dimensional ultrasonic scanning procedure with a two-dimensional.

[Order 75-39, § 296-23-07901, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07902 Head and neck.

	Unit Value
76500	7.7
76505	11.4
76510	15.4
76511	22.9
76512	22.9
76513	28.6
76514	28.6
76515	57.2
76516	15.4
76517	28.6
76529	BR
76530	8.0
76535	11.4

[Order 75-39, § 296-23-07902, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07903 Heart.

	Unit Value
76600	9.7
76605	BR
76610	11.4
76620	15.4
76625	7.7

[Order 75-39, § 296-23-07903, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07904 Thorax.

	Unit Value
76630	9.7
76635	BR
76640	9.7
76645	19.2

[Order 75-39, § 296-23-07904, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07905 Abdomen and retroperitoneum.

	Unit Value
76700	22.9
76705	15.4
76710	22.9
76720	22.9
76730	22.9
76735	BR
76738	BR
76740	22.9
76750	22.9
76760	9.7
76765	21.2
76770	22.9
76780	15.4

[Order 75-39, § 296-23-07905, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07906 Obstetrics, gynecology and pelvis.

	Unit Value
76800	11.4
76810	15.4
76815	9.7
76820	15.4
76825	21.2
76830	15.4
76835	22.9
76840	15.4
76850	21.2
76860	BR

[Order 75-39, § 296-23-07906, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07907 Peripheral vascular system.

	Unit Value
76900	17.1
76910	17.1
76920	21.2

[Order 75-39, § 296-23-07907, filed 11/28/75, effective 1/1/76.]

WAC 296-23-07908 Miscellaneous.

	Unit Value
76950 Echography for placement of radiation therapy fields, scan B-mode . . .	17.1
76960 Ultrasonic guidance for placement of radiation therapy fields (not listed above)	14.3
76970 Ultrasound study follow-up (not listed above)	10.0
76980 Ultrasound examination outside regular hours	8.6
76985 Ultrasound examination at bedside or in operating room	5.7
76999 Unlisted ultrasound examination (see guidelines)	BR

[Order 75-39, § 296-23-07908, filed 11/28/75, effective 1/1/76.]

RADIATION THERAPY

WAC 296-23-080 General information and instructions. (1) Radiation therapy as listed in this section includes teletherapy (i.e., the use of X-ray and other high-energy modalities, radium, cobalt, etc.) and brachytherapy (i.e., the surface, intracavitary or interstitial application of contained radioactive sources). For treatment by injectable or ingestible radioactive isotopes, see section on Nuclear Medicine.

(2) The listed values include normal follow-up care during the course of treatment and for a period of one year for malignant disease and 60 days for benign disease. Preliminary consultation and/or initial evaluation of the patient prior to radiation therapy are not included in the listed values. Complications or other circumstances requiring additional or unusual services concurrent with the therapy or during the follow-up period may warrant additional charges. For these diagnostic or therapeutic services, see appropriate sections.

(3) Values for treatment for benign conditions, or those malignant conditions which are treated on a short-term basis, are listed on a "per treatment" basis. Values for the treatment of malignant disease treated on a long-term basis are listed on a "per treatment week" basis.

DEFINITIONS

For the purposes of this section, the following definitions apply:

Simple Treatment: Treatment of benign or malignant disease requiring simple field localization or beam shaping devices, single field treatment or the use of prefabricated surface or intracavitary applicators applied for less than 8 hours.

Complex Treatment: Treatment for malignant disease requiring complex field localization and/or beam shaping devices (i.e., treatment of eyelids or mantle fields in Hodgkins disease), two or more fields per treatment,

massive single dose treatment, intracavitary cone therapy or interstitial or intracavitary applicator therapy applied for more than 8 hours. [Order 74-7, § 296-23-080, filed 1/30/74; Order 68-7, § 296-23-080, filed 11/27/68, effective 1/1/69.]

WAC 296-23-105 Teletherapy.

Unit Value

(External therapy or intracavitary cone therapy)

Per treatment schedule:

(List number of treatments)

77000 Superficial or orthovoltage (under 500 KVP), dermatoses, 3 fields or less, per treatment	3.0
77010 more than 3 fields, per treatment	4.0
77020 other benign lesions, per treatment	4.0
77030 malignant lesions, per treatment	6.0
77040 Supervoltage (600KVP-2MeV, including Cobalt-60 and Cesium), per treatment	8.0
77050 Megavoltage (3MeV or over), per treatment	BR+

Per treatment week (or major portion thereof) schedule (malignant disease):

Simple Treatment (List number of treatment weeks)

77100 Superficial voltage (0-140 KVP), per treatment week	30.0
77110 Orthovoltage (150-500 KVP), per treatment week	30.0
77120 Supervoltage (600 KVP-2 MeV, including Cobalt-60 and Cesium), per treatment week	40.0
77130 Megavoltage (3 MeV or over), per treatment week	BR+

Complex Treatment (List number of treatment weeks)

77200 Superficial voltage (0-140 KVP), per treatment week	40.0
77210 Orthovoltage (150-500 KVP), per treatment week	40.0
77220 Supervoltage (600 KVP-2 MeV, including Cobalt-60 and Cesium), per treatment week	50.0
77230 Megavoltage (3 MeV or over), per treatment week	BR+

[Order 74-7, § 296-23-105, filed 1/30/74. Formerly WAC 296-23-085.]

WAC 296-23-110 Brachytherapy.

(Radium and other isotope applications)

(For systemic, intracavitary and interstitial injection of radioactive material, see section on Nuclear Medicine)

The cost of providing the radioactive material is not included in the listed values. For use or purchase of radioactive source, use 99070.

Surface application of radioactive plaque or mold:

	Unit Value
77500 Per application	BR+
Intracavitary application of sealed radioactive source:	
77520 Simple treatment, per application . .	50.0
77530 Complex treatment, per application, total care by single physician	60.0
77531 application only (field preparation by second physician)	40.0
77532 radioactive material preparation and dosage calculation only	30.0

Interstitial insertion of sealed radioactive source:

77540 Simple treatment, per insertion . . .	BR+
77550 Complex treatment, per insertion . .	BR+
77560 Extracorporeal irradiation of circulating blood	BR+

[Order 74-7, § 296-23-110, filed 1/30/74. Formerly WAC 296-23-090.]

WAC 296-23-115 Special adjunctive services.

	Unit Value
77900 Special treatment planning, including complex dosage calculation, dosimetry measurements, and/or design of special beam shaping devices, per hour	BR+
77910 Simulation and tumor localization, per hour	BR+

(For hyperbaric pressurization, see 96200, 96201)

(For chemotherapy of malignant disease, see 96030-96050)

[Order 74-7, § 296-23-115, filed 1/30/74.]

NUCLEAR MEDICINE

WAC 296-23-120 General information and instructions. (1) The listed procedures may be performed independently or in the course of the overall medical care of the patient. When the physician providing these Nuclear Medicine services is also responsible for the preliminary diagnostic work-up and/or follow-up care of the patient, see appropriate sections for office or hospital visits, consultations and other medical, surgical, radiological and pathology services.

(2) The listed values do not include the cost of radioisotopes. To identify cost of isotopes or other drugs and materials, use 99070. [Order 74-7, § 296-23-120, filed 1/30/74.]

WAC 296-23-125 Diagnostic.

Thyroid Studies

78000 Thyroid uptake, single determination	6.0
78001 multiple determinations (as 6 and 24 hours, etc.)	8.0
78005 with scan or imaging	16.0
78010 Thyroid scanning or imaging only .	10.0
78025 Radioiodine uptake study, with thyroid suppression	12.0
78030 with thyroid stimulation	12.0
78040 Protein bound radio-iodine plasma, or conversion ratio	6.0

(For T-3 or T-4, (in vitro) uptake, see 83440-83465)

Circulation and Blood Studies

78100 Radiocobalt B-12 Schilling test, part 1	10.0
78101 Part 2	20.0
78105 Pernicious anemia radionuclide studies, other than 78100, 78101 . .	BR+
78110 Blood or plasma volume, single sampling	8.0
78111 multiple sampling	BR+

(For dye method, see 84605, 84610)

78120 Red cell mass determination, single sampling	12.0
78121 multiple sampling	BR+
78130 Red cell survival study (e.g., radiochromate)	20.0
78131 other methods	BR+
78135 plus splenic and/or hepatic sequestration	30.0
78140 Red cell splenic and/or hepatic sequestration	20.0
78150 Gastrointestinal blood loss study . .	16.0
78160 Plasma radio-iron turnover rate . .	16.0
78170 Radio-iron red cell utilization and body distribution	24.0
78180 Radio-iron red cell utilization, body distribution and storage pools	BR+
78190 Cardiac output (see also 93565) . .	12.0
78200 Circulation time (see also 93780) . .	12.0
78210 Tissue clearance studies	10.0

Scanning or Imaging

(For positron method or other complex instrumentation, see WAC 296-20-010, Item 10.)

78300 Bone, limited area (e.g., spine, pelvis, or skull, etc.)	30.0
78305 multiple areas	BR+
78306 whole body profile	BR+
78310 Brain, two views	24.0
78311 more than two views	30.0
78315 including vascular flow	BR+
78320 Heart, pericardial effusion	20.0
78325 myocardial infarction	BR+
78330 other	BR+

	Unit Value
78340 Kidney	18.0
78345 including dynamic studies	BR+
78350 Liver, one view	18.0
78351 more than one view	20.0
78360 Lung, perfusion studies	26.0
78365 ventilatory studies	BR+
78370 Pancreas (not including preliminary liver scan)	20.0
78390 Parathyroid	24.0
78400 Placenta (see also 78550)	14.0
78410 Salivary glands	14.0
78420 Spleen	20.0
78430 Whole body, other than bone	BR+
Miscellaneous	
78500 Liver function (e.g., radioiodinated rose bengal)	14.0
78510 Renal function (e.g., radio-iodo- hippurate sodium renogram)	16.0
78520 Gastrointestinal absorption (or ex- cretion) study with radioactive fat, first phase	12.0
78521 second phase	10.0
78530 Gastrointestinal protein loss, I ₁₃₁ P.V.P.	12.0
78540 Tumor localization, ocular	14.0
78545 other	BR+
78550 Placenta localization (e.g., radioio- dinated HSA) (see also 74720, 74725)	12.0

[Order 74-7, § 296-23-125, filed 1/30/74. Formerly WAC 296-23-100.]

WAC 296-23-130 Therapeutic.

Preliminary and follow-up diagnostic tests not included. For these services, see appropriate sections.

The listed values do not include the cost of radioisotopes. Use 99070 to identify cost of isotopes.

(For procedures involving radioactive sealed sources and surface application of radioactive material, see Radiation Therapy)

	Unit Value
79000 Hyperthyroidism, initial	48.0
79001 subsequent, each	20.0
79020 Thyroid suppression, initial	48.0
79021 subsequent, each	20.0
79040 Thyroid carcinoma	BR+
79110 Polycythemia vera, chronic leuke- mia, etc., per treatment	16.0
79200 Intracavitary radioactive colloid therapy	24.0
79300 Interstitial radioactive colloid therapy	60.0
79400 Intravenous therapy, e.g., for me- tastases to bone	BR+

[Title 296 WAC—p 250]

Unit
Value

(For other chemotherapy procedures, see 96030-96050.)
[Order 74-7, § 296-23-130, filed 1/30/74. Formerly WAC 296-23-095.]

PATHOLOGY

WAC 296-23-200 General information and instruction. (1) The following values apply only when these services are performed by or under the responsible supervision of a physician. Unless otherwise specified, the listed values include the collection and handling of the specimens by the laboratory performing the procedure.

(2) Necessary laboratory procedures and tissue examinations of a routine nature will be allowed provided justification is substantiated in the monthly progress report.

(3) Bills for laboratory work must be accompanied by the laboratory reports and must be submitted within sixty days of the date service is rendered. No payment will be made unless the bill has been received by the department within the sixty day period.

(4) Laboratory procedures performed by other than the billing physician shall be billed at the value charged that physician by the reference (outside) laboratory under the individual procedure number or the panel procedure number listed under "PANEL OR PROFILE TESTS" (see modifier -90).

(5) Laboratory procedures billed to the department may be denied if they are not determined to be reasonably necessary in the management of the industrial illness or injury.

(6) Panel (Profile) Tests: Panel (Profile) tests are defined as certain multiple tests performed on a single specimen of blood or urine. They are distinguished from the single or multiple test(s) performed on an "individual," "immediate" or "stat" reporting basis. [Order 74-7, § 296-23-200, filed 1/30/74; Order 70-12, § 296-23-200, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-200, filed 11/27/68, effective 1/1/69.]

WAC 296-23-201 Unlisted service or procedure. A service or procedure may be provided that is not listed in this fee schedule. When reporting such a service, the appropriate "Unlisted Procedure" code may be used to indicate the service, identifying it by "Special Report" as discussed in WAC 296-23-20101 below. The "Unlisted Procedure" and accompanying code for PATHOLOGY AND LABORATORY is as follows:

89399 Unlisted pathological or laboratory service or procedure.

[Order 76-34, § 296-23-201, filed 11/24/76, effective 1/1/77.]

WAC 296-23-20101 Special report. A service that is rarely provided, unusual, variable or new may require a special report in determining medical appropriateness of the service. Pertinent information should include an

adequate definition or description of the nature, extent, and need for the procedure; and the time, effort, and equipment necessary to provide the service. Additional items which may be helpful might include: Complexity of symptoms, final diagnosis, pertinent physical findings, diagnostic and therapeutic procedures, concurrent problems, and followup care. [Order 76-34, § 296-23-20101, filed 11/24/76, effective 1/1/77.]

WAC 296-23-204 Panel or profile tests.

The following unit values apply when three or more of the tests listed below are performed on the same blood or urine specimen under the conditions described under item 6, page 188.

Collection and handling of specimen is not included. (See 99000, Medicine section.)

Albumin		
Bilirubin, direct		
Bilirubin, total		
Calcium		
Carbon dioxide content		
Cephalin flocculation		
Chlorides		
Cholesterol		
Creatinine		
Lactic dehydrogenase		
Phosphatase, acid		
Phosphatase, alkaline		
Phosphorus		
Potassium		
Protein, total		
Sodium		
Sugar (Glucose)		
Thymol turbidity		
Transaminase, glut, oxalic (SGOT)		
Transaminase, glut, pyruvic (SGPT)		
Urea Nitrogen		
Uric Acid		
		Unit Value
80003	3 tests	28.0
80004	4 tests	32.0
80005	5 tests	36.0
80006	6 tests	40.0
80007	7 tests	44.0
80008	8 tests	48.0
80009	9 tests	52.0
80010	10 tests	56.0
80011	11 tests	60.0
80012	12 tests	64.0
80013	Over 12 tests	68.0

[Order 74-39, § 296-23-204, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-204, filed 1/30/74.]

WAC 296-23-208 Urinalysis.

(For specific analyses, see appropriate section)

81000	Urinalysis, routine, complete	12.0
81005	chemical, qualitative	8.0
81010	concentration and dilution test	14.0
81015	microscopic	10.0
81020	two or three glass test	10.0
81030	Quantitative sediment analysis and quantitative protein (Addis count)	40.0

[Order 74-7, § 296-23-208, filed 1/30/74. Formerly WAC 296-23-245 (part).]

WAC 296-23-212 Chemistry and toxicology.

(Material for examination from any source)

		Unit Value
82000	Acetaldehyde, blood	40.0
82005	Acetoacetic acid, serum	40.0
82010	Acetone, serum	40.0
82020	Acetyl choline esterase, red blood cell	40.0
82025	serum	40.0
82030	Adenosine-5' diphosphate and 5' monophosphate, blood	40.0
82035	5' triphosphate, blood	40.0
82040	Albumin, serum	20.0
	(For albumin/globulin ratio, albumin/globulin ratio by electrophoretic method, see 84155-84200.)	
82055	Alcohol (ethanol), blood, chemical	30.0
82060	by gas-liquid chromatography	40.0
82065	urine, chemical	30.0
82070	by gas-liquid chromatography	40.0

(see also 83580, 83585, 83850, 83855)

82075	breath	60.0
82085	Aldolase, blood, kinetic ultraviolet method	26.0
82090	colorimetric	20.0
82095	Alkaloids, tissue, screening	80.0
82096	quantitative	120.0
82100	urine, screening	80.0
82101	quantitative	120.0
82105	Alpha amino acid nitrogen, urine	50.0
82110	Alpha hydroxy butyric (AHB) dehydrogenase, blood, kinetic ultraviolet method	22.0
82115	colorimetric	20.0
82120	Alpha oxoglutarate (ketoglutarate), blood	40.0
82130	Amino acids, urine, chromatographic fractionation and quantitation	BR+
82140	Ammonia, blood	40.0
82145	Amphetamine, urine	80.0
82150	Amylase, blood	30.0
82155	isozymes, electrophoretic	BR+
82160	urine (diastase)	30.0
82170	Antimony, urine	80.0

	Unit Value		Unit Value
82175 Arsenic, blood, urine, gastric con- tents, hair or nails, quantitative	80.0	82450 electrometric	20.0
82177 Reinsch test (screening)	30.0	82455 spinal fluid	20.0
82180 Ascorbic acid, blood	40.0	°82465 Cholesterol, blood	°22.0
82190 Atherogenic index, blood, ultra-centrifugation, quantitative	100.0	82470 esters	30.0
82200 Barbiturates, blood, qualitative	40.0	82480 Cholinesterase, serum	40.0
82205 quantitative	60.0	82482 RBC	60.0
82210 quantitative and identification	80.0	82484 combined	80.0
82215 tissue, qualitative	100.0	82490 Chromium, blood	100.0
82220 quantitative	100.0	82495 urine	100.0
82230 Beryllium, urine	80.0	82505 Chymotrypsin, duodenal contents	30.0
82240 Bile acids, blood, fractionated	120.0	82515 Congo red, blood (includes dye and injection)	16.0
82245 Bile pigments, urine	8.0	82525 Copper, blood	60.0
°82250 Bilirubin, blood, total or direct	°24.0	82530 urine	60.0
82260 urine, quantitative	12.0	82540 Creatine, blood	24.0
82265 amniotic fluid, quantitative	30.0	82545 urine	40.0
82270 Blood, feces, occult, screening (see also 89120)	8.0	82550 Creatine phosphokinase (CPK), blood, timed kinetic ultraviolet method	26.0
82280 Boric acid, blood	100.0	82555 colorimetric	20.0
82285 urine	100.0	°82565 Creatinine, blood	°20.0
82290 Bromides, blood	24.0	°82570 urine	°20.0
82295 urine	40.0	°82575 clearance	°40.0
(For bromsulphthalein (BSP), see 84390)		82585 Cryofibrinogen, blood	40.0
82300 Cadmium, urine	100.0	82595 Cryoglobulin, blood	40.0
°82310 Calcium, blood, chemical	°22.0	82600 Cyanide, blood	80.0
°82315 fluorometric	°22.0	82605 tissue	80.0
82320 emission flame photometry	22.0	82615 Cystine, urine, qualitative	30.0
82325 atomic absorption flame photometry	24.0	82620 quantitative	40.0
82330 fractionated, diffusible	60.0	82630 Delta-amino levulinic acid (ALA), urine (see also 84120)	60.0
82335 urine, qualitative (Sulkowitch)	11.0	82640 Digitalis, blood	BR+
82340 24 hour quantitative	32.0	82645 urine	BR+
82345 feces, 24 hour quantitative	80.0	82655 Diphenolhydantoin (Dilantin), blood	80.0
82355 Calculus (stone) qualitative, chemical	40.0	82665 Duodenal contents, enzyme determination, each enzyme	30.0
82360 quantitative, chemical	60.0	(For chymotrypsin, see 82505)	
82365 infrared spectroscopy	60.0	(For intubation, see 89100)	
82370 X-ray defraction	50.0	82675 pH	10.0
(For carbon dioxide, see 82830, 82835, 82840, 82845)		82680 bicarbonate, quantitative	20.0
82375 Carbon monoxide, blood (see also 83025)	48.0	82690 Ethchlorvynol (Placidyl), blood	60.0
82380 Carotene, blood (see also 84595)	40.0	82695 urine	60.0
°82385 Cephalin flocculation, blood	°20.0	82705 Fat or lipids, feces, screening (see also 89120)	10.0
82390 Ceruloplasmin (copper oxidase), blood	40.0	82710 quantitative, 24 or 72 hour specimens	100.0
(For gel diffusion technique, see 86340)		82720 Fatty acids, blood, esterified	40.0
82400 Chloral hydrate, blood	60.0	82725 nonesterified	40.0
82405 urine	40.0	82735 Fluoride, blood	100.0
82415 Chloramphenicol, blood	40.0	82740 urine	100.0
82420 Chlordiazepoxide, blood	60.0	82745 Folic acid, blood	BR+
82425 urine	60.0	82750 Formimino-glutamic acid (FIGLU), urine	100.0
°82435 Chlorides, blood, chemical	°20.0	82760 Galactose, blood	40.0
82440 electrometric	20.0	82765 urine	40.0
82445 urine, chemical	20.0	82775 Galactose-1-phosphate uridyl transferase	60.0
		82800 Gases, blood, pH, arterial	20.0

	Unit Value		Unit Value
(For arterial puncture, see 36600)			
(For blood gas studies as a part of pulmonary function studies, see 94700-94710)			
82805	venous	20.0	
82820	PcO ₂ , arterial or venous by electrode	40.0	
82825	subsequent, same study, each	20.0	
82830	carbon dioxide content, volumetric method (Van Slyke)	30.0	
82835	subsequent, same study, each	20.0	
82840	by titration	20.0	
82845	subsequent, same study, each	12.0	
82850	O ₂ saturation, arterial blood, manometric method (Van Slyke)	40.0	
82855	subsequent, same study, each	30.0	
82860	spectrophotometric	40.0	
82865	subsequent, same study, each	30.0	
82870	by oximeter	20.0	
82875	subsequent, same study, each	16.0	
82880	Po ₂ , arterial blood, by electrode	40.0	
82885	subsequent, same study, each	30.0	
82890	Po ₂ , Pco ₂ and pH, arterial blood, by electrode	100.0	
82892	subsequent, same study, each	70.0	
82895	Pco ₂ , pH, (Astrup type), arterial or venous blood	90.0	
82900	subsequent, same study, each	60.0	
82910	pH, Pco ₂ and plasma bicarbonate, arterial or venous blood	90.0	
82915	subsequent, same study, each	60.0	
82925	Gastric analysis, chemical, single determination	16.0	
(For intubation, see 89130)			
82930	fractional, 5 specimens	44.0	
82935	with histamine or histalog	64.0	
82940	pepsin	60.0	
82945	analysis, tubeless (Diagnex Blue)	40.0	
(For globulin, see 84155-84200)			
(For glucose, see 84330)			
82955	Glucose-6-phosphate dehydrogenase, erythrocyte	60.0	
82965	Glutamate dehydrogenase, blood	40.0	
82975	Glutamine (glutamic acid amide), spinal fluid	80.0	
82985	Glycoprotein, blood, electrophoretic method	60.0	
82995	Gold, blood	100.0	
83005	Guanase, blood	40.0	
83010	Haptoglobin, blood	60.0	
83020	Hemoglobin, electrophoretic separation	80.0	
(For hemoglobin, colorimetric, see 85050)			
83022	A ₂		60.0
83025	carbon monoxide, quantitative		30.0
83030	F (fetal), chemical		40.0
83032	plasma		50.0
83035	S (sickle), chemical		50.0
83040	methemoglobin, electrophoretic separation		80.0
	qualitative		20.0
83045	quantitative		40.0
83050	sulfhemoglobin, qualitative		20.0
83055	quantitative		40.0
83060	Hemosiderin, urine		12.0
83070	Heroin, blood or urine, screening		80.0
83080	quantitative		120.0
83085	Histamine		100.0
83088	Homogentisic acid, urine, qualitative		20.0
83090	quantitative		40.0
83095	Hormones, adrenocorticotropin (ACTH), blood		BR+
83100	aldosterone, urine, double isotope dilution		240.0
83110	other methods		200.0
83115	catecholamines, blood		100.0
83120	urine, total		64.0
83125	fractionated into epinephrine and norepinephrine		100.0
83130	vanillyl mandelic acid (VMA), urine		60.0
83140	metanephrines, urine		60.0
83145	homo-vanillic acid (HVA), urine		80.0
83150	chorionic gonadotropin, pregnancy test, blood or urine, immunologic technic, qualitative		34.0
83160	quantitative		60.0
83165	animal test, mouse, rat, frog, qualitative		40.0
83170	rabbit		60.0
83175	bioassay, quantitative		120.0
83185	corticoids (17-OH corticosteroids), blood, fluorometric method, initial		60.0
83190	subsequent specimens, each, same study		24.0
83195	spectrophotometric method, initial		100.0
83200	subsequent specimens, each, same study		24.0
83210	urine (17-OH corticosteroids)		60.0
83215	estrogens, blood, total, nonpregnant state		BR+
83220	fractionated into estrone, estradiol and estriol by chromatography		BR+
83230	urine, total, nonpregnant state		60.0
83235	fractionated into estrone, estradiol and estriol		140.0
83240	estriol, pregnancy, blood		70.0

	Unit Value		Unit Value		
83245	urine	70.0	83585	urine	60.0
83255	ketogenic steriods, urine	60.0		(For ketoglutarate, see 82120)	
83260	tetra-hydro "S"	120.0	83595	Ketone bodies, blood, quantitative . .	40.0
83270	17-ketosteriods, blood, total	100.0	83605	Lactate, blood	40.0
83275	fractionated	200.0	83615	Lactic dehydrogenase (LDH), blood, kinetic ultraviolet method	26.0
83280	urine, total	50.0	°83620	colorimetric or fluorometric	°20.0
83285	chromatographic separation and quantitation	200.0	83625	isozymes, electrophoretic separation and quantitation	60.0
83290	alpha-beta separation	100.0	83630	chemical separation	20.0
83295	dehydro-epi-androsterone fraction	100.0	83635	urine	20.0
83300	with etiocholanolone fraction	160.0	83645	Lead, screening, blood	20.0
83310	pituitary gonadotropins (FSH) bio-assay	120.0	83650	urine	20.0
83320	pregnandiol, urine, chemical	60.0	83655	quantitative, blood	60.0
83325	chromatographic	60.0	83660	urine	60.0
83340	pregnantriol, urine, chemical	60.0	83670	Leucine amino-peptidase (LAP), blood, kinetic ultraviolet method	26.0
83345	chromatographic	60.0	83675	colorimetric	20.0
83350	progesterone, blood	BR+	83680	urine	26.0
83360	renin, blood	BR+	83690	Lipase, blood	30.0
83370	angiotensin, blood	BR+	83700	Lipids, blood, total	30.0
83380	growth hormone, blood	60.0	83705	and fractionated	60.0
83390	insulin, blood	40.0	83715	Lipoprotein, blood, electrophoretic separation and quantitation	60.0
83405	testosterone, blood	BR+		(For ultracentrifugation, analytic, see 82190)	
83410	urine	BR+	83725	Lithium, blood, quantitative	60.0
83420	thyroid, protein-bound iodine (PBI), blood	16.0	83735	Magnesium, blood, chemical	20.0
83425	butanol extractable iodine (BEI), blood	28.0	83740	fluorometric	20.0
83430	total iodine, blood	16.0	83750	atomic absorption	40.0
83435	urine-24 hour quantitative	20.0	83755	urine, chemical	40.0
83440	tri-iodo-thyronine (T-3) or thyroxine (T-4) uptake, radioactive	20.0	83760	fluorometric	40.0
83450	thyroxine (T-4), by column	28.0	83765	atomic absorption	40.0
83455	Murphy-Pattee or Nakajima free	BR+	83775	Malate dehydrogenase, kinetic ultraviolet method	30.0
83465	index (includes thyroxine by column and T-3 or T-4 uptake)	48.0	83785	Manganese, blood or urine	60.0
83470	binding globulin	64.0	83795	Melanin, urine, quantitative	60.0
83480	stimulating hormone (TSH)	BR+	83805	Meprobamate, blood or urine	60.0
83490	long-acting stimulator (LATS)	BR+	83815	Mercury, screening, blood	20.0
83500	Hydroxy-proline, urine, free	100.0	83820	urine	20.0
83505	total	100.0	83825	quantitative, blood	70.0
83510	free and total	180.0	83830	urine	70.0
83520	Icterus index, blood	16.0		(For metals, heavy, screening (Reinsch test), see 82177)	
83530	Inulin clearance	40.0	83850	Methanol, blood	60.0
83540	Iron, serum, chemical	20.0	83855	urine	60.0
	automated	12.0	83857	Methemalbumin	32.0
83546	radioactive uptake method	30.0	83860	Morphine, screening	80.0
83550	binding capacity, chemical	20.0	83861	quantitative	120.0
83555	automated	12.0	83865	Mucopolysaccharides, acid, urine	60.0
83565	radioactive uptake method	30.0	83870	Mucoprotein, blood (seromuroid)	40.0
83570	Isocitric dehydrogenase (IDH), blood, kinetic ultraviolet	26.0	83875	Myoglobin, urine	40.0
83575	colorimetric	20.0	83885	Nickel, urine	100.0
83580	Isopropyl alcohol, blood	60.0	83895	Nitrogen, urine, total, 24 hour specimen	60.0
			83900	feces, 24 hour specimen	100.0
			83910	Non-protein nitrogen, blood	20.0

	Unit Value		Unit Value	
83920	Ornithine carbonyl transferase, colorimetric	24.0	84245 urine	60.0
83930	Osmolality, blood	20.0	84255 Selenium, blood, urine or tissue	100.0
83935	urine	20.0	84260 Serotonin, blood	120.0
83945	Oxalate, urine	40.0	84265 urine (5 hydroxy indole acetic acid), 24 hour specimen	60.0
	(For alpha oxoglutarate, see 82120)		84275 Sialic acid, blood	50.0
	(For oxygen, see 82850-82900)		84285 Silica, blood, urine or tissue	100.0
83955	Para-amino hippuric acid (PAH), urine	20.0	°84295 Sodium, blood	°24.0
83965	Paraldehyde, blood, quantitative	60.0	°84300 urine	°24.0
83975	Pepsinogen, blood	40.0	84310 Sorbitol dehydrogenase, serum	26.0
83985	Pesticide, blood, urine or other material (see also 82480, 82482, 82484)	BR+	84320 Starch, feces, screening (see also 89120)	8.0
83995	Phenol, blood or urine	60.0		(For stone analysis see 82355-82370)
84005	Phenolsulphonphthalein (PSP), urine 2 specimens	20.0	°84330 Sugar (glucose), blood	°20.0
84010	specimens	40.0	84335 stick test	8.0
	(For injection procedure, see 36410)		84340 tolerance, up to 5 specimens, 3 hours	60.0
84020	Phenothiazine, urine	100.0	84345 up to 9 specimens, 7 hours	80.0
84030	Phenylalanine, blood, Guthrie fluorometric	12.0	84350 tolbutamide tolerance (includes injection)	60.0
84040	Phenylketone, urine	10.0	84355 insulin tolerance (includes injection)	60.0
84050	Phenylpyruvic acid, urine	20.0	84360 intravenous tolerance (includes injection)	100.0
°84060	Phosphatase, acid, blood	°24.0	84365 urine, quantitative, 24 hour specimen	20.0
84065	tartrate (prostatic) fraction	40.0	84370 fermentation	20.0
°84075	alkaline, blood	°24.0	84375 chromatographic separation	80.0
84080	fractionated	BR+	84380 spinal or joint fluid	20.0
84090	Phospholipids, blood	30.0	84390 Sulfobromophthalein (BSP), blood	32.0
°84100	Phosphorus, blood	°24.0		(For injection procedure, see 36410)
°84105	urine	°24.0	84400 Sulfonamide, blood	20.0
84110	Porphobilinogen, urine, quantitative	20.0	84410 Thallium, blood or urine	100.0
84120	Porphyrins, urine, fractionated (uroporphyrin and coproporphyrin)	64.0	84420 Theophylline, blood	60.0
	(For porphyrin precursors, see 82630)		84430 Thiocyanate, blood	30.0
84130	feces, quantitative	100.0	°84440 Thymol turbidity, blood	°20.0
°84140	Potassium, blood	°24.0	84450 Transaminase, blood, glutamic oxaloacetic (SGOT), timed kinetic ultraviolet method	24.0
°84145	urine	°24.0	°84455 colorimetric or fluorometric	°20.0
°84155	Protein, total, serum, chemical	°20.0	84460 glutamic pyruvic (SGPT), timed kinetic ultraviolet	24.0
84160	refractometric	12.0	°84465 colorimetric or fluorometric	°20.0
84165	electrophoretic fractionation and quantitation	60.0	84475 Triglycerides, blood	30.0
°84170	total and albumin/globulin ratio	°40.0	84477 automated	20.0
84175	other sources, quantitative	24.0	84485 Trypsin, duodenal fluid	30.0
84180	urine, quantitative, 24 hour specimen	24.0	84490 Trypsin, feces, quantitative, 24 hour specimen	30.0
84185	Bence-Jones	12.0	84500 Tubular reabsorption of phosphate, blood and urine (see also 84100, 84105)	60.0
84190	electrophoretic fractionation and quantitation	80.0	84510 Tyrosin, blood	40.0
84195	spinal fluid	20.0	°84520 Urea nitrogen, blood	°22.0
84200	electrophoretic fractionation and quantitation	80.0	84525 stick test	8.0
84210	Pyruvate, blood	30.0	°84540 urine	°20.0
84220	Pyruvic-kinase, blood	30.0	°84545 clearance	°40.0
84230	Quinidine, blood	40.0	°84550 Uric acid, blood, chemical	°20.0
84240	Salicylates, blood	30.0		

	Unit Value		Unit Value
84555 uricase, ultraviolet method	26.0	85230 factor VII (proconvertin)	40.0
84560 urine, chemical	20.0	85240 factor VIII (AHG)	40.0
84565 Urobilin, urine, qualitative	12.0	85250 factor IX (PTC or Christmas)	40.0
84570 quantitative, timed specimen	24.0	85260 factor X (Stuart-Prower)	40.0
84575 feces, quantitative, 24 hour specimen	60.0	85270 factor XI (PTA)	40.0
84580 Urobilinogen, urine, quantitative, timed specimen	24.0	85280 factor XII (Hagemann)	40.0
84590 Vitamin A, blood	40.0	85290 factor XIII (fibrin stabilizing)	40.0
84595 including carotene (see also 82380)	60.0	85300 Clotting inhibitors or anti-coagulants, anti-thrombin	40.0
(For vitamin B-12, isotope method, see 78100)		85310 anti-thromboplastins	40.0
84605 Volume, blood, dye method (Evans blue)	30.0	85320 anti-prothromboplastins	40.0
84610 including total plasma and total blood cell volume	50.0	85330 anti-factor VIII	40.0
(For isotope method, see 78110, 78111)		85340 cross recalcification time	40.0
84620 Xylose tolerance test, blood	40.0	85345 Coagulation time (Lee and White)	30.0
84630 Zinc, quantitative, blood	100.0	85347 Coagulation time, activated	20.0
84635 urine	100.0	85350 Eosinophile count	12.0
84645 Zinc sulphate turbidity, blood	20.0	85360 Euglobulin	40.0
[Order 74-7, § 296-23-212, filed 1/30/74.]		85370 Fibrinogen, qualitative (F-Y test)	12.0
		85375 quantitative	40.0
		85390 Fibrinolysins, screening	20.0
		85395 semi-quantitative	30.0
		85400 Fibrinolytic mechanisms, plasmin	BR+
		85410 anti-plasmin	BR+
		85420 plasminogen	BR+
		85430 plasminogen activator	BR+

WAC 296-23-216 Hematology.

	Unit Value		Unit Value
(Includes blood clotting (coagulation) procedures)		(For hematocrit (pcv), see 85055)	
85000 Bleeding time	10.0	(For hemoglobin, see 83020-83060, 85050)	
85010 Blood count, complete (includes rbc, wbc, hgb, differential)	24.0	85520 Heparin assay	60.0
85015 automated, cell counts, hematocrit, hemoglobin and indices	12.0	85530 Heparin-protamine tolerance test	60.0
85020 red blood cell count (rbc)	8.0	85540 Leucocyte alkaline phosphatase	20.0
85030 white blood cell count (wbc)	8.0	85580 Platelet, count (Rees-Ecker)	14.0
85040 differential (wbc) count	8.0	85590 phase microscopy	20.0
85050 hemoglobin, colorimetric	8.0	85595 electronic technic	20.0
(For other hemoglobin determinations, see 83020-83060)		85600 adhesiveness	60.0
85055 Hematocrit	8.0	85610 Prothrombin time	16.0
85060 Hemogram: mcv, mch, mchc, calculations based on rbc, hgb, and pcv	8.0	85615 Prothrombin utilization (consumption)	40.0
85100 Bone marrow, aspiration and interpretation of smears	140.0	85620 Red blood cell, osmotic fragility, screening	20.0
85105 interpretation only	100.0	85621 incubation	60.0
85110 aspiration only, needle or trochar	40.0	85630 size (Price-Jones)	40.0
85150 Calcium clotting time	40.0	85640 Reticulocyte count	14.0
85160 Calcium saturation clotting test	40.0	85650 Sedimentation rate (esr)	14.0
85165 Capillary fragility test (Rumpel-Leede) (independent procedure)	20.0	85660 Sickling of red blood cells	14.0
85170 Clot retraction	8.0	85670 Thrombin time, plasma	20.0
85200 Clotting factors, plasma, specific, factor I (fibrinogen)	40.0	85680 Thrombo test	20.0
85210 factor II (prothrombin assay)	40.0	85700 Thromboplastin generation test, screening (Hicks-Pitney)	40.0
85220 factor V (AcG or pro-accelerlin)	40.0	85720 all factors	BR+
		85730 Thromboplastin time, partial (PTT)	30.0
		85732 plasma	30.0
		85734 serum	30.0
		(For tourniquet test, see 85165)	
		85810 Viscosity, blood	40.0
		85820 serum	40.0

[Order 74-7, § 296-23-216, filed 1/30/74. Formerly
WAC 296-23-210.]

WAC 296-23-221 Immunology.

	Unit Value
(Includes serology, immuno-hematology and blood banking)	
86000 Agglutination, routine, febrile, each antigen	14.0
86010 maximum series (includes typhoid O & H, paratyphoid A & B, brucella and proteus (OX-19)	60.0
86020 Antibody screening test	10.0
86025 titre: Rh, A, B, leucocyte, platelet or others, albumin or saline technic, each	20.0
86030 Anti-desoxyribonuclease titre (DNA)	40.0
86040 Anti-hyaluronidase titre	60.0
86050 Anti-nuclear antibodies	40.0
86060 Anti-streptolysin O titre	20.0
86065 Anti-streptokinase titre	80.0
86070 Blood, cross match, per unit	60.0
(For blood transfusion, see 36430-36460)	
86080 grouping A & B	12.0
86090 M & N	20.0
86100 Rh typing	12.0
86110 subtypes, each	16.0
86120 special (Kell, Duffy, etc.)	BR+
86130 anti-Rh immuno-globulin testing (Rhogam type)	68.0
86140 C-reactive protein	20.0
86150 Cold agglutinins, quantitative	40.0
86160 Complement, quantitative, by gel diffusion, each fraction	60.0
86170 Complement fixation, precipitin, or agar gel test, coccidioidomycosis	40.0
86180 histoplasmosis	40.0
86190 leptospirosis	40.0
86200 rubella	40.0
86210 streptococcus MG	40.0
86220 tularemia	40.0
86230 psittacosis or cat-scratch fever	40.0
86250 Coombs test, direct	20.0
86260 indirect, qualitative	30.0
86270 quantitative	50.0
86280 Hemagglutination inhibition	60.0
86290 Hemolysins, ox cell	28.0
86300 Heterophile antibodies, screening (includes mono-type test)	20.0
86310 absorption, beef cells and guinea pig kidney	30.0
(For hormones, see 83100-83490)	
86320 Immuno-electrophoresis, serum	100.0
86325 urine	100.0
86330 Immuno-globulins, quantitative by gel diffusion, IgA, IgD, IgE, IgG and IgM, each	60.0
86340 transferrin and ceruloplasmin	80.0

(For chemical method, see 83290)

86350 Latex fixation, anti-nuclear protein ..	30.0
86355 L-E factor, slide test	20.0
86360 rheumatoid factor	40.0
86370 thyroglobulin antibody	40.0
86375 trichinella antibody	20.0
86380 L-E cells, smear method	40.0
86390 Precipitin test for blood (species identification)	BR+
86394 Rubella, H-I, single test	56.0
86395 two tests, same patient	80.0
86396 Rubella, C-F, single test	BR+
86397 two tests, same patient	BR+
86400 Serologic test for syphilis, complement fixation (Kolmer or RPCF), quantitative	20.0
86410 flocculation or precipitin (VDRL, etc.), qualitative	12.0
86420 quantitative	20.0
86450 Skin test, actinomycosis	20.0
86460 blastomycosis	20.0
86470 brucellosis	20.0
86480 cat-scratch fever	20.0
86490 coccidioidomycosis	20.0
86500 echinococcosis	20.0
86510 histoplasmosis	20.0
86520 leptospirosis	20.0
86530 lymphopathia venereum (Frei test) ..	20.0
86540 mumps	20.0
86550 psittacosis	20.0
86560 sarcoidosis	20.0
86565 Kveim test, includes skin test only	BR+

(For biopsy see 11100, for microscopic study, see 88310)

86570 trichinosis	20.0
86580 tuberculosis	20.0
86585 tine test	12.0

(For allergy testing, see 95000-95090)

86600 Toxoplasmosis dye test	80.0
86650 Treponema antibodies, fluorescent, absorbed (FTA-abs)	30.0
86660 Treponema pallidum immobilization (TPI)	80.0

[Order 74-7, § 296-23-221, filed 1/30/74.]

WAC 296-23-224 Microbiology.

	Unit Value
(Includes bacteriology, mycology, parasitology and virology)	
87000 Initial microscopic examination, stain for bacteria, fungi, parasites, ova, inclusion bodies, any source	20.0

	Unit Value		Unit Value
87010	20.0	88000	400.0
87015	20.0	88010	600.0
87050	48.0	88020	800.0
87055	80.0	88030	1000.0
87080	16.0	88035	BR+
87085	50.0	88100	30.0
87090	16.0	88105	40.0
87095	80.0	88110	40.0
87100	60.0	88120	BR+
87110	40.0	88130	40.0
87120	50.0	88140	40.0
87130	80.0	88200	BR+
87140	20.0	88250	BR+
87150	40.0	88300	20.0
87160	20.0	88310	60.0
87170	BR+	88315	BR+
87180	40.0	88320	140.0
87190	60.0	88325	BR+
87195	20.0	88330	100.0
87200	BR+	88335	BR+
		88400	200.0

(For electron microscopy, see 88200)

(For inclusion bodies in tissue sections, see 88310)

87300	140.0
87350	60.0
87355	100.0
87400	80.0

[Order 74-7, § 296-23-224, filed 1/30/74. Formerly WAC 296-23-205.]

[Order 74-7, § 296-23-228, filed 1/30/74. Formerly WAC 296-23-240.]

WAC 296-23-228 Anatomic pathology.

WAC 296-23-232 Miscellaneous.

	Unit Value
(For Achilles tendon reflex test (ART), see 95930)	
89000 Basal metabolic rate (BMR)	40.0
89050 Cell count, miscellaneous body fluids (except blood)(e.g., CSF, joint fluid, etc.)	12.0
89051 with differential	20.0
89080 Colloidal gold, spinal fluid	20.0
89100 Duodenal intubation and aspiration (independent procedure)	40.0
89105 double lumen tube (pancreatic-zy- mase secretion test), 12 hr. secreto- ry for Zollinger-Ellison syndrome	BR+
(For chemical analyses, see 82665-82680)	
(For electrocardiogram, see 93000-93045)	
89110 Esophagus acid perfusion test	BR+
89120 Feces, appearance, occult blood, screening for starch and fat	20.0
89130 Gastric intubation and aspiration (in- dependent procedure)	20.0
(For washing for cytology, see 88120)	
(For chemical analyses, see 82925-82945)	
(For joint fluid chemistry, see Chemistry and Toxi- cology, this section)	
89150 Leucocyte and tissue typing (e.g., organ transplantation)	BR+
89200 Paternity test, per individual (A,B,M,N,C,c,D,E,e)	100.0
89201 additional factors	BR+
(For pregnancy test, see 83160-83175)	
89300 Semen analysis, presence or absence of sperm or motility only, including Huhner test	12.0
89310 motility and count	40.0
89320 complete (volume, count, motility and differential)	80.0
(For skin test, see Immunology, WAC 296-23-221, and Allergy, WAC 296-21-075)	
89350 Sputum, obtaining specimen, aerosol induced technique (independent pro- cedure)	20.0
89360 Sweat test by iontophoresis	50.0

[Order 74-7, § 296-23-232, filed 1/30/74.]

HOSPITAL

WAC 296-23-300 General statement. To enable us to pay your bills more promptly we must have your cooperation. There is often delay in processing hospital bills because the claim number is not listed in the space provided on the bill form. The department provides the claim number to the attending physician immediately after our receipt of a new report of accident. The claim number is sent out prior to the adjudication of the claim.

Please make arrangements with the physicians in your area to supply you with the claim number when arrangements are made for hospitalization. If the attending physician cannot supply you with the claim number then no portion of a claim has been filed with the department.

If for some reason you are not able to secure the claim number, the bill should not be held but should be forwarded to the department in Olympia or to the self-insurer supplying all information requested on the heading of the bill. Do not confuse the date of injury with the date of admission. We urge you to submit your bills to the department or self-insurer at the end of each month for the services rendered that month. [Order 75-39, § 296-23-300, filed 11/28/75, effective 1/1/76; Order 68-7, § 296-23-300, filed 11/27/68, effective 1/1/69.]

HOSPITAL RULES

WAC 296-23-301 Rates for daily and ancillary services. The department or self-insurer will pay rates for daily and ancillary services as approved by the Washington State Hospital Commission. [Order 76-34, § 296-23-301, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-301, filed 11/28/75, effective 1/1/76.]

WAC 296-23-305 Questionable beneficiary. It is the responsibility of the hospital to try to determine at the time of admission, if the injured worker is covered under the industrial insurance Act and if the hospitalization is for an industrial condition.

In cases where a worker with a questionable industrial injury has paid the hospital, and it is subsequently determined that the worker should have been covered by industrial insurance, the hospital must bill the department for services rendered and refund to the worker, the full amount collected from him. [Order 76-34, § 296-23-305, filed 11/24/76, effective 1/1/77; Order 70-12, § 296-23-305, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-305, filed 11/27/68, effective 1/1/69.]

WAC 296-23-310 Refund of incorrect payments. When the department has paid a hospital account and it is later determined that the service performed was not the responsibility of the department, the department will attempt to collect from the claimant. Failing to collect from the claimant, the department will than [then] deduct from future HOSPITAL PAYMENTS. [Order 68-7, § 296-23-310, filed 11/27/68, effective 1/1/69.]

WAC 296-23-315 Treatment of unrelated conditions. Treatment or surgery for unrelated conditions, while the injured workman is hospitalized are not usually allowed. Diagnostic tests and/or treatment for unrelated conditions directly affecting recovery of the industrial condition may be given consideration as outlined under WAC 296-20-055.

Diagnostic tests and studies ordered by the attending physician as a part of the initial care and diagnosis of an industrial injury, will be allowed. [Order 70-12, § 296-23-315, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-315, filed 11/27/68, effective 1/1/69.]

WAC 296-23-330 Closed claims. The department will not pay for services rendered after the claim has been closed. If responsibility is later accepted by the department, WAC 296-23-305 will apply. [Order 74-7, § 296-23-330, filed 1/30/74; Order 70-12, § 296-23-330, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-330, filed 11/27/68, effective 1/1/69.]

WAC 296-23-335 RX's take home. Take home prescriptions will be authorized upon discharge of the patient if the medication is necessary for the industrial condition. [Order 76-34, § 296-23-335, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-335, filed 11/28/75, effective 1/1/76; Order 68-7, § 296-23-335, filed 11/27/68, effective 1/1/69.]

WAC 296-23-340 Routine laboratory procedures on admission. On admission of an industrially injured patient to a hospital, the department or the self-insurer will allow routine laboratory work-up consisting of a complete blood count or hematocrit, urinalysis, serology and routine admission chemical screening procedure. Laboratory reports for the procedures accomplished must accompany the bill. [Order 76-34, § 296-23-340, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-340, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-340, filed 11/22/74, effective 1/1/75; Order 68-7, § 296-23-340, filed 11/27/68, effective 1/1/69.]

WAC 296-23-356 Billing procedures. (1) Bills must specify the date, description of services and the charge for each service. These must be itemized using either the department or self-insurer form, as the case may be. Computer billing will not be acceptable unless description of services is easily readable without special knowledge or coding system. (See subsection (11) below)

(2) If computer billing is used, it must be securely fastened to a department or self-insurer bill form. The bill form must be completed in detail.

(3) For a bill to be considered for payment, it must be received in the department or by the self-insurer within ninety days from the date each specific treatment and/or service or procedure was rendered or performed.

(4) Diagnostic reports must accompany all bills for x-ray services.

(5) Bills for laboratory work must be accompanied by copies of the reports of findings.

(6) A copy of the admission record, the doctor's admission history and physical examination, must be submitted with the bill for each hospital admission.

(7) The department or the self-insurer, may reject bills for services rendered in violation of the medical aid rules.

(8) The emergency room will be considered the office for those physicians providing regular emergency room care to the hospital, and fees will be allowed on this basis.

(9) Call back between 6 p.m. and 8 a.m. provided that laboratory, x-ray and surgical staff are normally not on duty during this period of time will be billed at commission approved rates.

(10) Bills for physical therapy and x-rays will be at commission approved rates.

(11) The claim number must be placed on each bill and on each page of attached documents. [Order 77-27, § 296-23-356, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-356, filed 12/1/77; Emergency Order 77-16, § 296-23-356, filed 9/6/77; Order 76-34, § 296-23-356, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-356, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-356, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-356, filed 1/30/74; Order 71-6, § 296-23-356, filed 6/1/71; Order 70-12, § 296-23-356, filed 12/1/70, effective 1/1/71. Formerly WAC 296-23-355 (part).]

WAC 296-23-357 X-rays. (1) Radiographs are required for comparison and interpretation in determining permanent disability, other administrative or legal decisions, and for cases in litigation and must be retained for a period of seven years.

(2) X-rays must be made available upon request to consultants, to medical examiners, to the department, to self-insurers and/or the board of industrial insurance appeals.

(3) If a hospital ceases to function as an acute care facility, department approved custodial arrangements must be made to insure availability of x-rays on request. [Order 77-27, § 296-23-357, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-357, filed 12/1/77; Emergency Order 77-16, § 296-23-357, filed 9/6/77; Order 76-34, § 296-23-357, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-357, filed 1/30/74.]

HOSPITAL FEES

WAC 296-23-395 Recovery room—Use of.

	Unit Value
(1) First hour or fraction thereof	2.0
(2) Each subsequent 30 minutes	0.7
(3) Maximum	4.8

[Order 74-7, § 296-23-395, filed 1/30/74; Order 68-7, § 296-23-395, filed 11/27/68, effective 1/1/69.]

CHIROPRACTIC

WAC 296-23-610 General instructions. (1) Fees cover services and reports in all cases that can qualify for worker's compensation benefits. This fee schedule is intended to cover all examinations, reports and treatment.

(2) The maximum fee is determined by multiplying the unit value of a procedure by a conversion factor. Individual conversion factor tables apply to separate sections of the maximum fee schedule when such an item or procedure is used in the care and treatment of an industrial injury.

(3) Initial and follow-up visit charges by chiropractors shall include chiropractic manipulation or adjustment.

(4) Communications to the department must show the patient's full name and claim number if known. If the claim number is unknown, in addition to the patient's name, show the date and the nature of the injury and the employer's name. A communication should refer to one claim only. Correspondence regarding chiropractic services should be sent directly to the department in Olympia or self-insurer in order to avoid rehandling by the service location.

(5) **LIGHT WORK:** The attending chiropractor is urged to bear in mind that light work is frequently beneficial for body conditioning and the gaining of self-confidence. Accordingly, where light work is available and whenever an employer requests that a worker be certified by a chiropractor as able to perform available work other than his usual work, the employer shall furnish to the physician, with a copy to the worker, a statement describing the available work in terms that will enable the physician to relate the physical activities of the job to worker's disability. The physician shall then determine whether the worker is physically able to perform the work described.

(6) **REGULAR WORK:** When the attending chiropractor determines that the patient is capable of returning to his regular work he should be informed and the department or self-insurer notified as to the specific date. Compensation will be terminated on this date. Further care will be allowed as outlined in WAC 296-23-61005.

(7) **TERMINATION OF CHIROPRACTIC CARE.** When chiropractic care is no longer required and the industrial condition stabilized, a report must be submitted to the department or self-insurer to this effect stating the specific date. This is necessary for closure of the industrial claim, even though the patient may require continued care for conditions not related to the industrial condition.

(8) **PERMANENT DISABILITY.** When the patient has, in the opinion of the attending chiropractor, a permanent partial disability or measurable impairment of function, the attending chiropractor should notify the department or self-insurer so that an examination can be scheduled to determine the extent of impairment. [Order 76-34, § 296-23-610, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-610, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-610, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-610, filed 1/30/74; Order 71-6, § 296-23-610, filed 6/1/71; Order 70-12, § 296-23-610, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-610, filed 11/27/68, effective 1/1/69.]

WAC 296-23-61001 Who may treat. All licensed chiropractors, except those under suspension by the department, are eligible to treat injured workers entitled to benefits under the Industrial Insurance Law. Chiropractic treatment of industrially injured workers is limited to the scope of practice as set forth in chapter 18.25 RCW.

No chiropractor shall be formally refused permission to treat cases coming under the jurisdiction of the department or the self-insurer, except for reasons that are, in the opinion of the department or self-insurer, to the best interest of the workers and the funds which were created for their protections.

Reasons for holding a chiropractor ineligible to treat industrial insurance cases include, but are not necessarily limited to, any one or a combination of the following:

(1) Failure, neglect or refusal to submit completed, adequate and detailed reports.

(2) Failure, neglect or refusal to respond to requests by the department or the self-insurer for additional reports.

(3) Failure, neglect or refusal to observe and comply with the department's orders and medical aid rules.

(4) Persistent failure to recognize emotional and social factors impeding recovery of the injured worker.

(5) Submission of false or misleading reports to the department or to the self-insurer.

(6) Collusion with any other persons in submission of false or misleading information to the department or to the self-insurer.

(7) Submission of inaccurate or misleading bills.

(8) Persistent submission of false or erroneous diagnosis.

(9) Knowingly submitting bills to an injured worker for treatment of an industrial condition for which the department or self-insurer has accepted responsibility.

(10) Charging or attempting to charge industrially injured workers any fee for care of conditions for which the department or self-insurer has accepted responsibility.

(11) Conviction in any court of any offense involving a moral turpitude, in which case the record of such conviction shall be conclusive evidence.

(12) The use or prescription for use of narcotic, addictive, habituating or dependence producing drugs.

(13) Repeated acts of gross misconduct in the practice of the profession.

(14) Declaration of mental incompetency by a court of competent jurisdiction. [Order 76-34, § 296-23-61001, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61002 Acceptance of rules and fees.

The filing of an accident report or the rendering of treatment to an injured worker who comes under the department's or self-insurer's jurisdiction, as the case may be, constitutes acceptance of the department's medical aid rules and shall comply with its rules and fees.

In accordance with RCW 51.28.020 of the Industrial Insurance Law, when a chiropractor renders treatment to an injured worker entitled to benefits under the law, "it shall be the duty of the physician to inform the injured worker of his rights under this title and to lend all necessary assistance in making this application for compensation and such proof of other matters as required by the rules of the department without charge to the workman." An injured worker shall not be billed for treatment rendered for his industrial injury or occupational disease.

When an unrelated condition is being treated concurrently with an industrial injury, the department or self-insurer shall be notified immediately by the treating chiropractor of the nature of the unrelated condition and the treatment being rendered and the effect, if any, on the patient's recovery from the industrial injury.

In cases of questionable beneficiary where the treating chiropractor has billed the injured worker, and the claim is subsequently allowed, the chiropractor shall refund the injured worker in full and bill the department or self-insurer for services rendered at department rates.

Cases in which there is a question of professional ethics or quality of treatment, will be referred for peer review by the appropriate professional society, committee or organization.

This is a maximum fee schedule. All fees listed are the maximum fees allowable and if a fee for any particular service is lower to the general public than listed in the fee schedule, the practitioner shall bill the department or self-insurer at the lower rate. [Order 76-34, § 296-23-61002, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61003 Penalties. RCW 51.48.060 of the Industrial Insurance Law provides that a civil penalty of \$100.00 may be assessed against any physician who; "—fails, neglects or refuses to file a report with the director, as required by this title, within five days of treatment showing the condition of the injured workman at the time of treatment, a description of the treatment given, and an estimate of the probable duration of the injury, or who fails or refuses to render all necessary assistance to the injured workman, as required by this title,— —."

RCW 51.48.080 of the Industrial Insurance Law provides that, "Every person, firm or corporation who violates or fails to obey, observe or comply with any rule of the department promulgated under authority of this title, shall be subject to a penalty of not to exceed two hundred and fifty dollars". [Order 76-34, § 296-23-61003, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61004 Initial treatment and report of accident. It is the responsibility of each chiropractor accepting an industrial injury for treatment, to ascertain whether he is the first attending chiropractor. If not, he must refer the worker to the original chiropractor, unless the worker desires to be transferred to his care. In this event, approval for the transfer must be obtained in accordance with WAC 296-23-61009.

If the chiropractor is the first attending chiropractor, he will take the following action:

- (1) Give emergency treatment.
- (2) Immediately complete and forward the report of the accident, to the department or the self-insurer, as the case may be, and the employer. Instruct and give assistance to the injured worker in completing his portion of the report of accident. The following information is necessary so that there is no delay in adjudication of the claim or payment of compensation.

- (a) Complete history of the industrial accident.
- (b) Complete listing of positive chiropractic findings.

(c) Specific chiropractic diagnosis relating to the injury.

(d) Types of treatment rendered.

(e) Chiropractic conditions which may influence recovery or cause complications.

(f) Estimate time loss due to the injury.

(3) If the patient remains under your care continue with necessary treatment in accordance with medical aid rules.

(4) An additional chiropractic manipulation may be allowed and paid on not more than the initial and the first two subsequent visits, provided that they are justified by a detailed report on the condition requiring the additional treatment. [Order 76-34, § 296-23-61004, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61005 Treatment following initial treatment. (1) Up to ten office calls for treatment of the industrial injury will be allowed without authorization during the first thirty days following initial treatment.

(2)(a) If necessary, x-rays immediately prior to and immediately following the initial chiropractic treatment may be taken without prior authorization.

(b) X-rays immediately prior to and immediately following subsequent chiropractic treatment will be disallowed, unless previously authorized.

(c) Prior authorization must be obtained for x-rays subsequent to initial treatment.

(d) Payment will not be made for excessive or unnecessary x-rays. No payment will be made for x-rays taken on rejected or closed claims, except those taken in conjunction with a reopening application.

(e) See WAC 296-23-01002 for custody requirements for x-rays.

(3) Prior authorization for chiropractic therapy in excess of ten treatments must be obtained. Authorization will only be granted when there is sufficient evidence that treatment requested will result in improvement of the industrial condition.

(4) Chiropractic therapy as a palliative or maintenance measure will not be paid. [Order 77-27, § 296-23-61005, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-61005, filed 12/1/77; Emergency Order 77-16, § 296-23-61005, filed 9/6/77; Order 76-34, § 296-23-61005, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61006 Rejected and closed claims. (1) Except for services requested by the department or the self-insurer or diagnostic procedures forming the basis for action on a claim, no payment for treatment or medication will be made in claims for which responsibility has not been accepted (rejected).

(2) When a claim is closed the only services for which payment will be made are those services requested by the department or the self-insurer and/or the examination, along with necessary diagnostic procedures, in connection with the submission of an application to reopen a claim for aggravation. [Order 76-34, § 296-23-61006, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61007 Treatment beyond 60 days.

Conditions requiring treatment beyond sixty days are indicative of a major industrial condition or complication by other pathology. Except in cases of severe and extensive injuries, when the worker is unable to return to work within sixty days, the department or the self-insurer, as the case may be, may request a complete examination to determine and/or establish:

(1) What, if any, other pre-existing or concurrent conditions exist in addition to the industrial injury.

(2) What effect, if any, the unrelated conditions have on the industrial injury.

(3) The full extent, diagnosis, probable duration, anticipated treatment and prognosis of those conditions.

This examination may be conducted by a consultant from the list of chiropractic consultants as approved by the Washington State Board of Chiropractic Examiners, provided that if conditions are outside the scope and field of chiropractic, then the examination must be conducted by an appropriate medical or osteopathic specialty. [Order 76-34, § 296-23-61007, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61008 Doctor's supplemental report.

The department or the self-insurer will make periodic requests for the chiropractor to submit a supplemental report. When requesting a report the department or the self-insurer will forward a "Doctor's Supplemental Report" form to be completed and returned to the department or self-insurer. It is intended that this report contain sufficient information to allow the department or self-insurer to authorize treatment, pay time loss compensation and medical bills without requiring additional correspondence from the chiropractor. When the report is completed in adequate detail for this purpose and returned promptly, the department or self-insurer will pay for its completion.

Billing for the report must be submitted in accordance with the procedures outlined in WAC 296-23-61011. [Order 76-34, § 296-23-61008, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61009 Transfer of practitioners.

All transfers from one practitioner to another must be approved by the department or self-insurer. Normally transfers will be allowed only after the worker has been under the care of the attending chiropractor for sufficient time for him to establish an appropriate treatment regimen and to evaluate the efficacy of the therapeutic course.

X-rays will be forwarded to the new attending chiropractor or attending physician.

The department and the self-insurer reserves the right to require a worker to select another physician or specialist for treatment, under the following conditions:

(1) When more conveniently located chiropractors, qualified to provide the necessary treatment, are available.

(2) When the attending chiropractor fails to cooperate in observance and compliance with department rules.

(3) In time loss cases where reasonable progress toward return to work is not shown.

(4) Cases requiring specialized treatment, which the attending practitioner is not qualified to render.

(5) Where the department or the self-insurer finds a transfer of practitioners to be appropriate and has requested the worker to transfer, the department or the self-insurer may select a new practitioner if the worker unreasonably refuses or delays in selecting another practitioner.

Transfer will be authorized for the foregoing reasons or where the department or the self-insurer in its discretion finds that a transfer is in the best interest of returning the injured worker to a productive role in society.

(6) In cases where the practitioner is qualified to treat each of several conditions which the attending practitioner is not qualified to treat. [Order 77-27, § 296-23-61009, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-61009, filed 12/1/77; Emergency Order 77-16, § 296-23-61009, filed 9/6/77; Order 76-34, § 296-23-61009, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61010 Concurrent treatment.

Treatment by more than one practitioner concurrently will be allowed only when the conditions resulting from the injury involve more than one system requiring specialty care, and when approved by the attending practitioner. When more than one practitioner are providing care, the department shall designate one as the attending practitioner. [Order 76-34, § 296-23-61010, filed 11/24/76, effective 1/1/77.]

WAC 296-23-61011 Billing procedures.

(1) Bills must be itemized on the department or self-insurer forms, as the case may be, specifying the date, type of service and charges for each service.

(2) The bill form must be completed in detail and include the claim number. The account number and name of the chiropractor rendering service must be included on the bill. Bills will be accepted when signed by other than the chiropractor rendering service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges, rests with the chiropractor rendering the service.

(3) For a bill to be considered for payment, it must be received in the department or by the self-insurer within ninety days from the end of the month in which the service was rendered.

(4) Bills for x-ray services must be submitted in conformance with the fees for the particular service as specified in the radiological portion of the maximum fee schedule. Diagnostic reports must accompany the bill.

(5) Except for services requested by the department, completion of a reopening examination and application is the only service for which payment may be made while a claim is closed. **UNDER NO CIRCUMSTANCES CAN BILLS BE PAID FOR ANY OTHER SERVICES RENDERED WHILE A CLAIM IS CLOSED.**

(6) The department or the self-insurer may reject bills for services rendered in violation of the medical aid

rules. [Order 77-27, § 296-23-61011, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-61011, filed 12/1/77; Emergency Order 77-16, § 296-23-61011, filed 9/6/77; Order 76-34, § 296-23-61011, filed 11/24/76, effective 1/1/77.]

WAC 296-23-615 Office visits. The following services are generally part of the basic services listed in the maximum fee schedule but do involve additional expenses to the chiropractor for materials, for his time or that of his employees. These services are generally provided as an adjunct to common chiropractic services and should be used only when circumstances clearly warrant an additional charge over and above the usual charges for the basic services.

	Unit Value
C99030 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
C99052 Services requested between 6:00 P.M. and 8:00 A.M. in addition to basic services, provided the office is closed during this period of time	12.0
C99054 Services requested on Sundays and holidays in addition to basic services	12.0
C99082 Completion of Certificate of Disability Card	2.0

NEW PATIENT

C90000 Routine examination, history, chiropractic manipulation and submission of a report and/or if immediately following an injury, submission of Report of Accident	25.0
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FOLLOW-UP TREATMENT

C90010 Office visit including chiropractic manipulation	16.0
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[Order 76-34, § 296-23-615, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-615, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-615, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-615, filed 1/30/74; Order 68-7, § 296-23-615, filed 11/27/68, effective 1/1/69.]

WAC 296-23-620 Consultations.

	Unit Value
C90020 Chiropractic consultation, upon prior authorization by the Department from an approved list of chiropractic consultants	50.0

[Order 76-34, § 296-23-620, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-620, filed 1/30/74; Order 68-7, § 296-23-620, filed 11/27/68, effective 1/1/69.]

PHYSICAL THERAPY

WAC 296-23-710 Physical therapy rules.

RULE 1

Physical therapy treatment will be permitted only when given by a registered physical therapist or a physical therapist assistant serving under the direction of a registered physical therapist upon written prescription by a physician. In remote isolated areas, where no registered physical therapist is available, with prior authorization from the department or the self-insurer, physical modalities in 97000 will be allowed when given in a physician's office, hospital or nurse practitioner clinic. (See WAC 296-21-095, 97070 in Medicine section.) Use of diapulse or similar machine on persons under jurisdiction of the department or the self-insurer is not authorized.

RULE 2

A physical therapy progress report must be submitted to the physician prescribing the treatment; a copy must be sent to the department or the self-insurer also. This report is to be completed after 12 treatment visits or one month, whichever occurs first. Payment for the treatment is contingent upon receipt of the report within the department or the self-insurer, as the case may be, within 15 days of completing the 12 visits or one month.

RULE 3

Upon prior justification and approval by the department, or self-insurer, separate noncontiguous areas requiring individual treatment or other special procedures will be allowed at full unit value for each area with a maximum of two areas allowed.

RULE 4

Physical therapy in the home will be allowed only upon prior approval and authorization by the department or self-insurer.

RULE 5

Treatment twice daily in hospital settings will be given as ordered and substantiated by a copy of doctor's order.

RULE 6

BILLING PROCEDURE: (1) Bills must be itemized on department or self-insurer forms, as the case may be, specifying the dates and number of treatments, type of modalities or procedures employed and have submitted the report required in Rule 2.

(2) The bill form must be completed in detail to include the claim number if known, the account number and name of the physical therapist rendering the service. Bills will be accepted when signed by other than the physical therapist rendering the service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges rest with the physical therapist rendering the service.

(3) Each person rendering service must submit a separate bill.

(4) For a bill to be considered for payment, it must be received in the department or by the self-insurer within 90 days from the date each specific treatment was rendered. Whenever possible bills should be submitted monthly.

(5) UNDER NO CIRCUMSTANCES CAN BILLS BE PAID FOR ANY SERVICES WHILE A CLAIM IS CLOSED.

(6) The department or the self-insurer may reject bills for services rendered in violation of the medical aid rules.

(7) This is a maximum fee schedule. All fees listed are the maximum fees allowable and if a fee for any particular service is lower to the general public than listed in the fee schedule, the practitioner shall bill the department or self-insurer at the lower rate. [Order 75-39, § 296-23-710, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-710, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-710, filed 1/30/74; Order 71-6, § 296-23-710, filed 6/1/71; Order 70-12, § 296-23-710, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-710, filed 11/27/68, effective 1/1/69.]

WAC 296-23-715 Modalities.

	Unit Value
P97000 One of the following modalities to one area	12.0
(a) Hot or cold packs	
(b) Traction, mechanical	
(c) Electrical stimulation (unattended)	
(d) Vasopneumatic devices	
(e) Paraffin bath	
(f) Microwave	
(g) Whirlpool	
(h) Diathermy	
(i) Infrared	
(j) Ultra violet	
P97050 Two or more modalities to the same area	13.0

[Order 74-7, § 296-23-715, filed 1/30/74; Order 68-7, § 296-23-715, filed 11/27/68, effective 1/1/69.]

WAC 296-23-720 Procedures. (Therapist is required to be in constant attendance.)

	Unit Value
P97100 One of the following procedures to one area, initial 30 minutes	16.0
(a) Therapeutic exercises	
(b) Neuromuscular re-education	
(c) Functional activities	
(d) Gait training	
(e) Electrical stimulation (manual)	
(f) Traction, manual	
(g) Massage	
(h) Contrast baths	

Unit Value

	(i) Ultrasound	
P97101	Each additional 15 minutes	5.0
P97200	Combination of any modality(s) and procedure(s), initial 30 minutes	16.0
P97201	Each additional 15 minutes	5.0
P97220	Hubbard tank, initial 30 minutes	24.0
P97221	Each additional 15 minutes (maximum allowance, one hour)	5.0
P97240	Pool therapy or hubbard tank with therapeutic exercises, initial 30 minutes	30.0
P97241	Each additional 15 minutes (maximum allowance, one hour)	6.0
P97250	Sterile technique (severe burn cases and open draining areas requiring sterile bandages and dressings)	6.0
[Order 76-34, § 296-23-720, filed 11/24/76, effective 1/1/77; Order 74-7, § 296-23-720, filed 1/30/74.]		

WAC 296-23-725 Tests and measurements.

	Unit Value	
P97700	One of the following tests or measurements with report, initial 30 minutes	24.0
	(a) Orthotic "check-out"	
	(b) Prosthetic "check-out"	
	(c) Activities of daily living "check-out"	
P97701	Each additional 15 minutes	12.0
P97720	Extremity testing for strength, dexterity or stamina, initial 30 minutes	24.0
P97721	Each additional 15 minutes	12.0
P97740	Kinetic activities to increase coordination, strength and/or range of motion, one area (i.e., any two extremities or trunk), initial 30 minutes	24.0
P97741	Each additional 15 minutes	12.0
[Order 74-7, § 296-23-725, filed 1/30/74.]		

DRUGLESS THERAPEUTICS

WAC 296-23-810 General instructions. (1) Fees cover services and reports in all cases that can qualify for worker's compensation benefits. This fee schedule is intended to cover all examinations, reports and treatment.

(2) The maximum fee is determined by multiplying the unit value of a procedure by a conversion factor. Individual conversion factor tables apply to separate sections of the maximum fee schedule when such an item or procedure is used in the care and treatment of an industrial injury.

(3) Communications to the department must show the patient's full name and claim number if known. If the

claim number is unknown, in addition to the patient's name, show the date and the nature of the injury and the employer's name. A communication should refer to one claim only. Correspondence regarding drugless therapeutic services should be sent directly to the department in Olympia or self-insurer in order to avoid rehandling by the service location.

(4) **LIGHT WORK:** The attending drugless practitioner is urged to bear in mind that light work is frequently beneficial for body conditioning and the gaining of self-confidence. Accordingly, where light work is available and whenever an employer requests that a worker be certified by a drugless practitioner as able to perform available work other than his usual work, the employer shall furnish to the physician, with a copy to the worker, a statement describing the available work in terms that will enable the drugless practitioner to relate the physical activities of the job to worker's disability. The drugless practitioner shall then determine whether the worker is physically able to perform the work described.

(5) **REGULAR WORK:** When the attending practitioner determines that the patient is capable of returning to his regular work he should be informed and the department notified as to the specific date. Compensation will be terminated on this date. Further care will be allowed as outlined in WAC 296-23-81005.

(6) **TERMINATION OF THERAPY.** When therapy is no longer required and the industrial condition stabilized, a report must be submitted to the department or self-insurer to this effect stating the specific date. This is necessary for closure of the industrial claim, even though the patient may require continued care for conditions not related to the industrial condition.

(7) **PERMANENT DISABILITY.** When the patient has, in the opinion of the attending practitioner a permanent partial disability or measurable impairment of function, the attending practitioner should notify the department or self-insurer so that an examination can be scheduled to determine the extent of impairment. [Order 76-34, § 296-23-810, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-810, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-810, filed 11/22/74, effective 1/1/75; Order 74-7, § 296-23-810, filed 1/30/74; Order 71-6, § 296-23-810, filed 6/1/71; Order 70-12, § 296-23-810, filed 12/1/70, effective 1/1/71; Order 68-7, § 296-23-810, filed 11/27/68, effective 1/1/69.]

WAC 296-23-81001 Who may treat. All licensed drugless practitioners except those under suspension by the department, are eligible to treat injured workers entitled to benefits under the Industrial Insurance Law. Only that treatment which falls within the scope and field of the drugless practitioner's license will be allowed.

No drugless practitioner shall be formally refused permission to treat cases coming under the jurisdiction of the department or the self-insurer, except for reasons that are, in the opinion of the department or self-insurer to the best interest of the workers and the funds which were created for their protection.

Reasons for holding a drugless practitioner ineligible to treat industrial insurance cases include, but are not necessarily limited to, any one or a combination of the following:

(1) Failure, neglect or refusal to submit complete, adequate and detailed reports.

(2) Failure, neglect or refusal to respond to request by the department or the self-insurer for additional reports.

(3) Failure, neglect or refusal to observe and comply with the department's orders and medical aid rules.

(4) Persistent failure to recognize emotional and social factors impeding recovery of the injured worker.

(5) Submission of false or misleading reports to the department or to the self-insurer.

(6) Collusion with any other persons in submission of false or misleading information to the department or to the self-insurer.

(7) Submission of inaccurate or misleading bills.

(8) Persistent submission of false or erroneous diagnosis.

(9) Knowingly submitting bills to an injured worker for treatment of an industrial condition for which the department or self-insurer has accepted responsibility.

(10) Charging or attempting to charge industrially injured workers any fee for care of conditions for which the department or self-insurer has accepted responsibility.

(11) Conviction in any court of any offense involving a moral turpitude, in which case the record of such conviction shall be conclusive evidence.

(12) The use or prescription for use of narcotic, addictive, habituating or dependency producing drugs.

(13) Repeated acts of gross misconduct in the practice of the profession.

(14) Declaration of mental incompetency by a court of competent jurisdiction. [Order 76-34, § 296-23-81001, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81002 Acceptance of rules and fees. The filing of an accident report or the rendering of treatment to an injured worker who comes under the department's or self-insurer's jurisdiction, as the case may be, constitutes acceptance of the department's medical aid rules and shall comply with its rules and fees.

In accordance with RCW 51.28.020 of the Industrial Insurance Law, when a drugless practitioner renders treatment to an injured worker entitled to benefits under the law, "it shall be the duty of the physician to inform the injured workman of his rights under this title and to lend all necessary assistance in making this application for compensation and such proof of other matters as required by the rules of the department without charge to the workman." An injured worker shall not be billed for treatment rendered for his industrial injury or occupational disease.

When an unrelated condition is being treated concurrently with an industrial injury, the department or self-insurer shall be notified immediately by the treating drugless practitioner of the nature of the unrelated condition and the treatment being rendered and the effect,

if any, on the patient's recovery from the industrial injury.

In cases of questionable beneficiary where the treating drugless practitioner has billed the injured worker, and the claim is subsequently allowed, the drugless practitioner shall refund the injured worker in full and bill the department or self-insurer for services rendered at department rates.

Cases in which there is a question of professional ethics or quality of treatment, will be referred for peer review by the appropriate professional society, committee or organization.

This is a maximum fee schedule. All fees listed are the maximum fees allowable and if a fee for any particular service is lower to the general public than listed in the fee schedule, the practitioner shall bill the department or self-insurer at the lower rate. [Order 76-34, § 296-23-81002, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81003 Penalties. RCW 51.48.060 of the Industrial Insurance Law provides that a civil penalty of \$100.00 may be assessed against any physician who; "—fails, neglects or refuses to file a report with the director, as required by this title, within five days of treatment showing the condition of the injured workman at the time of treatment, a description of the treatment given, and an estimate of the probable duration of the injury, or who fails or refuses to render all necessary assistance to the injured workman, as required by this title,— —."

RCW 51.48.080 of the Industrial Insurance Law provides that, "Every person, firm or corporation who violates or fails to obey, observe or comply with any rule of the department promulgated under authority of this title, shall be subject to a penalty of not to exceed two hundred and fifty dollars". [Order 76-34, § 296-23-81003, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81004 Initial treatment and report of accident. It is the responsibility of each drugless practitioner accepting an industrial injury for treatment, to ascertain whether he is the first attending drugless practitioner. If not, he must refer the worker to the original drugless practitioner, unless the worker desires to be transferred to his care. In this event, approval for the transfer must be obtained in accordance with WAC 296-23-81009.

If the practitioner is the first attending practitioner, he will take the following action:

- (1) Give emergency treatment.
- (2) Immediately complete and forward the report of the accident, to the department or the self-insurer, as the case may be, and the employer. Instruct and give assistance to the injured worker in completing his portion of the report of accident. The following information is necessary so that there is no delay in adjudication of the claim or payment of compensation.
 - (a) Complete history of the industrial accident.
 - (b) Complete listing of positive drugless therapeutic findings.
 - (c) Specific drugless therapeutic diagnosis relating to the injury.

(d) Types of treatment rendered.

(e) Drugless therapeutic conditions which may influence recovery or cause complications.

(f) Estimate time loss due to the injury.

(3) If the patient remains under your care continue with necessary treatment in accordance with medical aid rules. [Order 76-34, § 296-23-81004, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81005 Treatment following initial treatment. (1) Up to ten office calls for treatment of the industrial injury will be allowed without authorization during the first thirty days following initial treatment.

(2)(a) If necessary, x-rays may be taken immediately prior to and immediately following the initial drugless therapeutic treatment without prior authorization.

(b) X-rays immediately prior to and immediately following each subsequent drugless therapeutic treatment will be disallowed, unless previously authorized.

(c) Prior authorization must be obtained for x-rays subsequent to initial treatment.

(d) Payment will not be made for excessive or unnecessary x-rays. No payment will be made for x-rays taken on rejected or closed claims, except those taken in conjunction with a reopening application.

(e) See WAC 296-23-01002 for custody requirements for x-rays.

(3) Prior authorization for drugless therapy in excess of ten treatments must be obtained. Authorization will only be granted when there is sufficient evidence that treatment requested will result in improvement of the industrial condition.

(4) Drugless therapy as a palliative or maintenance measure will not be paid. [Order 77-27, § 296-23-81005, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-81005, filed 12/1/77; Emergency Order 77-16, § 296-23-81005, filed 9/6/77; Order 76-34, § 296-23-81005, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81006 Rejected and closed claims. (1) Except for services requested by the department or the self-insurer or diagnostic procedures forming the basis for action on a claim, no payment for treatment or medication will be made in claims for which responsibility has not been accepted (rejected).

(2) When a claim is closed the only services for which payment will be made are those services requested by the department or the self-insurer and/or the examination, along with necessary diagnostic procedures, in connection with the submission of an application to reopen a claim for aggravation. [Order 76-34, § 296-23-81006, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81007 Treatment beyond 60 days. Conditions requiring treatment beyond sixty days are indicative of a major industrial condition or complication by other pathology. Except in cases of severe and extensive injuries, when the worker is unable to return to work within sixty days, the department or the self-insurer, as the case may be, may request a complete examination to determine and/or establish:

(1) What, if any, other pre-existing or concurrent conditions exist in addition to the industrial injury.

(2) What effect, if any, the unrelated conditions have on the industrial injury.

(3) The full extent, diagnosis, probable duration, anticipated treatment and prognosis of these conditions.

This examination may be conducted by the attending drugless practitioner or another drugless practitioner of his choice provided the conditions fall within the scope and field of drugless therapeutics. If the conditions do not fall within the scope and field of drugless therapeutics, then the examination must be conducted by an appropriate medical or osteopathic specialty. [Order 76-34, § 296-23-81007, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81008 Doctor's supplemental report.

The department or the self-insurer will make periodic requests for the drugless practitioner to submit a supplemental report. When requesting a report the department or the self-insurer will forward a "Doctor's Supplemental Report" form to be completed and returned to the department or self-insurer. It is intended that this report contain sufficient information to allow the department or self-insurer to authorize treatment, pay time loss compensation and medical bills without requiring additional correspondence from the practitioner. When the report is completed in adequate detail for this purpose and returned promptly, the department or self-insurer will pay for its completion.

Billing for the report must be submitted in accordance with the procedures outlined in WAC 296-23-81011. [Order 76-34, § 296-23-81008, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81009 Transfer of practitioners. All transfers from one practitioner to another must be approved by the department or self-insurer. Normally transfers will be allowed only after the worker has been under the care of the attending practitioner for sufficient time for him to establish an appropriate treatment regimen and to evaluate the efficacy of the therapeutic course.

X-rays will be forwarded to the new attending practitioner or attending physician.

The department and the self-insurer reserves the right to require a worker to select another physician or specialist for treatment, under the following conditions:

(1) When more conveniently located practitioners, qualified to provide the necessary treatment, are available.

(2) When the attending practitioner fails to cooperate in observance and compliance with department rules.

(3) In time loss cases where reasonable progress toward return to work is not shown.

(4) Cases requiring specialized treatment, which the attending practitioner is not qualified to render.

(5) Where the department or the self-insurer finds a transfer of practitioners to be appropriate and has requested the worker to transfer, the department or the self-insurer may select a new practitioner if the worker unreasonably refuses or delays in selecting another practitioner.

Transfer will be authorized for the foregoing reasons or where the department or the self-insurer in its discretion finds that a transfer is in the best interest of returning the injured worker to a productive role in society.

(6) In cases where the practitioner is qualified to treat each of several conditions which the attending practitioner is not qualified to treat. [Order 77-27, § 296-23-81009, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-81009, filed 12/1/77; Emergency Order 77-16, § 296-23-81009, filed 9/6/77; Order 76-34, § 296-23-81009, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81010 Concurrent treatment. Treatment by more than one practitioner concurrently will be allowed only when the conditions resulting from the injury involve more than one system requiring specialty care, and when approved by the attending practitioner. When more than one practitioner are providing care, the department shall designate one as the attending practitioner. [Order 76-34, § 296-23-81010, filed 11/24/76, effective 1/1/77.]

WAC 296-23-81011 Billing procedures. (1) Bills must be itemized on the department or self-insurer forms, as the case may be, specifying the date, type of service and charges for each service.

(2) The bill form must be completed in detail and include the claim number. The account number and name of the practitioner rendering service must be included on the bill. Bills will be accepted when signed by other than the practitioner rendering service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges, rests with the practitioner rendering the service.

(3) For a bill to be considered for payment, it must be received in the department or by the self-insurer within ninety days from the end of the month in which the service was rendered.

(4) Bills for x-rays services must be submitted in conformance with the fees for the particular service as specified in the radiological portion of the maximum fee schedule. Diagnostic reports must accompany the bill.

(5) Except for services requested by the department, completion of a reopening examination and application is the only service for which payment may be made while a claim is closed. **UNDER NO CIRCUMSTANCES CAN BILLS BE PAID FOR ANY OTHER SERVICES RENDERED WHILE A CLAIM IS CLOSED.**

(6) The department or the self-insurer may reject bills for services rendered in violation of the medical aid rules. [Order 77-27, § 296-23-81011, filed 11/30/77, effective 1/1/78; Emergency Order 77-26, § 296-23-81011, filed 12/1/77; Emergency Order 77-16, § 296-23-81011, filed 9/6/77; Order 76-34, § 296-23-81011, filed 11/24/76, effective 1/1/77.]

WAC 296-23-811 Office visits. The following services are generally part of the basic services listed in the

maximum fee schedule but do involve additional expenses to the douglass [drugless] therapeutic practitioner for materials, for his time or that of his employees. These services are generally provided as an adjunct to common drugless therapeutic services and should be used only when circumstances clearly warrant an additional charge over and above the usual charges for the basic services.

	Unit Value
D99030 Mileage, one way, each mile beyond 7 mile radius of point of origin (office or home), per mile	2.0
D99052 Services requested between 6:00 P.M. and 8:00 A.M. in addition to basic services, provided the office is closed during this period of time	12.0
D99054 Services requested on Sundays and holidays in addition to basic services	12.0
D99082 Completion of Certificate of Disability Card	2.0

NEW PATIENT

D90000 Routine examination, history, and/or treatment (routine procedure), and submission of a report and/or if immediately following an injury, submission of Report of Accident	25.0
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FOLLOW-UP TREATMENT

D90010 Office visit including evaluation and/or treatment	16.0
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[Order 76-34, § 296-23-811, filed 11/24/76, effective 1/1/77; Order 75-39, § 296-23-811, filed 11/28/75, effective 1/1/76; Order 74-39, § 296-23-815, (codified as WAC 296-23-811), filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-811, filed 1/30/74; Order 68-7, § 296-23-811, filed 11/27/68, effective 1/1/69.]

WAC 296-23-900 Nurse practitioner rules. (1) Registered nurses and licensed practical nurses may perform private duty nursing care in industrial injury cases when the attending physician deems this care necessary.

(2) Registered nurses in remote areas may perform advanced levels of nursing care on a fee for service basis in industrial injury cases within the limitations of Rules 3 & 4 below.

(3) Advance approval must be obtained from the department to treat industrial injury cases. To be eligible to treat industrial injuries, the nurse practitioner must:

(a) Until rules governing certification by the professional license division are adopted, provide the department certification of graduation from an approved program of training for advance levels of nursing care.

(b) Be under the supervision of a physician who is accepting responsibility for treatment rendered by the nurse practitioner.

(c) Provide the department with the supervising physicians certification of the areas in which the nurse is competent to perform.

(d) Provide the department with evidence of a reliable and rapid system of communication with the supervising physician.

(4) The scope of practice for nurse practitioners under the industrial insurance program is limited to:

(a) Preparing reports of accident and progress reports for the supervising physician's signature.

(b) Emergency treatment of serious injuries to include initial wound care, administration of medication and support of life functions.

(c) Treatment of minor injuries to include suturing of minor lacerations not involving tendons, nerves or bones.

(d) Removal of sutures.

(e) Removal of foreign bodies from eyes.

(f) Removal of slivers or foreign bodies where bones, nerves and tendons are not involved.

(g) Administering drugs and medications on standing orders from the supervising physician.

(h) Nursing type follow-up care (i.e., dressing changes, etc.)

(i) Accompanying ambulance to the site of injury and/or to the hospital with the injured workman.

(5) BILLING PROCEDURES

(a) Bills must be itemized on department or self-insurer forms, as the case may be specifying the date, type of service and the charges for each service.

(b) The bill form must be complete in detail to include the claim number if known. The account number and name of the nurse practitioner rendering service must be included on the bill. Bills will be accepted when signed by other than the practitioner rendering service. When bills are prepared by someone else, responsibility for the completeness and accuracy of the description of services and charges, rests with the practitioner rendering the service.

(c) For a bill to be considered for payment, it must be received in the department or by the self-insurer within 90 days from the date each specific treatment and/or service or treatment was rendered or performed. Whenever possible, bills should be submitted monthly.

(d) Bills cannot be paid for services rendered while a claim is closed.

(e) The department or the self-insurer may reject bills for services rendered in violation of the medical aid rules. [Order 74-39, § 296-23-900, filed 11/22/74, effective 4/1/75; Order 74-7, § 296-23-900, filed 1/30/74.]

WAC 296-23-910 Maximum values are established for services rendered by nurse practitioners. The following maximum values are established for services rendered by nurse practitioners.

	Unit Value
(1) Initial office visit, to include history, initiation of treatment and preparation of Report of Accident for supervising physician's signature	14.0
(2) Follow-up office visit	7.0
(3) Suture of minor lacerations	20.5
(4) Removal of foreign bodies from the eye	14.0
(5) Office visit, Sunday, Holidays or at night. To be paid in addition to fees listed above	7.0
(6) Accompanying an ambulance to the site of the injury and/or the hospital. (First half hour or fraction thereof.)	14.0
(7) Each additional fifteen minutes or fraction thereof	7.0
(8) All other services paid as follow-up visits.	
(9) Home visits not authorized.	

[Order 74-7, § 296-23-910, filed 1/30/74.]

Chapter 296-24 WAC

GENERAL SAFETY AND HEALTH STANDARDS

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 on the title digest page; for a full listing of sections within subchapters refer to the appropriate subchapter digest preceding the text of such sections.

Subchapters

- Part A-1 General, educational, medical and first aid requirements. (WAC 296-24-001 through 296-24-073)
- Part A-2 Personal protective equipment. (WAC 296-24-075 through 296-24-094)
- Part B-1 Sanitation, temporary labor camps and nonwater carriage disposal systems. (WAC 296-24-120 through 296-24-13013)
- Part B-2 Safety color code for marking physical hazards, etc., window washing. (WAC 296-24-135 through 296-24-14519)
- Part C Machinery and machine guarding. (WAC 296-24-150 through 296-24-20533)
- Part D Materials handling and storage, including cranes, derricks, etc., and rigging. (WAC 296-24-215 through 296-24-29431)
- Part E Hazardous materials, flammable and combustible liquids, spray finishing, dip tanks. (WAC 296-24-295 through 296-24-450)
- Part F-1 Storage and handling of liquefied petroleum gases. (WAC 296-24-475 through 296-24-47517)
- Part F-2 Storage and handling of anhydrous ammonia. (WAC 296-24-510 through 296-24-51099)
- Part G Means of egress, fire protection and fire suppression equipment. (WAC 296-24-550 through 296-24-625)
- Part H-1 Hand and portable powered tools and other hand-held equipment. (WAC 296-24-650 through 296-24-67005)
- Part H-2 Safe practices of abrasive blasting operations, ventilation. (WAC 296-24-675 through 296-24-67701)
- Part I Welding, cutting and brazing. (WAC 296-24-680 through 296-24-722)

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- Part J-1 Working surfaces, guarding floors and wall openings, ladders, scaffolds. (WAC 296-24-735 through 296-24-85505)
- Part J-2 Powered platforms, etc. (WAC 296-24-870 through 296-24-90009)
- Part K Compressed gas and compressed gas equipment. (WAC 296-24-920 through 296-24-94003)
- Part L Electrical. (WAC 296-24-950 through 296-24-955)

Part A-1

GENERAL, EDUCATIONAL, MEDICAL AND FIRST AID REQUIREMENTS

WAC

- 296-24-001 Foreword.
- 296-24-003 Subsections, subdivisions, items, subitems, and segments.
- 296-24-005 Purpose and scope.
- 296-24-006 Equipment approval by non-state agency or organization.
- 296-24-007 Incorporation of standards of national organization.
- 296-24-008 Incorporation of standards of federal agency.
- 296-24-010 Variance and procedure.
- 296-24-012 Definitions applicable to all sections of this chapter.
- 296-24-015 Education and first-aid standards.
- 296-24-020 Management's responsibility.
- 296-24-025 Employee's responsibility.
- 296-24-040 Accident prevention program.
- 296-24-055 Safety bulletin board.
- 296-24-060 First-aid training and certification.
- 296-24-065 First-aid kit.
- 296-24-067 First-aid station.
- 296-24-070 First-aid room.
- 296-24-073 Safe place standards.

WAC 296-24-001 Foreword. This chapter has been compiled with the purpose of consolidating all safety rules of general application into one chapter of the Washington Administrative Code, by the promulgation of the rules contained herein. It is also the intent that the safety rules 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 Safety is incorporating many of the existing safety rules of general application and adding new rules under this chapter. [Order 73-5, § 296-24-001, filed 5/9/73 and Order 73-4, § 296-24-001, filed 5/7/73.]

WAC 296-24-003 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. 296-24-330 and 296-24-33002). 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 (aa), (bb), (cc), 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	(aa) (bb)

[Order 76-6, § 296-24-003, filed 3/1/76; Order 73-5, § 296-24-003, filed 5/9/73 and Order 73-4, § 296-24-003, filed 5/7/73.]

WAC 296-24-005 Purpose and scope. The rules included in this chapter apply throughout the State of Washington, to any and all work places under the jurisdiction of the Department of Labor and Industries. These rules are minimum safety requirements with which all industries must comply. Special industry rules which will complement or augment rules contained in this chapter, appear as vertical standards in other chapters of Title 296 WAC. By adherence to such rules industrial accidents may be eliminated or minimized. [Order 73-5, § 296-24-005, filed 5/9/73 and Order 73-4, § 296-24-005, filed 5/7/73.]

WAC 296-24-006 Equipment approval by non-state 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 provision of this chapter. [Order 73-5, § 296-24-006, filed 5/9/73 and Order 73-4, § 296-24-006, filed 5/7/73.]

WAC 296-24-007 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 73-5, § 296-24-007, filed 5/9/73 and Order 73-4, § 296-24-007, filed 5/7/73.]

WAC 296-24-008 Incorporation of standards of federal agency. (1) Whenever a provision of this chapter incorporates therein provisions of the Code of Federal Regulations (CFR) 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 73-5, § 296-24-008, filed 5/9/73 and Order 73-4, § 296-24-008, filed 5/7/73.]

WAC 296-24-010 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 RCW 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 Supervisor of Safety, 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 74-27, § 296-24-010, filed 5/7/74; Order 73-5, § 296-24-010, filed 5/9/73 and Order 73-4, § 296-24-010, filed 5/7/73.]

WAC 296-24-012 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 his 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) "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.

(9) "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.

(10) "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.

(11) "Shall" means mandatory.

(12) "Should" means recommended.

(13) "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.

(14) "Suitable" means that which fits, or has the qualities or qualifications to meet a given purpose, occasion, condition, function, or circumstance.

(15) "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.

(16) "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.

(17) "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.

(18) 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 for Mechanical Engineers.

(g) "ASTM" means American Society for 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'Eclairage.

(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.

(u) "MCA" means Manufacturing Chemist Association.

(v) "NBFU" means National Board of Fire Underwriters.

(w) "NEMA" means National Electrical Manufacturing Association.

(x) "NFPA" means National Fire Protection Association.

(y) "NTP" means Normal Temperature and Pressure.

(z) "OD" means Outside Diameter.

(aa) "PSI" means Pounds per Square Inch.

(bb) "PSIA" means Pounds per Square Inch Atmospheric.

(cc) "PSIG" means Pounds per Square Inch Gauge.

(dd) "RMA" means Rubber Manufacturers Association.

(ee) "SAE" means Society of Automotive Engineers.

(ff) "TFI" means The Fertilizer Institute.

(gg) "TSC" means Trailer Standard Code.

(hh) "UL" means Underwriters' Laboratories, Inc.

(ii) "USASI" means United States of America Standards Institute.

(jj) "USC" means United States Code.

(kk) "USCG" means United States Coast Guard.

(ll) "WAC" means Washington Administrative Code.

(mm) "WISHA" means Washington Industrial Safety and Health Act of 1973. [Order 73-5, § 296-24-012, filed 5/9/73 and Order 73-4, § 296-24-012, filed 5/7/73.]

WAC 296-24-015 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 Safety or by statute. (RCW 49.16.030). [Order 73-5, § 296-24-015, filed 5/9/73 and Order 73-4, § 296-24-015, filed 5/7/73.]

WAC 296-24-020 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.

(d) Reporting of Fatality or Multiple Hospitalization Accidents. Within twenty-four hours after the occurrence of an employment accident which results in an immediate or probable fatality to one or more employees, or which results in 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.

(e) Equipment involved in an accident resulting in an immediate 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.

(f) 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 eye witnesses to the accident, or whoever the investigator deems necessary to complete his investigation. [Order 74-27, § 296-24-020, filed 5/7/74; Order 73-5, § 296-24-020, filed 5/9/73 and Order 73-4, § 296-24-020, filed 5/7/73.]

WAC 296-24-025 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. [Order 74-27, § 296-24-025, filed 5/7/74; Order 73-5, § 296-24-025, filed 5/9/73 and Order 73-4, § 296-24-025, filed 5/7/73.]

WAC 296-24-040 Accident prevention program. (1) An accident prevention program, wherein there is equitable management-employee participation, shall be established in all establishments, industrial plants, or operations.

(2) It shall be the responsibility of the employer to initiate and maintain such accident prevention programs as may be necessary to comply with this part. The Division may be contacted for assistance in initiating and maintaining an effective accident prevention program.

(3) All accident prevention programs shall be tailored to the needs of the particular plant or operation.

(4) Employer and employee representatives, as elected, delegated or appointed, shall attend and actively take part in frequent and regular safety committee meetings.

(5) Accident prevention programs shall provide for employer-employee safety meetings and frequent and regular safety inspections of job sites, materials, equipment, and operating procedures.

(6) Frequency of safety meetings and safety inspections shall be determined by the employer.

(7) Safety inspections shall be administered by competent personnel as designated by the employer.

(8) A record of safety activities, such as inspections, meetings and training shall be maintained by the employer for a period covering the previous twelve months and shall be made available, upon request, to noncompliance personnel of the Department of Labor and Industries. [Order 74-27, § 296-24-040, filed 5/7/74; Order 73-5, § 296-24-040, filed 5/9/73 and Order 73-4, § 296-24-040, filed 5/7/73.]

WAC 296-24-055 Safety bulletin board. There shall be installed and maintained in every fixed establishment employing eight or more persons, 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. [Order 73-5, § 296-24-055, filed 5/9/73 and Order 73-4, § 296-24-055, filed 5/7/73.]

WAC 296-24-060 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) From the Revised Code of Washington (RCW 51.36.030) "Every employer . . . shall cooperate with the department in training one or more employees in first aid to the injured."

(2) There shall be present or available at all work sites, at all times, a person or persons holding a valid certificate of first aid training from the Department of Labor and Industries, U.S. Bureau of Mines, the American Red Cross, or equivalent training that can be verified by documentary evidence. (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 purposes 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.)

(b) In fixed establishments, all foremen, supervisors, or persons in direct charge of 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 group.

NOTE: In emergencies, foremen will be permitted to work up to 30 days without having the required certificate, providing an employee in the crew or another foreman in the immediate 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 the valid first-aid certificate shall be available at all times employees are working within that department.

(d) In small businesses, offices or similar types of fixed workplaces, compliance with the requirements of subsection (2) of this section 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 Safety Education Section of the Division of Industrial Safety and Health for approval. That section is also available for assisting employers who wish to develop such a plan. Criteria for approval by the Division include:

(i) The businesses within the group must not be widely dispersed;

(ii) The person or persons holding the first-aid certificates, 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 must be available as required by WAC 296-24-065.

(7) Those employers who believe that establishments for which they are responsible are proximate enough to a fixed location of professional medical services, such as a hospital, clinic etc. and wish to be exempted from the requirements of this section, may apply to the department for a variance from these provisions according to RCW 49.17.080, 49.17.090, and WAC 296-24-010.

(8) Industrial first-aid course instructors will, upon request, be furnished by the Division of Industrial Safety and Health, Department of Labor and Industries.

(9) A basic first-aid course recognized by the Division of Industrial Safety and Health, Department of Labor and Industries requires instruction involving student participation in exercises involving the following:

Bleeding control and bandaging.

Practical methods of artificial respiration, including mouth to mouth and mouth to nose resuscitation.

Closed Chest Heart Massage.

Poisons.

Shock, unconsciousness, stroke.

Burns, scalds.

Sunstroke, heat exhaustion.

Frostbite, freezing.

Strains, sprains, hernias.

Fractures, dislocations.

Proper transportation of injured.

Bites, stings.

Subjects covering specific health hazards likely to be encountered by co-workers of first-aid students enrolled in the course.

[Order 74-27, § 296-24-060, filed 5/7/74; Order 73-5, § 296-24-060, filed 5/9/73 and Order 73-4, § 296-24-060, filed 5/7/73.]

WAC 296-24-065 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 Safety, 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 workmen 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
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 (10), sixteen (16), twenty-four (24) or thirty-six (36) 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 1/2 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.

[Order 74-27, § 296-24-065, filed 5/7/74; Order 73-5, § 296-24-065, filed 5/9/73 and Order 73-4, § 296-24-065, filed 5/7/73.]

WAC 296-24-067 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. [Order 73-5, § 296-24-067, filed 5/9/73 and Order 73-4, § 296-24-067, filed 5/7/73.]

WAC 296-24-070 First-aid room. (1) Every fixed establishment employing more than 200 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. [Order 73-5, § 296-24-070, filed 5/9/73 and Order 73-4, § 296-24-070, filed 5/7/73.]

WAC 296-24-073 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. [Order 74-27, § 296-24-073, filed 5/7/74; Order 73-5, § 296-24-073, filed 5/9/73 and Order 73-4, § 296-24-073, filed 5/7/73.]

Part A-2

PERSONAL PROTECTIVE EQUIPMENT

WAC

296-24-075	Personal protective equipment.
296-24-07501	General requirements.
296-24-078	Eye and face protection.
296-24-07801	General.
296-24-081	Respiratory protection.
296-24-08101	Permissible practice.
296-24-08103	Requirements for a minimal acceptable program.
296-24-08105	Selection of respirators.
296-24-08107	Air quality.
296-24-08109	Use of respirators.
296-24-08111	Maintenance and care of respirators.
296-24-08113	Identification of gas mask canisters.
296-24-084	Occupational head protection.
296-24-086	Personal flotation devices.
296-24-088	Occupational foot protection.
296-24-092	Electrical protective devices.
296-24-094	Lighting and illumination.

WAC 296-24-075 Personal protective equipment. [Order 73-5, § 296-24-075, filed 5/9/73 and Order 73-4, § 296-24-075, filed 5/7/73.]

WAC 296-24-07501 General requirements. (1) Application. (a) Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, 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. [Order 73-5, § 296-24-07501, filed 5/9/73 and Order 73-4, § 296-24-07501, filed 5/7/73.]

WAC 296-24-078 Eye and face protection. [Order 73-5, § 296-24-078, filed 5/9/73 and Order 73-4, § 296-24-078, filed 5/7/73.]

WAC 296-24-07801 General. (1) Protective eye and face equipment shall be required where there is a reasonable probability of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors. No unprotected person shall knowingly be

subjected to a hazardous environmental condition. Suitable eye protectors shall be provided where machines or operations present the hazard of flying objects, glare, liquids, injurious radiation, or a combination of these hazards.

(2) Protectors shall:

(a) Provide adequate protection against the particular hazards for which they are designed.

(b) Be reasonably comfortable when worn under the designated conditions.

(c) Fit snugly and shall not unduly interfere with the movements of the wearer.

(d) Be durable.

(e) Be capable of being disinfected.

(f) Be easily cleanable.

(3) Protectors should be kept clean and in good repair.

(4) Persons whose vision requires the use of corrective lenses in spectacles, and who are required by this standard to wear eye protection, shall wear goggles or spectacles of one of the following types:

(a) Spectacles whose protective lenses provide optical correction.

(b) Goggles that can be worn over corrective spectacles without disturbing the adjustment of the spectacles.

(c) Goggles that incorporate corrective lenses mounted behind the protective lenses.

(5) Every protector shall be distinctly marked to facilitate identification of the manufacturer.

(6) When limitations or precautions are indicated by the manufacturer, they shall be transmitted to the user and care taken to see that such limitations and precautions are strictly observed.

(7) Design, construction, testing, and use of devices for eye and face protection shall be in accordance with American National Standard for Occupational and Educational Eye and Face Protection, Z87.1-1968. [Order 73-5, § 296-24-07801, filed 5/9/73 and Order 73-4, § 296-24-07801, filed 5/7/73.]

WAC 296-24-081 Respiratory protection. [Order 73-5, § 296-24-081, filed 5/9/73 and Order 73-4, § 296-24-081, filed 5/7/73.]

WAC 296-24-08101 Permissible practice. (1) In the control of those occupational diseases caused by breathing air contaminated with harmful dusts, fogs, fumes, mists, gases, smokes, sprays, or vapors, the primary objective shall be to prevent atmospheric contamination. This shall be accomplished as far as feasible by accepted engineering control measures (for example, enclosure or confinement of the operation, general and local ventilation, and substitution of less toxic materials). When effective engineering controls are not feasible, or while they are being instituted, appropriate respirators shall be used pursuant to the following requirements.

(2) Respirators shall be provided by the employer when such equipment is necessary to protect the health of the employee. The employer shall provide the respirators which are applicable and suitable for the purpose intended. The employer shall be responsible for the establishment and maintenance of a respiratory protective

program which shall include the requirements outlined in WAC 296-24-08103.

(3) The employee shall use the provided respiratory protection in accordance with instructions and training received. [Order 73-5, § 296-24-08101, filed 5/9/73 and Order 73-4, § 296-24-08101, filed 5/7/73.]

WAC 296-24-08103 Requirements for a minimal acceptable program. (1) Written standard operating procedures governing the selection and use of respirators shall be established.

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(3) The user shall be instructed and trained in the proper use of respirators and their limitations.

(4) Where practicable, the respirators should be assigned to individual workers for their exclusive use.

(5) Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker should be cleaned after each day's use, or more often if necessary. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use.

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

(7) Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(9) There shall be regular inspection and evaluation to determine the continued effectiveness of the program.

(10) Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician should determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).

(11) Approved or accepted respirators shall be used. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities.

NOTE: The U.S. Department of Interior, Bureau of Mines, and the U.S. Department of Agriculture are recognized as such authorities. Although respirators listed by the U.S. Department of Agriculture continue to be acceptable for protection against specified pesticides, the U.S. Department of the Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators.

[Order 73-5, § 296-24-08103, filed 5/9/73 and Order 73-4, § 296-24-08103, filed 5/7/73.]

WAC 296-24-08105 Selection of respirators. Proper selection of respirators shall be made according to the

guidance of American National Standard Practices for Respiratory Protection Z88.2-1969. [Order 73-5, § 296-24-08105, filed 5/9/73 and Order 73-4, § 296-24-08105, filed 5/7/73.]

WAC 296-24-08107 Air quality. (1) Compressed air, compressed oxygen, liquid air, and liquid oxygen used for respiration shall be of high purity. Oxygen shall meet the requirements of the United States Pharmacopoeia for medical or breathing oxygen. Breathing air shall meet at least the requirements of the specification for Grade D breathing air as described in Compressed Gas Association Commodity Specification G-7.1-1966. Compressed oxygen shall not be used in supplied-air respirators or in open circuit self-contained breathing apparatus that have previously used compressed air. Oxygen shall not be used with air line respirators.

(2) Breathing air may be supplied to respirators from cylinders or air compressors.

(a) Cylinders shall be tested and maintained as prescribed in the Shipping Container Specification Regulations of the Department of Transportation (49 CFR Part 178) dated October 1, 1972.

(b) The compressor for supplying air shall be equipped with necessary safety and standby devices, described in this item. A breathing air-type compressor shall be used. Compressors shall be constructed and situated so as to avoid entry of contaminated air into the system and suitable in-line air purifying sorbent beds and filters installed to further assure breathing air quality. A receiver of sufficient capacity to enable the respirator wearer to escape from a contaminated atmosphere in event of compressor failure, and alarms to indicate compressor failure and overheating shall be installed in the system. If an oil-lubricated compressor is used, it shall have a high-temperature or carbon monoxide alarm, or both. If only a high-temperature alarm is used, the air from the compressor shall be frequently tested for carbon monoxide to insure that it meets the specifications in (1) of this section.

(3) Air line couplings shall be incompatible with outlets for other gas systems to prevent inadvertent servicing of air line respirators with nonrespirable gases or oxygen.

(4) Breathing gas containers shall be marked in accordance with American National Standard Method of Marking Portable Compressed Gas Containers to Identify the Material Contained, Z48.1-1954; Federal Specification BB-A-1034a, June 21, 1968, Air, Compressed for Breathing Purposes; or Interim Federal Specification GG-B-00675b, April 27, 1965, Breathing Apparatus, Self-Contained. [Order 73-5, § 296-24-08107, filed 5/9/73 and Order 73-4, § 296-24-08107, filed 5/7/73.]

WAC 296-24-08109 Use of respirators. (1) Standard procedures shall be developed for respirator use. These shall include all information and guidance necessary for their proper selection, use, and care. Possible emergency and routine uses of respirators shall be anticipated and planned for.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued. Each respirator permanently assigned to an individual should be durably marked to indicate to whom it was assigned. This mark shall not affect the respirator performance in any way. The date of issuance should be recorded.

(3) Written procedures shall be prepared covering safe use of respirators in dangerous atmospheres that might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.

(a) In areas where the wearer, with failure of the respirator, could be overcome by a toxic or oxygen-deficient atmosphere, at least one additional man shall be present. Communications (visual, voice, or signal line) shall be maintained between both or all individuals present. Planning shall be such that one individual will be unaffected by any likely incident and have the proper rescue equipment to be able to assist the other(s) in case of emergency.

(b) When self-contained breathing apparatus or hose masks with blowers are used in atmospheres immediately dangerous to life or health, standby men must be present at the nearest fresh air base with suitable rescue equipment.

(c) Persons using air line respirators in atmospheres immediately hazardous to life or health shall be equipped with safety harnesses and safety lines for lifting or removing persons from hazardous atmospheres or other and equivalent provisions for the rescue of persons from hazardous atmospheres shall be used. A standby man or men with suitable self-contained breathing apparatus shall be at the nearest fresh air base for emergency rescue.

(4) Respiratory protection is no better than the respirator is used, even though it is worn conscientiously. Random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

(5) For safe use of respirator, it is essential that both supervisors and workers be properly instructed in its selection, use, and maintenance and shall be instructed by persons trained to so instruct. Training shall provide the men an opportunity to handle the respirator, have it fitted properly, test its face-piece-to-face seal, wear it in normal air for a long familiarity period, and, finally, to wear it in a test atmosphere.

(a) The employer shall provide fitting instructions including demonstrations and practice in how the respirator should be worn, how to adjust it, and how to determine if it fits properly. Respirators shall not be worn when conditions prevent a good face seal. Such conditions may be a growth of beard, sideburns, a skull cap that projects under the facepiece, or temple pieces on glasses. Also, the absence of one or both dentures can seriously affect the fit of a facepiece. The worker's diligence in observing these factors shall be evaluated by periodic check. To assure the proper protection, the

facepiece shall be checked by the wearer each time he puts on the respirator. This may be done by following the manufacturer's facepiece fitting instructions.

(b) Providing respiratory protection for individuals wearing corrective glasses is a serious problem. A proper seal cannot be established if the temple bars of eye glasses extend through the sealing edge of the full facepiece. As a temporary measure, glasses with short temple bars or without temple bars may be taped to the wearer's head. Wearing of contact lenses in contaminated atmospheres with a respirator shall not be allowed. Systems have been developed for mounting corrective lenses inside full facepieces. When a workman must wear corrective lenses as part of the facepiece, the facepiece and lenses shall be fitted by qualified individuals to provide good vision, comfort, and a gas-tight seal.

(c) If corrective spectacles or goggles are required, they shall be worn so as not to affect the fit of the facepiece. Proper selection of equipment will minimize or avoid this problem. [Order 73-5, § 296-24-08109, filed 5/9/73 and Order 73-4, § 296-24-08109, filed 5/7/73.]

WAC 296-24-08111 Maintenance and care of respirators. (1) A program for maintenance and care of respirators shall be adjusted to the type of plant, working conditions, and hazards involved, and shall include the following basic services:

- (a) Inspection for defects (including a leak check),
- (b) Cleaning and disinfecting,
- (c) Repair, and
- (d) Storage.

(2) Equipment shall be properly maintained to retain its original effectiveness.

(a) All respirators shall be inspected routinely before and after each use. A respirator that is not routinely used but is kept ready for emergency use shall be inspected after each use and at least monthly to assure that it is in satisfactory working condition.

(b) Self-contained breathing apparatus shall be inspected monthly. Air and oxygen cylinders shall be fully charged according to the manufacturer's instructions. It shall be determined that the regulator and warning devices function properly.

(c) Respirator inspection shall include a check of the tightness of connections and the condition of the facepiece, headbands, valves, connecting tube, and canisters. Rubber or elastomer parts shall be inspected for pliability and signs of deterioration. Stretching and manipulating rubber or elastomer parts with a massaging action will keep them pliable and flexible and prevent them from taking a set during storage.

(d) A record shall be kept of inspection dates and findings for respirators maintained for emergency use.

(3) Routinely used respirators shall be collected, cleaned, and disinfected as frequently as necessary to insure that proper protection is provided for the wearer. Each worker should be briefed on the cleaning procedure and be assured that he will always receive a clean and disinfected respirator. Respirators maintained for emergency use shall be cleaned and disinfected after each use.

(4) Replacement or repairs shall be done only by experienced persons with parts designed for the respirator. No attempt shall be made to replace components or to make adjustment or repairs beyond the manufacturer's recommendations. Reducing or admission valves or regulators shall be returned to the manufacturer or to a trained technician for adjustment or repair.

(5) After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals.

(a) Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.

(b) Respirators should be packed or stored so that the facepiece and exhalation valve will rest in a normal position and function will not be impaired by the elastomer setting in an abnormal position.

NOTE: Instructions for proper storage of emergency respirators, such as gas masks and self-contained breathing apparatus, are found in "use and care" instructions usually mounted inside the carrying case lid.

[Order 73-5, § 296-24-08111, filed 5/9/73 and Order 73-4, § 296-24-08111, filed 5/7/73.]

WAC 296-24-08113 Identification of gas mask canisters. (1) The primary means of identifying a gas mask canister shall be by means of properly worded labels. The secondary means of identifying a gas mask canister shall be by a color code.

(2) Employers or their representative who issue or use gas masks falling within the scope of this section shall see that all gas mask canisters purchased or used by them are properly labeled and colored in accordance with these requirements before they are placed in service and that the labels and colors are properly maintained at all times thereafter until the canisters have completely served their purpose.

(3) On each canister shall appear in bold letters the following:

(a)—Canister for

 (Name for atmospheric contaminant)
 or
 Type N Gas Mask Canister

(b) In addition, essentially the following wording shall appear beneath the appropriate phrase on the canister label: "For respiratory protection in atmospheres containing not more than ----- percent by volume of -----"

 (Name of atmospheric contaminant)

(c) All of the markings specified above should be placed on the most conspicuous surface or surfaces of the canister.

(4) Canisters having a special high-efficiency filter for protection against radionuclides and other highly toxic particulates shall be labeled with a statement of the type and degree of protection afforded by the filter. The label shall be affixed to the neck end of, or to the gray stripe which is around and near the top of, the canister. The degree of protection shall be marked as the percent of penetration of the canister by a 0.3-micron-diameter dioctyl phthalate (DOP) smoke at a flow rate of 85 liters per minute.

(5) Each canister shall have a label warning that gas masks should be used only in atmospheres containing sufficient oxygen to support life (at least 16 percent by volume), since gas mask canisters are only designed to neutralize or remove contaminants from the air.

(6) Each gas mask canister shall be painted a distinctive color or combination of colors indicated in Table I-1. All colors used shall be such that they are clearly identifiable by the user and clearly distinguishable from one another. The color coating used shall offer a high degree of resistance to chipping, scaling, peeling, blistering, fading, and the effects of the ordinary atmospheres to which they may be exposed under normal conditions of storage and use. Appropriately colored pressure sensitive tape may be used for the stripes.

TABLE I-1

Atmospheric contaminants to be protected against	Colors assigned*
Acid gases	White.
Hydrocyanic acid gas . .	White with 1/2-inch green stripe completely around the canister near the bottom.
Chlorine gas	White with 1/2-inch yellow stripe completely around the canister near the bottom.
Organic vapors	Black.
Ammonia gas	Green.
Acid gases and ammonia gas	Green with 1/2-inch white stripe completely around the canister near the bottom.
Carbon monoxide	Blue.
Acid gases and organic vapors	Yellow.
Hydrocyanic acid gas and chloropicrin vapor	Yellow with 1/2-inch blue stripe completely around the canister near the bottom.
Acid gases, organic vapors, and ammonia gases	Brown.

**Atmospheric
contaminants to be
protected against**

Colors assigned*

Radioactive materials, excepting tritium and noble gases.....	Purple (Magenta).
Particulates (dusts, fumes, mists, fogs, or smokes) in combination with any of the above cases or vapors	Canister color for contaminant, as designated above, with 1/2-inch gray stripe completely around the canister near the top.
All of the above atmospheric contaminants	Red with 1/2-inch gray stripe completely around the canister near the top.

*Gray shall not be assigned as the main color for a canister designed to remove acids or vapors.

NOTE: Orange shall be used as a complete body, or stripe color to represent gases not included in this table. The user will need to refer to the canister label to determine the degree of protection the canister will afford.

[Order 73-5, § 296-24-08113, filed 5/9/73 and Order 73-4, § 296-24-08113, filed 5/7/73.]

WAC 296-24-084 Occupational head protection.

(1) Helmets for the protection of employees against impact and 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.

(2) Helmets for the head protection of employees exposed to high voltage electrical shock and burns shall meet the specifications contained in American National Standards Institute, Z89.2-1970.

(3) Persons working in the shops around machinery or in locations which present a hair catching or fire hazard shall wear caps or other type of head covering which completely covers the hair. Caps with metal buttons or metal visors shall not be worn around electrical hazards.

(4) Hard hats shall be worn by employees who work around or under scaffolds or other overhead structures, or who are otherwise exposed to the hazards of falling materials and propelled objects. [Order 74-27, § 296-24-084, filed 5/7/74; Order 73-5, § 296-24-084, filed 5/9/73 and Order 73-4, § 296-24-084, filed 5/7/73.]

WAC 296-24-086 Personal flotation devices.

(1) 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 when;

(i) The water depth is known to be less than chest deep on the exposed individual;

(ii) When working behind standard height and strength guardrails;

(iii) When working inside operating cabs or stations which eliminate the possibility of accidentally falling into the water;

(iv) When wearing approved safety belts with lifeline attached so as to preclude the possibility of falling into the water.

(b) Prior to and after each use, personal flotation 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 subdivision (1), 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 Life-saving 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.

(2) Life Ring. (a) Along docks, walkways or other fixed installations on or adjacent to open water more than five (5) feet deep, approved life rings with line attached shall be provided. The life rings shall be spaced at intervals not to exceed 200 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 line attached shall be provided in the immediate vicinity of the work assigned.

(c) Work assigned over water where the vertical drop from an accidental fall would exceed 50 feet, shall be subject to specific procedures as approved by the Department.

(d) Lines attached to life rings shall be at least 90 feet in length, at least 1/4 inch in diameter and have a minimum breaking strength of 500 pounds.

(e) Life rings must be United States Coast Guard approved 30 inch size.

(f) Life rings and attached lines must be maintained to retain at least 75 percent of their designed buoyance and strength. [Order 76-6, § 296-24-086, filed 3/1/76.]

WAC 296-24-088 Occupational foot protection.

(1) Calks or other suitable footwear which will afford reasonable protection from slipping shall be worn while working on logs.

(a) Safety-toe footwear for employees shall meet the requirements and specifications in American National Standard for Men's Safety-Toe Footwear, Z41.1-1967.

(2) Workmen who work in areas where there is a possibility of foot injury due to falling or rolling objects shall wear safety type footwear. [Order 73-5, § 296-24-088, filed 5/9/73 and Order 73-4, § 296-24-088, filed 5/7/73.]

WAC 296-24-092 Electrical protective devices.

(1) Rubber protective equipment for electrical workers shall conform to the requirements established in the American National Standards Institute Standards as specified in the following list:

Item	Standard	DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER
Rubber insulating gloves.	J6.6-1971.	296-24-12013 Lunchrooms. [Order 73-5, § 296-24-12013, filed 5/9/73 and Order 73-4, § 296-24-12013, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
Rubber matting for use around electric apparatus.	J6.7-1935 (R1971).	296-24-12015 Food handling. [Order 73-5, § 296-24-12015, filed 5/9/73 and Order 73-4, § 296-24-12015, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
Rubber insulating blankets.	J6.4-1971.	
Rubber insulating hoods.	J6.2-1950 (R1971).	
Rubber insulating line hose	J6.1-1950 (R1971).	
Rubber insulating sleeves.	J6.5-1971.	

(2) Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operations, suitable insulating floors, mats or platforms shall be provided on which the operator must stand while handling the switches. [Order 73-5, § 296-24-092, filed 5/9/73 and Order 73-4, § 296-24-092, filed 5/7/73.]

WAC 296-24-094 Lighting and illumination. Refer to WAC 296-62-09003 (General Occupational Health Standards) which shall apply as minimum standards of illumination for industrial interiors. [Order 74-27, § 296-24-094, filed 5/7/74.]

Part B-1

SANITATION, TEMPORARY LABOR CAMPS AND NONWATER CARRIAGE DISPOSAL SYSTEMS

WAC	
296-24-120	Sanitation.
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296-24-12002	Definitions.
296-24-12003	General requirements.
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296-24-12007	Toilet facilities.
296-24-12009	Washing facilities.
296-24-12011	Change rooms.
296-24-12017	Consumption of food and beverages on the premises.
296-24-12019	Waste disposal.
296-24-12021	Vermin control.
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296-24-12501	Site.
296-24-12503	Shelter.
296-24-12505	Water supply.
296-24-12507	Toilet facilities.
296-24-12509	Sewage disposal facilities.
296-24-12511	Laundry, handwashing, and bathing facilities.
296-24-12513	Lighting.
296-24-12515	Refuse disposal.
296-24-12517	Construction and operation of kitchens, dining hall, and feeding facilities.
296-24-12519	Insect and rodent control.
296-24-12521	First aid.
296-24-12523	Reporting communicable disease.
296-24-130	Nonwater carriage disposal systems.
296-24-13001	Acceptable industrial disposal systems.
296-24-13003	Privy specifications.
296-24-13005	Chemical toilet specifications.
296-24-13007	Seepage pit construction.
296-24-13009	Combustion toilet.
296-24-13011	Recirculating toilet specifications.
296-24-13013	Portable toilet construction.

WAC 296-24-120 Sanitation. NOTE: Rules and regulations of the State Board of Health Governing Sanitation of Places of Work shall be complied with by every employer, and shall be enforced as provided for by statute law (RCW 43.20.050). [Order 73-5, § 296-24-120, filed 5/9/73 and Order 73-4, § 296-24-120, filed 5/7/73.]

WAC 296-24-12001 Scope. This scope includes all sections of 296-24-120 in the numbering and applies to all permanent places of employment except where domestic, mining, or agricultural work only is performed. Measures for the control of toxic materials are considered to be outside the scope of this section. [Order 74-27, § 296-24-12001, filed 5/7/74; Order 73-5, § 296-24-12001, filed 5/9/73 and Order 73-4, § 296-24-12001, filed 5/7/73.]

WAC 296-24-12002 Definitions. The following definitions are applicable to all sections of this chapter which include WAC 296-24-120 in the section number.

(1) "Lavatory" means a basin or similar vessel used exclusively for washing of the hands, arms, face and head.

(2) "Nonwater carriage toilet facility," means a toilet facility not connected to a sewer.

(3) "Number of employees" means, unless otherwise specified, the maximum number of employees present at any one time on a regular shift.

(4) "Personal service room," means a room used for activities not directly connected with the production or service function performed by the establishment. Such activities include but are not limited to, first-aid, medical services, dressing, showering, toilet use, washing, and eating.

(5) "Potable water" means water which meets the quality standards prescribed in the U.S. Public Health Service Drinking Water Standards, published in 42 CFR part 72, or water which is approved for drinking purposes by the State or local authority having jurisdiction.

(6) "Toilet facility," means a fixture maintained within a toilet room for the purpose of defecation or urination, or both.

(7) "Toilet room," means a room maintained within or on the premises of any place of employment, containing toilet facilities for use by employees.

(8) "Toxic material" means a material in concentration or amount which exceeds the applicable limit established by a standard, such as chapter 296-62 WAC or, in the absence of an applicable standard, which is of such toxicity so as to constitute a recognized hazard that is causing or is likely to cause death or serious physical harm.

(9) "Urinal" means a toilet facility maintained within a toilet room for the sole purpose of urination.

(10) "Water closet" means a toilet facility maintained within a toilet room for the purpose of both defecation and urination and which is flushed with water.

(11) "Wet process" means any process or operation in a workroom which normally results in surfaces upon which employees may walk or stand becoming wet. [Order 74-27, § 296-24-12002, filed 5/7/74.]

WAC 296-24-12003 General requirements. House-keeping. (1) All places of employment shall be kept clean to the extent that the nature of the work allows.

(2) The floor of every workroom shall be maintained so far as practicable in a dry condition. Where wet processes are used, drainage shall be maintained and false floors, platforms, mats, or other dry standing places shall be provided, where practicable, or appropriate waterproof footwear shall be provided.

(3) To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, loose boards and unnecessary holes and openings.

(4) Cleaning and sweeping shall be done in such a manner as to minimize the contamination of the air with dust and so far as is practicable, shall be done outside of working hours. [Order 74-27, § 296-24-12003, filed 5/7/74; Order 73-5, § 296-24-12003, filed 5/9/73 and Order 73-4, § 296-24-12003, filed 5/7/73.]

WAC 296-24-12005 Water supply. (1) Potable water. (a) Potable water shall be provided in all places of employment, for drinking, washing of the person, cooking, washing of foods, washing of cooking or eating utensils, washing of food preparation or processing premises, and personal service rooms.

(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.

(c) Portable drinking water dispensers shall be designed, constructed, and serviced so that sanitary conditions are maintained, shall be capable of being closed, and shall be equipped with a tap.

(d) Ice in contact with drinking water shall be made of potable water and maintained in a sanitary condition.

(e) Open containers such as barrels, pails, or tanks for drinking water from which the water must be dipped or poured, whether or not they are fitted with a cover, are prohibited.

(f) A common drinking cup and other common utensils are prohibited.

(g) 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.

NOTE: Drinking water should be made available within 200 feet of any location at any location at which employees are regularly engaged in work.

(2) Nonpotable water. (a) Outlets for nonpotable water, such as water for industrial or firefighting purposes shall be posted or otherwise marked in a manner that will indicate clearly that the water is unsafe and is not to be used for drinking, washing of the person, cooking, washing of food, washing of cooking or eating utensils, washing of food preparation or processing premises, or personal service rooms, or for washing clothes.

(b) Construction of nonpotable water systems or systems carrying any other nonpotable substance shall be such as to prevent backflow or backsiphonage into a potable water system.

Nonpotable water shall not be used for washing any portion of the person, cooking or eating utensils, or clothing. Nonpotable water may be used for cleaning work premises, other than food processing and preparation premises and personal service rooms: Provided, That this nonpotable water does not contain concentrations of chemicals, fecal coliform, or other substances which could create unsanitary conditions or be harmful to employees. [Order 74-27, § 296-24-12005, filed 5/7/74; Order 73-5, § 296-24-12005, filed 5/9/73 and Order 73-4, § 296-24-12005, filed 5/7/73.]

WAC 296-24-12007 Toilet facilities. (1) General.

(a) Except as otherwise indicated in this section, (a) toilet facilities, in 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 to table B-1.

TABLE B-1

Number of employees:	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

(i) Where toilet facilities will not be used by women, urinals may be provided instead of water closets in such cases shall not be reduced to less than 2/3 of the minimum specified.

(b) The requirements of subdivision (a) of this subsection 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.

(c) The sewage disposal method shall not endanger the health of employees.

(d) When persons other than employees are permitted the use of toilet facilities on the premise, the number of such facilities shall be appropriately increased in accordance with table B-1 of this section in determining the minimum number of toilet facilities required.

(e) Toilet paper with holder shall be provided for every water closet.

(f) Covered receptacles shall be kept in all toilet rooms used by women.

(g) For each three required toilet facilities at least one lavatory shall be located either in the toilet room or adjacent thereto. Where only one or two toilet facilities are provided at least one lavatory so located shall be provided.

(2) Construction of toilet rooms. (a) Each water closet shall occupy a separate compartment with a door and walls or partitions between fixtures sufficiently high to assure privacy.

(b) In all toilet rooms installed on or after August 31, 1971, the floor and sidewalls, including the angle formed by the floor and sidewalls, and excluding doorways and entrances, shall be watertight. The sidewalls shall be watertight to a height of at least 5 inches.

(c) The floors, walls, ceilings, partitions, and doors of all toilet rooms shall be of a finish that can be easily cleaned. In installations made on or after August 31, 1971, cove bases shall be provided to facilitate cleaning.

(3) Construction and installation of toilet facilities. (a) Every water carriage toilet facility shall be set entirely free and open from all enclosing structures and shall be so installed that the space around the facility can be easily cleaned. This provision does not prohibit the use of wall-hung-type water closets or urinals.

(b) Every water closet shall have a hinged seat made of substantial material having a nonabsorbent finish. Seats installed or replaced after June 4, 1973, shall be of the open front type.

(c) Nonwater carriage toilet facilities and disposal systems shall be in accordance with WAC 296-24-130 through WAC 296-24-13013. [Order 74-27, § 296-24-12007, filed 5/7/74; Order 73-5, § 296-24-12007, filed 5/9/73 and Order 73-4, § 296-24-12007, filed 5/7/73.]

WAC 296-24-12009 Washing facilities. (1) General. Facilities for maintaining personal cleanliness shall be provided in every place of employment pursuant to the provisions of this section. These shall be convenient for the employees for whom they are provided and shall be maintained in a sanitary condition.

(2) Lavatories. (a) Lavatories shall be made available in all places of employment in accordance with the requirements for lavatories as set forth in table B-2 of this section. 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. The requirements of this subsection do not apply to mobile crews or to normally unattended work locations if employees working at these locations have transportation readily available to nearby washing facilities which meet the other requirements of this section.

TABLE B-2

Type of employment	Number of employees	Minimum number of lavatories
Nonindustrial— office buildings public buildings, and similar establishments	1 to 15	1
	16 to 35	2
	36 to 60	3
	61 to 90	4
	91 to 125	5
	Over 125	1 additional fixture for each addi- tional 45 employees.
Industrial— factories, warehouses, loft buildings and similar establishments.	1 to 100	1 fixture for each 10 employees.
	Over 125	1 fixture for each additional 15 employees.

(b) Each lavatory shall be provided with hot and cold running water, or tepid running water.

(c) Hand soap or similar cleansing agents shall be provided.

(d) 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.

(e) Receptacles shall be provided for disposal of used towels.

(f) Warm air blowers shall provide air at not less than 90°F. and shall have means to automatically prevent the discharge of air exceeding 140°F.

(g) Electrical components of warm air blowers shall meet the requirements of WAC 296-24-950 and WAC 296-24-955.

(3) Showers. (a) Whenever showers are required by a particular standard, the showers shall be provided, in accordance with subdivisions (b) through (e) of this section.

(b) 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.

(c) Body soap or other appropriate cleansing agents convenient to the showers shall be provided as specified in this section.

(d) Showers shall be provided with hot and cold water feeding a common discharge line.

(e) Employees who use showers shall be provided with individual clean towels. [Order 74-27, § 296-24-12009, filed 5/7/74; Order 73-5, § 296-24-12009, filed 5/9/73 and Order 73-4, § 296-24-12009, filed 5/7/73.]

WAC 296-24-12011 Change rooms. (1) Whenever employees are required by a particular standard to wear protective clothing because of the possibility of contamination with toxic materials, change rooms equipped with storage facilities for street clothes and separate storage facilities for the protective clothing shall be provided.

(2) Clothes Drying Facilities. Where working clothes are provided by the employer and become wet or are washed between shifts, provisions shall be made to insure that such clothing is dry before reuse. [Order 74-27, § 296-24-12011, filed 5/7/74; Order 73-5, § 296-24-12011, filed 5/9/73 and Order 73-4, § 296-24-12011, filed 5/7/73.]

WAC 296-24-12017 Consumption of food and beverages on the premises. (1) Application. This section shall apply only where employees are permitted to consume food or beverages, or both, on the premises.

(2) Eating and drinking areas. No employee shall be allowed to consume food or beverages in a toilet room nor in any area exposed to a toxic material.

(3) In every establishment where there is exposure to injurious dusts or other toxic materials, a separate lunchroom shall be maintained unless it is convenient for the employees to lunch away from the premises. The following number of square feet per person, based on the maximum number of persons using the room at one time, shall be required:

Square feet	
Number of persons	per person
25 and less _____	13
26-74 _____	12
75-149 _____	11
150 and over _____	10

(4) Waste disposal containers. Receptacles, constructed of smooth, corrosion resistant, easily cleanable, or disposable materials, shall be provided and used for the disposal of waste food. The number, size, and location of such receptacles shall encourage their use and not result in overfilling. They shall be emptied not less frequently than once each working day, unless unused, and shall be maintained in a clean and sanitary condition. Receptacles shall be provided with a solid tight-fitting cover unless sanitary conditions can be maintained without use of a cover.

(5) Sanitary storage. No food or beverages shall be stored in toilet rooms or in an area exposed to a toxic material.

(6) Food handling. All employee food service facilities and operations shall be carried out in accordance with

sound hygienic principles. In all places of employment where all or part of the food service is provided, the food dispensed shall be wholesome, free from spoilage, and shall be processed, prepared, handled, and stored in such a manner as to be protected against contamination. [Order 76-6, § 296-24-12017, filed 3/1/76; Order 74-27, § 296-24-12017, filed 5/7/74.]

WAC 296-24-12019 Waste disposal. (1) Any receptacle used for putrescible solid or liquid waste or refuse shall be so constructed that it does not leak and may be thoroughly cleaned and maintained in a sanitary condition. Such a receptacle shall be equipped with a solid tight-fitting cover, unless it can be maintained in a sanitary condition without a cover. This requirement does not prohibit the use of receptacles which are designed to permit the maintenance of a sanitary condition without regard to the aforementioned requirements.

(2) All sweepings solid or liquid wastes, refuse, and garbage shall be removed in such a manner as to avoid creating a menace to health and as often as necessary or appropriate to maintain the place of employment in a sanitary condition. [Order 74-27, § 296-24-12019, filed 5/7/74.]

WAC 296-24-12021 Vermin control. Every building shall be so constructed, equipped, and maintained so as to restrict the entrance or harborage of rodents, insects, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected. [Order 74-27, § 296-24-12021, filed 5/7/74.]

WAC 296-24-125 Temporary labor camps. [Order 73-5, § 296-24-125, filed 5/9/73 and Order 73-4, § 296-24-125, filed 5/7/73.]

WAC 296-24-12501 Site. (1) All sites used for camps shall be adequately drained. They shall not be subject to periodic flooding, nor located within 200 feet of swamps, pools, sink holes, or other surface collections of water unless such quiescent water surfaces can be subjected to mosquito control measures. The camp shall be located so the drainage from and through the camp will not endanger any domestic or public water supply. All sites shall be graded, ditched, and rendered free from depressions in which water may become a nuisance.

(2) All sites shall be adequate in size to prevent overcrowding of necessary structures. The principal camp area in which food is prepared and served and where sleeping quarters are located shall be at least 500 feet from any area in which livestock is kept.

(3) The grounds and open areas surrounding the shelters shall be maintained in a clean and sanitary condition free from rubbish, debris, waste paper, garbage, or other refuse.

(4) Whenever the camp is closed for the season or permanently, all garbage, manure, and other refuse shall be collected and so disposed of as to prevent nuisance. All abandoned privy pits shall be filled with earth and the grounds and buildings left in a clean and sanitary condition. If privy buildings remain, they shall be locked

or otherwise secured to prevent entrance. [Order 73-5, § 296-24-12501, filed 5/9/73 and Order 73-4, § 296-24-12501, filed 5/7/73.]

WAC 296-24-12503 Shelter. (1) Every shelter in the camp shall be constructed in a manner which will provide protection against the elements.

(2) Each room used for sleeping purposes shall contain at least 50 square feet of floor space for each occupant. At least a 7-foot ceiling shall be provided.

(3) Beds, cots, or bunks, and suitable storage facilities such as wall lockers for clothing and personal articles shall be provided in every room used for sleeping purposes. Such beds or similar facilities shall be spaced not closer than 36 inches both laterally and end to end, and shall be elevated at least 12 inches from the floor. If double-deck bunks are used, they shall be spaced not less than 48 inches both laterally and end to end. The minimum clear space between the lower and upper bunk shall be not less than 27 inches. Triple-deck bunks are prohibited.

(4) The floors of each shelter shall be constructed of wood, asphalt, or concrete. Wooden floors shall be of smooth and tight construction. The floors shall be kept in good repair.

(5) All wooden floors shall be elevated not less than 1 foot above the ground level at all points to prevent dampness and to permit free circulation of air beneath.

(6) Nothing in this section shall be construed to prohibit "banking" with earth or other suitable material around the outside walls in areas subject to extreme low temperatures.

(7) All living quarters shall be provided with windows the total of which shall be not less than one-tenth of the floor area. At least one-half of each window shall be so constructed that it can be opened for purposes of ventilation.

(8) All exterior openings shall be effectively screened with 16-mesh material. All screen doors shall be equipped with self-closing devices.

(9) Each dwelling unit shall have at least 70 square feet of floor space for the first occupant and at least 50 square feet of floor space for each additional occupant. A separate sleeping area shall be provided for the husband and wife in all family units in which one or more children over six years of age are housed.

(10) In camps where cooking facilities are used in common, stoves (in ratio of one stove to 10 persons or one stove to two families) shall be provided in an enclosed and screened shelter. Sanitary facilities shall be provided for storing and preparing food.

(11) If a camp is used during cold weather, adequate heating equipment shall be provided.

NOTE: All heating, cooking, and water heating equipment shall be installed in accordance with State and local ordinances, codes, and regulations governing such installations.

[Order 73-5, § 296-24-12503, filed 5/9/73 and Order 73-4, § 296-24-12503, filed 5/7/73.]

[Title 296 WAC—p 286]

WAC 296-24-12505 Water supply. (1) An adequate and convenient water supply, approved by the appropriate health authority, shall be provided in each camp for drinking, cooking, bathing, and laundry purposes.

(2) A water supply shall be deemed adequate if it is capable of delivering 35 gallons per person per day to the campsite at a peak rate of 2 1/2 times the average hourly demand.

(3) The distribution lines shall be capable of supplying water at normal operating pressures to all fixtures for simultaneous operation. Water outlets shall be distributed throughout the camp in such a manner that no shelter is more than 100 feet from a yard hydrant if water is not piped to the shelters.

(4) Where water under pressure is available, one or more drinking fountains shall be provided for each 100 occupants or fraction thereof. The construction of drinking fountains shall comply with ANSI Standard Specifications for Drinking Fountains, Z4.2-1942. Common drinking cups are prohibited. [Order 73-5, § 296-24-12505, filed 5/9/73 and Order 73-4, § 296-24-12505, filed 5/7/73.]

WAC 296-24-12507 Toilet facilities. (1) Toilet facilities adequate for the capacity of the camp shall be provided.

(2) Each toilet room shall be located so as to be accessible without any individual passing through any sleeping room. Toilet rooms shall have a window not less than 6 square feet in area opening directly to the outside area or otherwise be satisfactorily ventilated. All outside openings shall be screened with 16-mesh material. No fixture, water closet, chemical toilet, or urinal shall be located in a room used for other than toilet purposes.

(3) A toilet room shall be located within 200 feet of the door of each sleeping room. No privy shall be closer than 100 feet to any sleeping room, dining room, lunch area, or kitchen.

(4) Where the toilet rooms are shared, such as in multi-family shelters and in barracks type facilities, separate toilet rooms shall be provided for each sex. These rooms shall be distinctly marked "for men" and "for women" by signs printed in English and in the native language of the persons occupying the camp, or marked with easily understood pictures or symbols. If the facilities for each sex are in the same building, they shall be separated by solid walls or partitions extending from the floor to the roof or ceiling.

(5) Where toilet facilities are shared, the number of water closets or privy seats provided for each sex shall be based on the maximum number of persons of that sex which the camp is designed to house at any one time, in the ration of one such unit to each 15 persons, with a minimum of two units for any shared facility.

(6) Urinals shall be provided on the basis of one unit or 2 linear feet of urinal trough for each 25 men. The floor from the wall and for a distance not less than 15 inches measured from the outward edge of the urinals shall be constructed of materials impervious to moisture. Where water under pressure is available, urinals shall be provided with an adequate water flush. Urinal troughs in

privies shall drain freely into the pit or vault and the construction of this drain shall be such as to exclude flies and rodents from the pit.

(7) Every water closet installed after the effective date of these standards shall be located in a toilet room.

(8) Each toilet room shall be lighted naturally, or artificially at all hours of the day and night as specified in WAC 296-24-12513.

(9) An adequate supply of toilet paper shall be provided in each privy, water closet, or chemical toilet compartment.

(10) Privies and toilet rooms shall be kept in a sanitary condition. They shall be cleaned at least daily. [Order 73-5, § 296-24-12507, filed 5/9/73 and Order 73-4, § 296-24-12507, filed 5/7/73.]

WAC 296-24-12509 Sewage disposal facilities. In camps where public sewers are available, all sewer lines and floor drains from buildings shall be connected thereto. [Order 73-5, § 296-24-12509, filed 5/9/73 and Order 73-4, § 296-24-12509, filed 5/7/73.]

WAC 296-24-12511 Laundry, handwashing, and bathing facilities. (1) Laundry, handwashing, and bathing facilities shall be provided in the following ratio:

(a) Handwash basin per family shelter or per six persons in shared facilities.

(b) Shower head for every 10 persons.

(c) Laundry tray or tub for every 30 persons.

(d) Slop sink in each building used for laundry, hand washing, and bathing.

(2) Floors shall be of smooth finish but not slippery materials; they shall be impervious to moisture. Floor drains shall be provided in all shower baths, shower rooms, or laundry rooms to remove waste water and facilitate cleaning. All junctions of the curbing and the floor shall be coved. The walls and partitions of shower rooms shall be smooth and impervious to the height of splash.

(3) An adequate supply of hot and cold running water shall be provided for bathing and laundry purposes. Facilities for heating water shall be provided.

(4) Every service building shall be provided with equipment capable of maintaining a temperature of at least 70°F. during cold weather.

(5) Facilities for drying clothes shall be provided.

(6) All service buildings shall be kept clean. [Order 73-5, § 296-24-12511, filed 5/9/73 and Order 73-4, § 296-24-12511, filed 5/7/73.]

WAC 296-24-12513 Lighting. Where electric service is available, each habitable room in a camp shall be provided with at least on ceiling-type light fixture and at least one separate floor-or wall-type convenience outlet. Laundry and toilet rooms and rooms where people congregate shall contain at least one ceiling-or wall-type fixture. Light levels in toilet and storage rooms shall be at least 20 foot-candles 30 inches from the floor. Other rooms, including kitchens and living quarters, shall be at least 30 foot-candles 30 inches from the floor. [Order 73-5, § 296-24-12513, filed 5/9/73 and Order 73-4, § 296-24-12513, filed 5/7/73.]

WAC 296-24-12515 Refuse disposal. (1) Fly-tight, rodent-tight, impervious, cleanable or single service containers, approved by the State Board of Health shall be provided for the storage of garbage. At least one such container shall be provided for each family shelter and shall be located within 100 feet of each shelter on a wooden, metal, or concrete stand.

(2) Garbage containers shall be kept clean.

(3) Garbage containers shall be emptied when full, but not less than twice a week. [Order 73-5, § 296-24-12515, filed 5/9/73 and Order 73-4, § 296-24-12515, filed 5/7/73.]

WAC 296-24-12517 Construction and operation of kitchens, dining hall, and feeding facilities. (1) In all camps where central dining or multiple family feeding operations are permitted or provided, the food handling facilities shall comply with the requirements of the "Food Service Sanitation Ordinance and Code," Part V of the "Food Service Sanitation Manual," U.S. Public Health Service Publication 934 (1965).

(2) A properly constructed kitchen and dining hall adequate in size, separate from the sleeping quarters of any of the workers or their families, shall be provided in connection with all food handling facilities. There shall be no direct opening from living or sleeping quarters into a kitchen or dining hall.

(3) No person with any communicable disease shall be employed or permitted to work in the preparation, cooking, serving, or other handling of food, foodstuffs, or materials used therein, in any kitchen or dining room operated in connection with a camp or regularly used by persons living in a camp. [Order 73-5, § 296-24-12517, filed 5/9/73 and Order 73-4, § 296-24-12517, filed 5/7/73.]

WAC 296-24-12519 Insect and rodent control. Effective measures shall be taken to prevent infestation by and harborage of animal or insect vectors or pests. [Order 73-5, § 296-24-12519, filed 5/9/73 and Order 73-4, § 296-24-12519, filed 5/7/73.]

WAC 296-24-12521 First aid. (1) Adequate first aid facilities approved by a health authority shall be maintained and made available in every labor camp for the emergency treatment of injured persons.

(2) Such facilities shall be in charge of a person trained to administer first aid and shall be readily accessible for use at all times. [Order 73-5, § 296-24-12521, filed 5/9/73 and Order 73-4, § 296-24-12521, filed 5/7/73.]

WAC 296-24-12523 Reporting communicable disease. (1) It shall be the duty of the camp superintendent to report immediately to the local health officer the name and address of any individual in the camp known to have or suspected of having a communicable disease.

(2) Whenever there shall occur in any camp a case of suspected food poisoning or an unusual prevalence of any illness in which fever, diarrhea, sore throat, vomiting, or jaundice is a prominent symptom, it shall be the duty of the camp superintendent to report immediately

the existence of the outbreak to the local health officer or State Board of Health by telegram or telephone. [Order 73-5, § 296-24-12523, filed 5/9/73 and Order 73-4, § 296-24-12523, filed 5/7/73.]

WAC 296-24-130 Nonwater carriage disposal systems. [Order 73-5, § 296-24-130, filed 5/9/73 and Order 73-4, § 296-24-130, filed 5/7/73.]

WAC 296-24-13001 Acceptable industrial disposal systems. (1) The waste disposal systems described in (2), (3), (4), (5), (6), or (7) of this section, may be used only where not prohibited by codes and regulations of local authorities, and where water closets are not feasible due either to the lack of an adequate water supply or to the location or temporary nature of the operation requiring the facility. The number of units required for a place of employment shall be as specified in WAC 296-24-12007 and WAC 296-24-12507.

(2) Privies constructed in conformity with WAC 296-24-13003 may be used for the disposal of human excreta where their use will not contaminate ground or surface water because of privy location, type of soil, or ground-water table.

(3) Chemical toilets constructed in conformity with WAC 296-24-13005 may be used in place of privies or where a privy is not permitted due to possible contamination of ground and surface water.

(4) Recirculating toilets constructed in conformity with WAC 296-24-13011 may be used in place of privies or chemical toilets.

(5) Combustion toilets constructed in conformity with WAC 296-24-13009 may be used in place of privies, chemical toilets, or recirculating toilets.

(6) Portable toilets constructed in conformity with WAC 296-24-13013 may be used for temporary or mobile installations. Such temporary units may be:

(a) Chemical, recirculating, or combustion toilets designed for installation in or as an integral part of a skid mounted portable privy building, or in a separate toilet room, or

(b) Portable privies designed for installation over a manhole of a sanitary or a combined waste water sewer system.

(7) A seepage pit constructed in conformity with WAC 296-24-13007 may be used for the disposal of waste water from culinary activity, temporary bathing facilities, and clothes washing facilities where there is no available piped water supply. Human excreta shall not be discharged into a seepage pit. All units described in this section shall comply with applicable codes and regulations of local authorities. [Order 73-5, § 296-24-13001, filed 5/9/73 and Order 73-4, § 296-24-13001, filed 5/7/73.]

WAC 296-24-13003 Privy specifications. (1) A privy pit shall be separated by a minimum distance of 100 feet between the privy and a well, spring, or other source of water supply for drinking, bathing, or culinary purposes.

(a) At no time shall the pit bottom of a privy extend into ground water, nor shall it be constructed within 100

feet of the shoreline of any open body of water. Phreatic water, such as may be found in surface soil at depths of 10 feet or less, shall not be interpreted as ground water unless there is evidence of positive directional flow through the pit.

(b) The privy shall be so located and so constructed that no surface water may enter into the pit either as runoff or as flood water.

(c) The pit shall be constructed of such material and in such a manner as to prevent rapid deterioration, provide adequate capacity, and facilitate maintenance in a satisfactory manner under ordinary conditions of usage.

(d) The pit and seat area shall be vented by a flue or vent pipe having not less than 7 square inches cross-sectional area, so as to provide a continuous escape of odors.

(e) The pit shall provide a capacity of 50 cubic feet for each seat installed in the privy building. The vault within 16 inches of the surface grade shall not be counted as part of the 50-cubic-foot capacity.

(f) Pit cribbing shall fit firmly and be in uniform contact with the earth walls on all sides, and shall rise at least 6 inches above the original ground line and descend to the full depth of the pit. However, pit cribbing below the soil line may be omitted in rock formations.

(g) An earth plateau shall be constructed level with the top of the pit cribbing, and extend horizontally for a distance of at least 18 inches before sloping to the original ground level.

(2) Privy building shall be firmly anchored, rigidly constructed, and free from hostile surface features, such as exposed nail points, sharp edges, rough or broken boards, etc., and shall provide privacy and protection from the elements. It shall be ventilated by leaving a 4-inch opening at the top of all the walls just beneath the roof.

(a) The building shall be of fly-tight construction, doors shall be self-closing, and vent and building openings shall be screened with 16-mesh screen of durable material. The vent shall extend 12 inches above the roof.

(b) The seat shall be so spaced as to provide a minimum clear space of 24 inches between each seat in multiple unit installations, and shall provide 12 inches clear space from the seat opening to the side wall in single and multiple units.

(c) The seat riser shall have an inside clearance of not less than 21 inches from the front wall and not less than 24 inches from the rear wall of the privy building.

(d) The seat top shall be not less than 12 inches nor more than 16 inches above the floor.

(e) The seat opening shall be covered with an attached, movable toilet seat and lid, so constructed and installed that when closed it will limit access of insects, and which can be raised to allow sanitary use as a urinal.

(f) The floor and riser shall be built of impervious material or tongue and groove lumber, and in a manner to deny access of insects.

(g) Where electricity is available, lighting shall be provided with an intensity of not less than 10 foot-candles 30 inches above the floor.

(h) A conveniently located receptacle or dispenser containing an adequate supply of toilet paper shall be provided for each seat in each privy building. [Order 73-5, § 296-24-13003, filed 5/9/73 and Order 73-4, § 296-24-13003, filed 5/7/73.]

WAC 296-24-13005 Chemical toilet specifications.

(1) Rooms, buildings, or shelters housing chemical toilets shall be of sound construction and easy to clean, and shall provide shelter and privacy. The toilet rooms shall be ventilated to the outside and adequately lighted, as specified in WAC 296-24-12513 and all openings into the toilet room shall be covered with 16-mesh screen. The minimum requirements given in (2) through (7) of this section shall apply.

(2) Caustic receptacles shall be durable and corrosion proof, and provide a minimum capacity of 100 gallons per seat.

(3) The caustic receptacle charge per seat shall be a minimum of 25 pounds of caustic dissolved in 10 gallons of water.

(4) The chemical shall be drained and receptacle recharged every 6 months of continuous use, or at the beginning of each season of operation when in intermittent use, or when three-fourths full, whichever occurs first.

(5) Each seat in the building shall be provided with a conveniently located agitator.

(6) Receptacles shall be vented as prescribed in WAC 296-24-13003(1)(d).

(7) The receptacle shall be equipped with a manhole external to the privy building for cleaning and caustic removal purposes. The manhole shall be covered so as to prevent the escape of gases and odors. [Order 73-5, § 296-24-13005, filed 5/9/73 and Order 73-4, § 296-24-13005, filed 5/7/73.]

WAC 296-24-13007 Seepage pit construction. (1) Seepage pit construction shall conform with requirements for privy pit construction in WAC 296-24-13003(1)(a), (b), (c), (f), and (g). The seepage pit may be filled with stone or rubble of not less than nominal 1 inch diameter.

(2) Seepage pits shall be of such dimensions as to provide side wall area equal to at least 10 square feet per person served by the facility, or such greater area as may be required by the health agency having jurisdiction.

(3) Temporary piping connections from sinks or shower platforms may be discharged beneath the floor if they have traps in accordance with the provisions of American National Standard National Plumbing Code, A 40.8-1955.

(4) The platform covering the seepage pits shall be built of impervious material and in a manner to exclude insects.

(5) The platform shall be provided with an opening at least 1 foot in each dimension and have a rim at least 1 inch above the floor to prevent precipitation from accumulating on the platform floor.

(6) The platform opening shall be covered with a self-closing lid, so constructed that it can be easily opened by foot or hand, and so installed that when closed it will

exclude insects and fit closely over the raised rim of the opening. [Order 73-5, § 296-24-13007, filed 5/9/73 and Order 73-4, § 296-24-13007, filed 5/7/73.]

WAC 296-24-13009 Combustion toilet. (1) Combustion toilets and combination toilet buildings, rooms, or shelters shall conform to the applicable specifications given for chemical toilets in WAC 296-24-13005.

(2) All external surfaces, including bowl and hopper, shall be easy to clean.

(3) The residue must be sterile and inert.

(4) The flue effluents shall be free of bacteria.

(5) The combustion system and all fuel and electrical parts shall be safe and in compliance with applicable gas and electrical codes of local authorities. Where such codes do not exist, the installations shall comply with the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968). [Order 73-5, § 296-24-13009, filed 5/9/73 and Order 73-4, § 296-24-13009, filed 5/7/73.]

WAC 296-24-13011 Recirculating toilet specifications. (1) Recirculating toilet buildings, rooms, or shelters shall conform to the applicable specifications given for chemical toilets in WAC 296-24-13005.

(2) All materials, bowl, piping, and fittings shall be corrosion resistant.

(3) Waste passages shall have smooth surfaces and be free of obstructions, recesses, or chambers that would permit fouling.

(4) Flushing shall be accomplished by a single control so arranged as to be operated without special knowledge or effort.

(5) Recirculating toilets shall conform to "Self-Contained, Electrically Operated Recirculating, Chemically Controlled Toilet," International Association of Plumbing and Mechanical Officials Trailer Standard TSC 12-1965.

(6) The unit shall be maintained and cleaned; and water, filter, and odor-controlling chemical shall be replaced in accordance with the instructions of the manufacturer. [Order 73-5, § 296-24-13011, filed 5/9/73 and Order 73-4, § 296-24-13011, filed 5/9/73.]

WAC 296-24-13013 Portable toilet construction. (1) A portable toilet may comprise the seat and its treatment unit to be installed in a structure, or it may comprise an entire prefabricated, skid mounted, or otherwise portable structure containing a seat or treatment units with seat.

(2) No pit, tank, or other subsurface structure shall be construed as part of a portable toilet.

(a) Portable privies must be installed over a pit conforming to WAC 296-24-13003(1), or a manhole that is part of a sanitary or combined waste water disposal system.

(b) No portable toilet shall discharge into a storm sewer.

(3) A portable building shall be rigidly constructed, ventilated by a screened opening or a vent having a cross-sectional area of at least 1 square foot per seat, and equipped with a floor, riser, and seat meeting the

requirements of WAC 296-24-13003(2) or an equivalent individual stool and seat in prefabricated metal, fiber glass, plastic, or ceramic material.

(a) The structure shall provide privacy and protection from the elements.

(b) An airtight seal shall be provided between the structure base and any pit, receptacle, or manhole over which it is placed.

(c) Ventilation of the pit, receptacle, or manhole shall conform to WAC 296-24-13003(1)(d).

(4) A portable toilet shall be provided with facilities, requisite to its construction, for the removal of chemicals, ash, or residue. All surfaces subject to soiling shall be readily accessible and easily cleaned. [Order 73-5, § 296-24-13013, filed 5/9/73 and Order 73-4, § 296-24-13013, filed 5/7/73.]

Part B-2

SAFETY COLOR CODE FOR MARKING PHYSICAL HAZARDS, ETC., WINDOW WASHING

WAC

296-24-135	Safety color code for marking physical hazards.
296-24-13501	Color identification.
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296-24-140	Specifications for accident prevention signs and tags.
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WAC 296-24-135 Safety color code for marking physical hazards. [Order 73-5, § 296-24-135, filed 5/9/73 and Order 73-4, § 296-24-135, filed 5/7/73.]

WAC 296-24-13501 Color identification. (1) Red. Red shall be the basic color for the identification of:

(a) Fire protection equipment and apparatus. (i) Fire alarm boxes (pull boxes).

(ii) Fire blanket boxes,

(iii) Fire buckets or pails.

(iv) Fire exit signs.

(v) Fire extinguishers (if painting the extinguisher is impractical or undesirable, color should be used on the housing, wall, or support to identify the location).

(vi) Fire hose locations (color should be used on the reel, supports, or housing but not on the hose).

(vii) Fire hydrants (industrial).

(viii) Fire pumps.

(ix) Fire sirens.

(x) Post indicator valves for sprinkler system (it is suggested that if a traffic hazard is involved, the top

should be colored red, and the barrel or post yellow and black stripes).

(xi) Sprinkler piping. (See ANSI Standard Scheme for the Identification of Piping Systems, A13.1-1956.)

(b) Danger. Safety cans or other portable containers of flammable liquids having a flashpoint at or below 80°F. table containers of flammable liquids (open cup tester), excluding shipping containers, shall be painted red with some additional clearly visible identification either in the form of a yellow band around the can or the name of the contents conspicuously stenciled or painted on the can in yellow. Red lights shall be provided at barricades and at temporary obstructions, as specified in ANSI Safety Code for Building Construction, A10.2-1944. Danger signs shall be painted red.

(c) Stop. Emergency stop bars on hazardous machines such as rubber mills, wire blocks, flat work ironers, etc., shall be red. Stop buttons or electrical switches used for emergency stopping of machinery shall be red.

(2) Orange. Orange shall be used as the basic color for designating dangerous parts of machines or energized equipment which may cut, crush, shock, or otherwise injure and to emphasize such hazards when enclosure doors are open or when gear belt, or other guards around moving equipment are open or removed, exposing unguarded hazards.

(3) Yellow. Yellow shall be the basic color for designating caution and for marking physical hazards such as: striking against, stumbling, falling, tripping, and "caught in between". Solid yellow, yellow and black stripes, yellow and black checkers (or yellow with suitable contrasting background) should be used interchangeably, using the combination which will attract the most attention in the particular environment. Yellow shall be the basic color for designating caution, limited to warning against the starting, the use of, or the movement of equipment under repair or being worked upon.

(4) Green. Green shall be used as the basic color for designating "Safety" and the location of first aid equipment (other than firefighting equipment).

(5) Purple. Purple shall be the basic color for designating radiation hazards. "Radiation" as used in this subdivision refers to radiation types such as X-ray, alpha, beta, gama, neutron, proton, deuteron, and meson. Yellow should be used in combination with purple for markers such as tags, labels, signs, and floor markers.

(6) Black, White, or Combinations of Black and White. Black, white, or a combination of these two, shall be the basic colors for the designation of traffic and housekeeping markings. Solid white, solid black, single color striping, alternate stripes of black and white, or black and white checkers should be used in accordance with local conditions. [Order 73-5, § 296-24-13501, filed 5/9/73 and Order 73-4, § 296-24-13501, filed 5/7/73.]

WAC 296-24-13503 Color specifications. Colors shall meet the tests specified in section 3, Color Definitions, of ANSI Z53.1-1971, Safety Color Code for Marking Physical Hazards. [Order 73-5, § 296-24-13503, filed 5/9/73 and Order 73-4, § 296-24-13503, filed 5/7/73.]

WAC 296-24-140 Specifications for accident prevention signs and tags. [Order 73-5, § 296-24-140, filed 5/9/73 and Order 73-4, § 296-24-140, filed 5/7/73.]

WAC 296-24-14001 Scope. (1) These specifications apply to the design, application, and use of signs or symbols (as included in WAC 296-24-14005 through WAC 296-24-14009 intended to indicate and, insofar as possible, to define specific hazards of a nature such that failure to designate them may lead to accidental injury to workers. These specifications are intended to cover all safety signs except those designed for streets, highways, railroads, and marine regulations. These specifications do not apply to plant bulletin boards or to safety posters.

(2) All new signs and replacements of old signs after August 27, 1971 shall be in accordance with these specifications. [Order 76-6, § 296-24-14001, filed 3/1/76; Order 73-5, § 296-24-14001, filed 5/9/73 and Order 73-4, § 296-24-14001, filed 5/7/73.]

WAC 296-24-14003 Definitions. As used in this section, the word "sign" refers to a surface on which letters or other markings appear, prepared for the warning of, or safety instructions of, industrial workers who may be exposed to hazards. Excluded from this definition, however, are news releases, displays commonly known as safety posters, and bulletins used for employee education. [Order 73-5, § 296-24-14003, filed 5/9/73 and Order 73-4, § 296-24-14003, filed 5/7/73.]

WAC 296-24-14005 Classification of signs according to use. (1) **Danger Signs.** (a) Danger signs should be used only where an immediate hazard exists. There shall be no variation in the type of design or signs posted to warn of specific dangers and radiation hazards.

(b) All employees shall be instructed that danger signs indicate immediate danger and that special precautions are necessary.

(2) **Caution Signs.** (a) Caution signs shall be used only to warn against potential hazards or to caution against unsafe practices.

(b) All employees shall be instructed that caution signs indicate a possible hazard against which proper precaution should be taken.

(3) **Safety Instruction Signs.** Safety instruction signs shall be used where there is a need for general instructions and suggestions relative to safety measures. [Order 73-5, § 296-24-14005, filed 5/9/73 and Order 73-4, § 296-24-14005, filed 5/7/73.]

WAC 296-24-14007 Sign design and colors. (1) **Design Features.** The colors, proportions, and location of the identification panels on each sign shall be in accordance with this section. All signs shall be furnished with rounded or blunt corners and shall be free from sharp edges, burrs, splinters, or other sharp projections. The ends or heads of bolts or other fastening devices shall be located in such a way that they do not constitute a hazard. When conditions warrant the use of a sign size not covered in the following tables, the ratio of the depth of the identifying panel (Danger, Caution, etc.) to the

width of the sign shall be as established in Tables J-1 to J-4.

(2) **Danger Signs.** (a) The colors red, black, and white shall be those of opaque glossy samples as specified in Table 1 of Fundamental Specification of Safety Colors for CIE Standard Source "C", American National Standard Z53.1-1971.

(b) Standard Proportions shall be as indicated in Table J-1, and format shall be as in Fig. J-1.

(3) **Radiation Warning Signs.** (a) Standard color of the background shall be yellow; the panel, reddish purple with yellow letters; the symbol, reddish purple; any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of American National Standard, Z53.1-1971.

(b) The standard symbol shall be as in Figure J-3. Method of dimensioning, design, and orientation of the standard symbol (one blade pointed downward and centered on the vertical axis) shall be executed as illustrated. The symbol shall be prominently displayed, and of a size consistent with the size of the equipment or material or area to which it is attached.

(c) Format shall be as in Figure J-2. Sign proportions shall be the same as those for danger signs in Table J-1.

(4) **Caution Signs.** (a) Standard color of the background shall be yellow; and the panel, black with yellow letters. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of American National Standard Z53.1-1971.

(b) Standard proportions shall be as indicated in Table J-2, and format shall be as in Figure J-4.

(5) **Exit Signs.** Exit signs shall be in accordance with WAC 296-24-56531.

(6) **Safety Instruction Signs.** (a) Standard color of the background shall be white; and the panel, green with white letters. Any letters used against the white background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of American National Standard, Z53.1-1971.

(b) Standard proportions shall be as indicated in Table J-3, and format shall be as in Figure J-5.

(7) **Directional Signs.** (a) Standard color of the background shall be white; and the panel, black with white directional symbol. Any letters used against the white background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1 of American National Standard Z53.1-1971.

(b) Standard proportions shall be as indicated in Table J-4, and format shall be as in Figure J-6.

(8) **In-Plant Traffic Signs.** Regulatory and control signs required for the safe movement of vehicles and pedestrians on thoroughfares on plant property shall conform to the standards established in American National Standard Manual on Uniform Traffic Control Devices for Streets and Highways, D6.1-1971.

(9) **Informational Signs.** Blue shall be the standard color for informational signs. It may be used as the background color for the complete sign or as a panel at the top of such types of "Notice" signs, which have a white background. The colors shall be those of opaque

glossy samples as specified in Table 1 of American National Standard Z53.1-1971.

(10) Slow-moving Vehicle Emblem. This emblem (see Fig. J-7) 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. The emblem is not a clearance marker for wide machinery nor is it intended to replace required lighting or marking of slow-moving vehicles. Neither the color film pattern and its dimensions nor the backing shall be altered to permit use of advertising or other markings. The material, location, mounting, etc., of the emblem shall be in accordance with the American Society of Agricultural Engineers Emblem for Identifying Slow-Moving Vehicles, ASAE R276, 1967, or ASAE S276.2 (ANSI B114.1-1971).

(11) Symbols. Symbols used on signs shall follow recognized practices, such as in Figure J-8. For radioactive materials, see symbol in Figure J-3. [Order 73-5, § 296-24-14007, filed 5/9/73 and Order 73-4, § 296-24-14007, filed 5/7/73.]

WAC 296-24-14009 Sign wordings. (1) Examples of Wordings. The lists in (3) through (7) of this section are intended to serve as a guide for choosing the correct sign design for the message to be displayed.

(2) Nature of Wording. The wording of any sign should be easily read and concise. The sign should contain sufficient information to be easily understood. The wording should make a positive, rather than negative suggestion and should be accurate in fact.

(3) Danger Signs.

Danger—Keep Off, Electric Current.
 Danger—No Smoking, Matches, or Open Lights.
 Danger—Men Working Above.
 Danger—Not Room Enough Here to Clear Men on Cars.
 Danger—Keep Away.
 Danger—Men in Boiler.
 Danger—Insufficient Clearance.
 Danger—2,300 Volts.
 Danger—Keep Out.
 Danger—Crane Overhead.
 Danger—Keep Off.

(4) Biological Hazard Signs. The biological hazard warning shall be used to signify the actual or potential presence of a biohazard and to identify equipment, containers, rooms, materials, experimental animals, or combinations thereof, which contain, or are contaminated with, viable hazardous agents. For the purpose of this subdivision the term "biological hazard," or "biohazard," shall include only those infectious agents presenting a risk or potential risk to the well-being of man. The biohazard symbol shall be designed and proportioned as illustrated in Figure J-9. The symbol design shall be a

fluorescent orange or orange-red color. Background color is optional as long as there is sufficient contrast for the symbol to be clearly defined. Appropriate wording may be used in association with the symbol to indicate the nature or identity of the hazard, name of individual responsible for its control, precautionary information, etc., but never should this information be superimposed on the symbol.

(5) Caution Signs.

Caution—Do Not Operate, Men Working on Repairs.
 Caution—Hands Off Switch, Men Working on Line.
 Caution—Working on Machines, Do Not Start.
 Caution—Goggles Must Be Worn When Operating This Machine.
 Caution—This Door Must Be Kept Closed.
 Caution—Electric Trucks, Go Slow.
 Caution—This Space Must Be Kept Clear at All Times.
 Caution—Stop Machinery to Clean, Oil, or Repair.
 Caution—Keep Aisles Clear.
 Caution—Operators of This Machine Shall Wear Snug Fitting Clothing—No Gloves.
 Caution—Close Clearance
 Caution—Watch Your Step.
 Caution—Electric Fence.

(6) Safety Instruction Signs.

Report All Injuries to the First-Aid Room at Once.
 Walk—Don't Run.
 Report All Injuries No Matter How Slight.
 Think, If Safe Go Ahead.
 Make Your Work Place Safe Before Starting the Job.
 Report All Unsafe Conditions to Your Foreman.
 Help Keep This Plant Safe and Clean.

(7) Directional Signs.

This Way Out (below arrow panel).
 This Way (inside arrow) Out (below arrow panel).
 Fire Exit (below arrow panel).
 Fire (inside arrow) Extinguisher (below arrow panel).
 To the (inside arrow) Fire Escape (below arrow panel).
 To the (inside arrow) First Aid (below arrow panel).
 Manway (below arrow panel).
 This Way to (inside arrow) First-Aid Room (below arrow panel).

(8) Informational Signs.

No Trespassing Under Penalty of the Law.
 This Elevator Is for Freight Only, Not for Passengers.
 No Admittance Except to Employees on Duty.
 No Admittance.
 No Admittance, Apply at Office.
 No Trespassing.
 Men.
 Women.
 For Employees Only.
 Office.

NOTE: When sign wordings such as those listed in this section are contemplated, care should be taken to be sure that they are suitable for the particular location at which the sign is to be

placed and that wording meets the requirements of the intended purpose. When there is a reasonable doubt, a sign of a standard design should be used.

[Order 73-5, § 296-24-14009, filed 5/9/73 and Order 73-4, § 296-24-14009, filed 5/7/73.]

WAC 296-24-14011 Accident prevention tags. (1) Scope and Purpose. (a) The tags are a temporary means of warning all concerned of a hazardous condition, defective equipment, radiation hazards, etc. The tags are not to be considered as a complete warning method, but should be used until a positive means can be employed to eliminate the hazard; for example, a "Do Not Start" tag on power equipment shall be used for a few moments or a very short time until the switch in the system can be locked out; a "Defective Equipment" tag shall be placed on a damaged ladder and immediate arrangements made for the ladder to be taken out of service and sent to the repair shop.

(b) The purpose of this section is to establish a set of specifications for tags based on experience and previous use. The tags are to be used in industry, mercantile establishments, or wherever such tags can be utilized to help prevent accidental injury to personnel or damage to property, or both.

(2) Definitions. The word "tag" as used in this section refers to a surface (usually card, paper, pasteboard, or some temporary or nonpermanent material) on which letters or markings, or both, appear. These letters or markings, or both, are for warning (cautioning) or safety instruction of employees who may be exposed to hazards. Tags are to be affixed to the device in question by string, wire, or adhesive.

(3) Do Not Start Tags. (a) The standard background color for Do Not Start tags shall be red. (See Fig. J-10.)

(b) Letters shall be white or grey or etched, provided that a long lasting and sharp contrast results.

(c) Do Not Start tags shall be placed in a conspicuous location or shall be placed in such a manner that they effectively block the starting mechanism which would cause hazardous conditions should the equipment be energized.

(4) Danger Tags. (a) Danger tags should be used only where an immediate hazard exists. There should be no variation in the type of design of tags posted or hung to warn of specific dangers. (See Fig. J-11.)

(b) All employees should be instructed that Danger tags indicate immediate danger and that special precautions are necessary.

(5) Caution Tags. (a) Caution tags should be used only to warn against potential hazards or to caution against unsafe practices. (See Fig. J-12.)

(b) All employees should be instructed that Caution tags indicate a possible hazard against which proper precautions should be taken.

(6) Out of Order Tags. Out of Order tags should be used only for the specific purpose of indicating that a piece of equipment, machinery, etc., is out of order and to attempt to use it might present a hazard. (See Fig. J-13.)

(7) Radiation Tags. (a) The standard background for Radiation tags shall be yellow; the panel shall be reddish purple. Any letters used against the yellow background shall be black. The colors shall be those of opaque glossy samples as specified in Table 1, Fundamental Specification of Safety Colors for CIE Standard Source "C" American National Standard Safety Color Code for Marking Physical Hazards and the Identification of Certain Equipment, Z53.1-1971.

(b) The method of dimension, design, and orientation of the standard symbol (one blade pointed downward and centered on the vertical axis) shall be executed as illustrated in Figure J-14. The symbol shall be prominently displayed and of a size consistent with the size of the equipment or area in which it is to be used.

(8) Biological Hazard Tags. (a) The standard background color for the Biological Hazard symbol is optional as long as there is sufficient contrast for the symbol to be clearly defined. The symbol design (See Fig. J-15) shall be a fluorescent orange or orange-red color.

(b) The Biological Hazard tag shall be used to signify the actual or potential presence of a biohazard, to identify equipment, containers, rooms, materials, experimental animals, or combinations thereof, which contain or are contaminated with viable hazardous agents.

(c) For the purpose of this section the term "biological hazard" shall include only those infectious agents presenting a risk or potential risk to the well-being of man.



Fig. J-1
Danger Sign

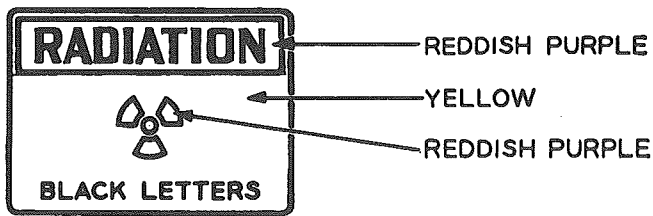


Fig. J-2
Radiation Warning Sign

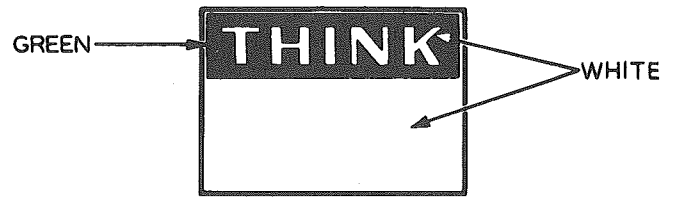


Fig. J-5

Safety Instruction Signs

(NOTE: The words "Think" and "Be Careful," given here, are only illustrations. Other wordings may be used.)

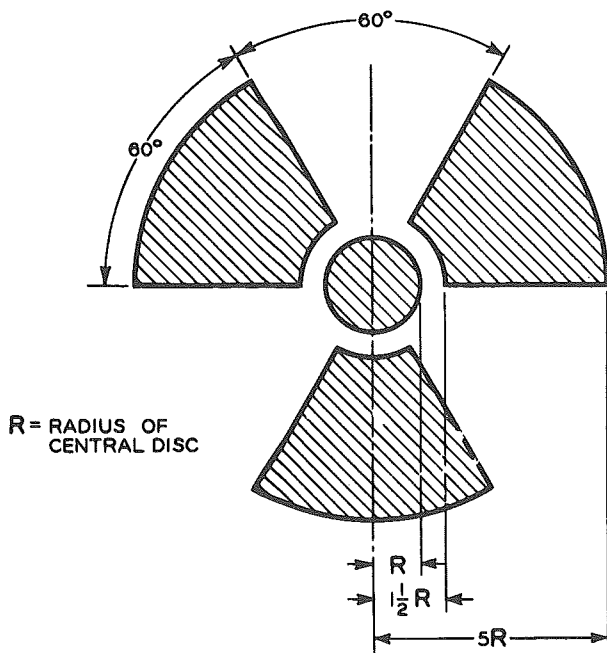


Fig. J-3
Standard Radiation Symbol



Fig. J-6
Directional Signs

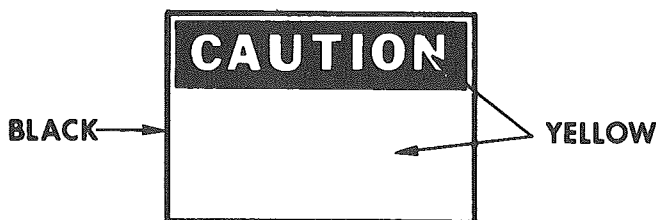


Fig. J-4
Caution Sign

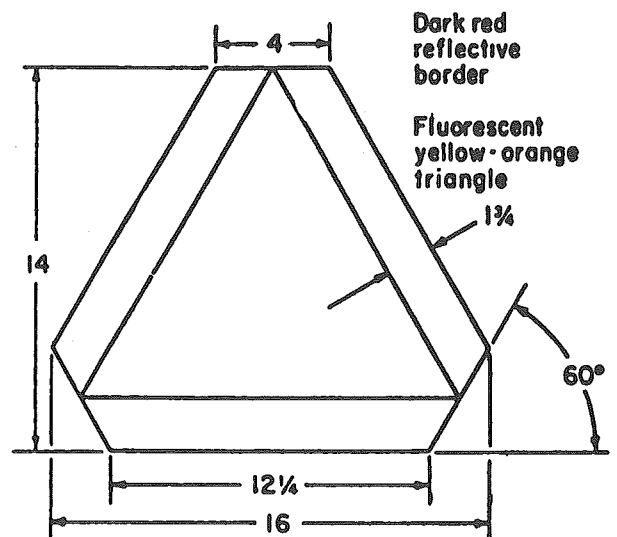


Fig. J-7

Slow-Moving Vehicle Emblem

NOTE: All dimensions are in inches.

POISON:



ELECTRICITY:

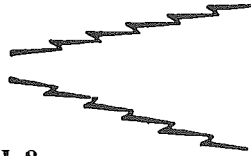
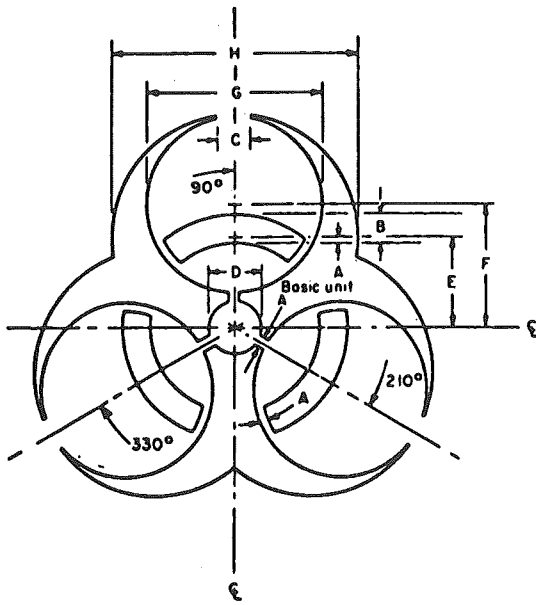


Fig. J-8

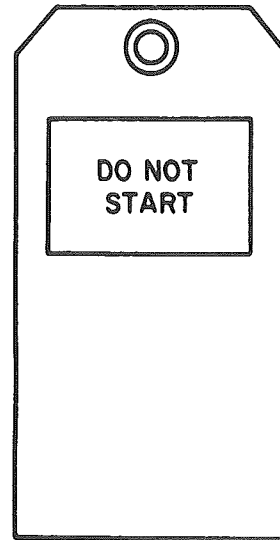
Symbols Used on Signs



Dimension	A	B	C	D	E	F	G	H
Units	1	3 1/2	4	6	11	15	21	30

Fig. J-9

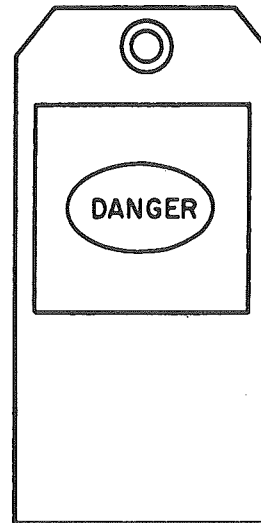
Symbol for Biological Hazard



**White tag
white letters on
red square**

Fig. J-10

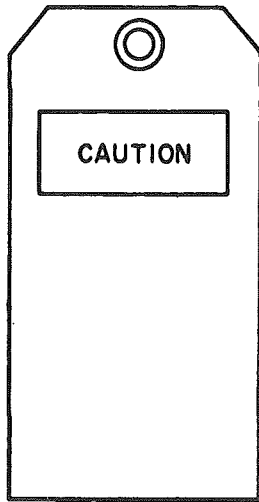
Do Not Start Tag



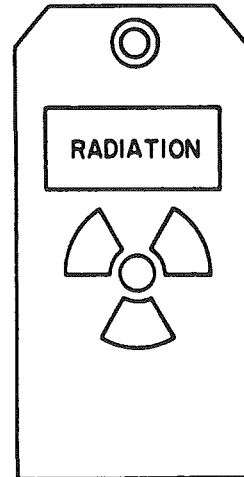
**White tag
white letters on
red oval with a
black square**

Fig. J-11

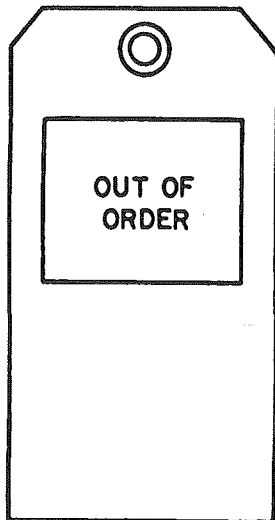
Danger Tag



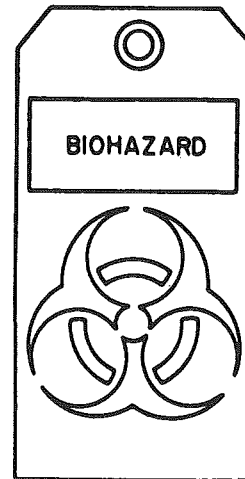
**Yellow tag
yellow letters on a
black background**
Fig. J-12
Caution Tag



**Yellow tag
yellow letters in
reddish-purple panel
(Added wording in black
on yellow background)**
Fig. J-14
Radiation Tag



**White tag
white letters on
black background**
Fig. J-13
Out of Order Tag



**White tag
black letters on
fluorescent-orange
background and
symbol**
Fig. J-15
Biological Hazard Tag

TABLE J-1

STANDARD PROPORTIONS FOR DANGER SIGNS

Sign size, inches Height Width	Black rectangular panel, inches		Red oval, inches		Word danger, height inches	Maximum space available for sign wording, inches
	Height	Width	Height	Width		
HORIZONTAL PATTERN						
7x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	2 3/4 x 9 3/8		
10x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	4 1/4 x 13 3/8		
14x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	6 1/4 x 19 3/8		
20x28	9 1/4 x 27 3/8	8 1/4 x 23 7/8	4 1/8	9 1/2 x 27 3/8		
UPRIGHT PATTERN						
10x 7	2 3/8 x 6 3/8	2 1/8 x 5 7/8	1 1/16	6 3/8 x 6 3/8		
14x10	3 1/4 x 9 3/8	2 7/8 x 8 1/2	1 7/16	9 1/2 x 9 3/8		
20x14	4 5/8 x 13 3/8	4 1/8 x 11 7/8	2 1/16	14 x 13 3/8		
28x20	6 1/2 x 19 3/8	5 3/4 x 17	2 7/8	20 1/4 x 19 3/8		

TABLE J-2

STANDARD PROPORTIONS FOR CAUTION SIGNS

Sign size, inches height width	Black rectangular panel, inches		Word "Caution" height of letter, inches	Maximum space available for sign wording below panel inches	
	height	width		height	width
HORIZONTAL PATTERN					
7 x 10	2 1/4 x 9 3/8	1 5/8	3 1/4 x 9 3/8		
10 x 14	3 1/4 x 13 3/8	2 1/4	5 1/2 x 13 3/8		
14 x 20	3 3/4 x 19 3/8	2 3/4	9 x 19 3/8		
20 x 28	4 1/4 x 27 3/8	3 1/4	14 1/2 x 27 3/8		
UPRIGHT PATTERN					
10 x 7	1 5/8 x 6 3/8	1 1/8	7 x 6 3/8		
14 x 10	2 1/4 x 9 3/8	1 5/8	10 1/2 x 9 3/8		
20 x 14	3 1/4 x 13 3/8	2 1/4	15 1/2 x 13 3/8		
28 x 20	3 3/4 x 19 3/8	2 3/4	24 x 19 3/8		

TABLE J-3

STANDARD PROPORTIONS FOR SAFETY INSTRUCTION SIGNS

[TABLE J-3: PART 1—"Think" Safety Sign]

Sign size, inches, height, width	Maximum			
	Green rectangular panel, inches, height, width	Word "Think" height letters, inches	Space available for sign wording below panel, inches height, width	
7x10	2 3/4x 9 3/8	1 5/8	3 1/2x 9 3/8	
10x14	3 1/4x13 3/8	2 1/4	5 1/2x13 3/8	
14x20	3 3/4x19 3/8	2 3/4	9 x19 3/8	
20x28	4 1/4x27 3/8	3 1/4	14 1/2x27 3/8	

[TABLE J-3: PART 2—"Be Careful" Safety Sign]

Sign size, inches, height, width	Maximum			
	Green panel, inches, height, width	Word "Be" height of letters, inches	Word "Careful" height of letters, inches	Space available for sign wording below panel, inches, height, width
7x10	3 3/8x 9 3/8	1 1/4	1 3/16	2 1/2x 9 3/8
10x14	4 1/4x13 3/8	1 3/4	2 3/16	4 x13 3/8
14x20	6 1/4x19 3/8	2 1/2	3 1/8	6 x19 3/8
20x28	9 1/2x27 3/8	3 1/2	4 3/8	9 1/4x27 3/8

TABLE J-4

STANDARD PROPORTIONS FOR DIRECTIONAL SIGNS

Sign size inches height	Black rectangular panel, inches height width	White arrow, inches			Maximum space for sign wording below panel height	
		Overall length	Arrow head height width	Arrow shaft height width		
6 1/2x14	3 1/4x 13 3/8	12 5/8	2 3/4x 3	1 1/8	2 3/8x 3 1/4	2 1/4x 13 3/8
9x20	4 1/2x 19 3/8	18 5/8	3 3/4x 4 1/8	1 5/8	3 1/4x 4 1/2	3 3/8x 19 3/8
12x28	6x 27 3/8	26 5/8	5 1/8x 5 5/8	2 1/8	4 3/8x 6	4 3/4x 27 3/8
15x36	7 1/2x 35 3/8	34 5/8	6 3/8x 6 7/8	2 5/8	5 1/2x 7 1/2	6 1/4x 35 3/8

[Order 76-6, § 296-24-14011, filed 3/1/76; Order 73-5, § 296-24-14011, filed 5/9/73 and Order 73-4, § 296-24-14011, filed 5/7/73.]

WAC 296-24-145 Window washing. [Order 73-5, § 296-24-145, filed 5/9/73 and Order 73-4, § 296-24-145, filed 5/7/73.]

WAC 296-24-14501 Definitions. (1) "Building" means a building more than one story in height or having window sills more than twelve (12) feet above grade, which is a place of employment.

(2) The term "outside" means wholly without the building and/or establishment.

(3) The term "window cleaning" means all methods of cleaning windows.

(4) The term "safety belt" means the equipment which is attached to the body of the window cleaner while cleaning windows.

(5) "Waist band" means that part of the safety belt which is attached to the body of the window cleaner.

(6) "Terminal strap" means the strap or rope which is attached to the waist band and to which the belt terminals are attached.

(7) A "safe manner" means the method employed in cleaning windows in which the employee is protected:

(a) By standing or sitting on the sill while protected by a safety device.

(b) By working from a ladder.

(c) By working from a scaffold, or

(d) By working from a boatswain's chair.

(8) "Belt terminal" means that part of the safety belt which is fastened to the terminal strap to be attached to the anchor during the operation of window cleaning.

(9) The term "anchor" means the fitting, fastened to the window frame or wall, to which the belt terminal is attached.

(10) The term "single-head anchor" means an anchor having one head.

(11) The term "double-head anchor" means an anchor having two heads.

(12) The term "machine bolt" means the bolts used to install anchors in steel window frames.

(13) "Grade" means the ground, the floor, the sidewalk, the roof, or any approximately level solid surface of sufficient area and having sufficient structural strength to be considered as a safe place to work. [Order 73-5, § 296-24-14501, filed 5/9/73 and Order 73-4, § 296-24-14501, filed 5/7/73.]

WAC 296-24-14503 Application. These orders shall apply to all window cleaning done in places of employment. [Order 73-5, § 296-24-14503, filed 5/9/73 and Order 73-4, § 296-24-14503, filed 5/7/73.]

WAC 296-24-14505 Protection of persons engaged at window cleaning. (1) The employer shall not require nor permit any window in such building to be cleaned from the outside unless means are provided to enable such work to be done in a safe manner as provided in these standards.

(2) All employees required to clean windows shall use safety devices as required herein. [Order 73-5, § 296-24-14505, filed 5/9/73 and Order 73-4, § 296-24-14505, filed 5/7/73.]

WAC 296-24-14507 General. (1) In every building hereafter erected, having windows so constructed that it is usual and/or practicable for a person to stand on the sill in order to clean said window, there shall be installed window cleaner's safety anchors approved by the American Standard Association.

(2) When an employee is sitting on the window sill with his legs inside the room, he shall wear a safety belt equipped with a safety line. One end of the line shall be tied to a radiator, or any other substantial anchorage inside the room, unless the window opening is equipped with anchors in which case he shall attach his safety belt to said anchors.

(3) No safety device shall be used in window cleaning operations until it has the approval of the American Standard Association.

(4) The use of lag screws is prohibited in new or replacement installations hereafter made.

(5) Window cleaners shall not pass from one window sill to another window sill on the outside of a building unless one terminal is connected at all times.

(6) No employee who has not been properly trained to handle such equipment shall be assigned to work on scaffolds or boatswains' chairs.

(7) All window cleaning safety devices hereafter approved shall bear identification marks to identify the approval of the American Standard Association. [Order 73-5, § 296-24-14507, filed 5/9/73 and Order 73-4, § 296-24-14507, filed 5/7/73.]

WAC 296-24-14509 Belt terminals, anchors and bolts. (1) All anchors and belt terminals shall be capable of withstanding the following tests:

(a) To withstand an impact test of an iron weight of thirty-two (32) pounds falling free a distance of four (4) feet and striking the head of the anchor without fracture.

(b) A drop test of three hundred fifty (350) pounds dead weight (not sand) falling a distance of four (4) feet without fracture. The connection between the weight and anchor being a standard safety belt or ropes or cables not over six (6) feet long.

(c) To withstand a tension pull of six (6) thousand pounds without fracture. This tension to be applied through a belt terminal and in the direction which the anchor must withstand in service when a man falls.

(2) All metals used in the manufacture of anchors and belt terminals shall have a minimum ultimate tensile strength of fifty-five thousand (55,000) pounds per square inch, with an elongation of at least twenty-five (25) percent in two (2) inches and shall have a corrosion resistance of sixty (60) per cent as compared to copper. The belt terminal may be excepted from the corrosive resistance and elongation requirements of this order if of material and design of obvious superiority.

(3) All anchors installed hereafter shall be double-headed. These heads to be so designed or spaced that it will be impossible to attach the belt terminal to a single head. The Division of Safety may approve a single-headed anchor upon sufficient tests and proofs. [Order 73-5, § 296-24-14509, filed 5/9/73 and Order 73-4, § 296-24-14509 filed 5/7/73.]

WAC 296-24-14511 Belts. (1) An approved safety belt of tanned leather, canvas or any other approved material shall be used when the operator is required to stand on the sill while cleaning the window. The safety belt shall be capable of withstanding a drop test of three hundred fifty (350) pounds dead weight (not sand) falling a distance of four (4) feet without failure, one terminal only being attached. The connection between the weight and the belt shall be the waist band of the belt.

(2) The safety belt shall be kept in repair.

(3) Window cleaners using a safety belt shall attach one belt terminal to anchor before stepping out onto the sill. During the operation of window cleaning, both belt terminals shall be attached to the anchors.

(4) The fittings on the waist band through which the terminal strap or rope passes shall be so constructed that it will be impossible for the safety terminals to pass through them.

(5) Metal thimbles shall be provided where ropes or straps are secured to eyes or rings.

(6) Suitable length terminal straps shall be provided for windows more than six feet (6') wide between mullions. [Order 73-5, § 296-24-14511, filed 5/9/73 and Order 73-4, § 296-24-14511, filed 5/7/73.]

WAC 296-24-14513 Anchor installations. (1) Locations: Anchors shall be attached to the side frames of the window or to the building at a point not less than forty-two inches (42") nor more than fifty-one inches (51") (approximately) above the window sill. Care shall be taken when screwing up anchor fastenings, to prevent producing excess stresses.

(2) Wood—Existing and New Buildings: When anchors are attached to wood construction, through bolts of not less than one-half inch (1/2") diameter, extending at least through the window frame with washers and nuts inside, shall be used as anchor fasteners. Means shall be provided to keep the nut from backing off.

Wall flanges shall be not less than one and one-quarter inches (1 1/4") in diameter, or equivalent area.

(3) Concrete—New Buildings: Anchors attached to concrete poured in place in buildings hereafter erected, shall be installed while the concrete is being placed. Such anchors shall extend not less than five inches (5") into the concrete and shall have a cross-sectional area of not less than one-quarter (1/4) of a square inch and shall be provided with a fluke at the end of the anchor not less than one inch (1") in length.

(4) Masonry—New Buildings: Anchors attached to masonry, other than concrete poured in place, in buildings hereafter erected, shall be installed while the wall is under construction and shall be shaped to build into the joints between masonry units. Such anchors shall be not less than eight and one-half inches (8 1/2") long and shall have a cross-sectional area of not less than one-quarter (1/4) of a square inch at all unexposed points and shall have a fluke or flukes having a holding surface of not less than one inch (1") in length that shall be firmly imbedded in the masonry.

(5) Masonry and Concrete—Existing Buildings: Anchors installed on buildings or masonry and concrete construction heretofore erected, shall be attached to the window frames as required in these Standards, or by other methods approved by the Division of Safety.

(6) Hollow Metal—Existing and New Buildings: Anchors shall be attached to hollow metal construction by one of the following methods:

(a) At least two nickel steel bolts not less than five-sixteenths of an inch (5/16") in diameter passing through the frame and a steel reinforcing plate five-sixteenths of an inch (5/16") thick and not less than six inches (6") long, placed on the inside of the frame and secured by means of nuts and lock washers. In cases where it is impracticable to provide nuts and lock washers, the reinforcing plate may be tapped to receive five-sixteenths inch (5/16") diameter bolts, and the bolts shall extend through the plate.

(b) Where the screw bolt is an integral part of the anchor, it shall be at least one-half inch (1/2") in diameter and shall be secured by means of a nut and lock

washer, or any other method approved by the Division of Safety.

(c) All anchors and anchor fastenings shall be provided with means to prevent them from turning, backing off or becoming loose.

(7) Solid Metal—Existing and New Buildings: Anchors shall be attached to solid metal construction by one of the following methods:

(a) At least two nickel steel bolts not less than five-sixteenths of an inch (5/16") in diameter passing through the frame, and secured by means of nuts and lock washers. In cases where it is impracticable to provide nuts and lock washers, the metal frame shall be reinforced with a five-sixteenths inch (5/16") thick plate and tapped to receive at least two (2) five-sixteenths inch (5/16") diameter nickel steel bolts, and the bolts shall extend through the reinforcing plate.

(b) Where the screw bolt is an integral part of the anchor, it shall be at least one-half inch (1/2") in diameter and shall be secured by means of a nut and lock washer, or any other method approved by the Division of Safety.

(c) All anchors and anchor fastenings shall be provided with means to prevent them from turning, backing off or becoming loose. [Order 73-5, § 296-24-14513, filed 5/9/73 and Order 73-4, § 296-24-14513, filed 5/7/73.]

WAC 296-24-14515 Reversible and pivot windows.

(1) When it is necessary to clean reversible and pivot windows either of which is prevented from properly operating by obstructions or by the design of said windows, they shall be provided with safety devices of approved design.

(2) Horizontally pivoted sash. Provision shall be made so that the outside of horizontally pivoted windows may be cleaned without necessitating the window washer leaning against or putting his weight on the sash. [Order 73-5, § 296-24-14515, filed 5/9/73 and Order 73-4, § 296-24-14515, filed 5/7/73.]

WAC 296-24-14517 Ladders. (1) All movable ladders shall be provided with rough surface feet or other suitable means to prevent slipping.

(2) A person shall be placed at the foot of all ladders over eighteen (18) feet in length.

(3) No person shall be required to stand within four (4) rungs of the top of any ladder.

(4) No ladder shall be used where the base of the ladder is above grade except where it is securely fastened so as to prevent it from slipping or falling. [Order 73-5, § 296-24-14517, filed 5/9/73 and Order 73-4, § 296-24-14517, filed 5/7/73.]

WAC 296-24-14519 Boatswain's chairs. An employee shall be secured in his boatswain's chair with a safety belt or rope, and shall have a short rope with a sliding hitch between his body or the chair and the hoistline. [Order 73-5, § 296-24-14519, filed 5/9/73 and Order 73-4, § 296-24-14519, filed 5/7/73.]

Part C

MACHINERY AND MACHINE GUARDING

WAC

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WAC 296-24-150 Machinery and machine guarding—General requirements for all machines. Scope and application. All sections of this chapter which include WAC 296-24-150 in the section number apply to Machinery and Machine Guarding. [Order 74-27, § 296-24-150, filed 5/7/74; Order 73-5, § 296-24-150, filed 5/9/73 and Order 73-4, § 296-24-150, filed 5/7/73.]

WAC 296-24-15001 Machine guarding. (1) Types of Guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are—barrier guards, two-hand tripping devices, electronic safety devices, etc.

(2) General Requirements for Machine Guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

(3) Point of Operation Guarding. (a) Point of operation is the area on a machine where work is actually performed upon the material being processed.

(b) The point of operation of machines whose operation exposes an employee to injury, shall be guarded.

The guarding device shall be in conformity with any appropriate standards therefor, or, in the absence of applicable specific standards, shall be so designed and constructed as to prevent the operator from having any part of his body in the danger zone during the operating cycle.

(c) Special handtools for placing and removing material shall be such as to permit easy handling of material without the operator placing a hand in the danger zone. Such tools shall not be in lieu of other guarding required by this section, but can only be used to supplement protection provided.

(d) The following are some of the machines which usually require point of operation guarding.

- (i) Guillotine cutters.
- (ii) Shears.
- (iii) Alligator shears.
- (iv) Power presses.
- (v) Milling machines.
- (vi) Power saws.
- (vii) Jointers.
- (viii) Portable power tools.
- (ix) Forming rolls and calenders.

(4) Barrels, Containers, and Drums. Revolving drums, barrels, and containers shall be guarded by an enclosure which is interlocked with the drive mechanism, so that the barrel, drum, or container cannot revolve unless the guard enclosure is in place.

(5) Exposure of Blades. When the periphery of the blades of a fan is less than seven (7) feet above the floor or working level, the blades shall be guarded. The guard shall have openings no larger than one-half (1/2) inch. Safeguards shall be so constructed that rods, pipes, or like material being handled by workmen will not enter same, and come in contact with moving machinery.

(6) Cams and other machine parts which move in such a manner as to create shearing or crushing hazards shall, if exposed to contact, be guarded with a standard safeguard. [Order 74-27, § 296-24-15001, filed 5/7/74; Order 73-5, § 296-24-15001, filed 5/9/73 and Order 73-4, § 296-24-15001, filed 5/7/73.]

WAC 296-24-15003 Anchoring fixed machinery. Machines designed for a fixed location shall be securely anchored to prevent walking or moving. [Order 73-5, § 296-24-15003, filed 5/9/73 and Order 73-4, § 296-24-15003, filed 5/7/73.]

WAC 296-24-15005 Means to prevent slipping. Operators of dangerous machinery, such as shapers, jointers, and circular saws, shall be safeguarded against slipping on smooth, oily or otherwise slippery floor, where he stands while at the point of operation of such dangerous machinery, by covering such portion of the floor with a rubber mat, cork, non-slip composition flooring, or some other effective means of preventing slipping. [Order 73-5, § 296-24-15005, filed 5/9/73 and Order 73-4, § 296-24-15005, filed 5/7/73.]

WAC 296-24-15007 Machines shall be stopped when making repairs. 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 adjustment. [Order 74-27, § 296-24-15007, filed 5/7/74.]

WAC 296-24-15009 Counterweights. All counterweights exposed to contact shall be guarded with standard safeguards. [Order 74-27, § 296-24-15009, filed 5/7/74.]

WAC 296-24-165 Fixed and portable power tool requirements. [Order 76-6, § 296-24-165, filed 3/1/76; Order 73-5, § 296-24-165, filed 5/9/73 and Order 73-4, § 296-24-165, filed 5/7/73.]

WAC 296-24-16501 Definitions. (1) "Point of operations" means that point at which cutting, shaping, boring, or forming is accomplished upon the stock.

(2) "Push stick" means a narrow strip of wood or other soft material with a notch cut into one end and which is used to push short pieces of material through saws.

(3) "Block" means a short block of wood, provided with a handle similar to that of a plane and a shoulder at the rear end, which is used for pushing short stock over revolving cutters. [Order 73-5, § 296-24-16501, filed 5/9/73 and Order 73-4, § 296-24-16501, filed 5/7/73.]

WAC 296-24-16503 Machine construction general. (1) Each machine shall be so constructed as to be free from sensible vibration when the largest size tool is mounted and run idle at full speed.

(2) Arbors and mandrels shall be constructed so as to have firm and secure bearing and be free from play.

(3) The use of wooden bandsaw wheels other than those of commercial manufacture is prohibited.

(4) Any automatic cutoff saw that strokes continuously without the operator being able to control each stroke shall not be used.

(5) Saw frames or tables shall be constructed with lugs cast on the frame or with an equivalent means to limit the size of the saw blade that can be mounted, so as to avoid overspeed caused by mounting a saw larger than intended.

(6) Circular saw fences shall be so constructed that they can be firmly secured to the table or table assembly without changing their alignment with the saw. For saws with tilting tables or tilting arbors the fence shall be so constructed that it will remain in a line parallel with the saw, regardless of the angle of the saw with the table.

(7) Circular saw gages shall be so constructed as to slide in grooves or tracks that are accurately machined, to insure exact alignment with the saw for all positions of the guide.

(8) Hinged saw tables shall be so constructed that the table can be firmly secured in any position and in true alignment with the saw.

(9) All belts, pulleys, gears, shafts, and moving parts shall be guarded in accordance with the specific requirements of WAC 296-24-20501 through WAC 296-24-20533.

(10) It is recommended that each power-driven woodworking machine be provided with a disconnect switch that can be locked in the off position.

(11) The frames and all exposed, noncurrent-carrying metal parts of portable electric woodworking machinery operated at more than 90 volts to ground shall be grounded and 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.

(12) For all circular saws where conditions are such that there is a possibility of contact with the portion of the saw either beneath or behind the table, that portion of the saw shall be covered with an exhaust hood, or, if no exhaust system is required, with a guard that shall be so arranged as to prevent accidental contact with the saw.

(13) Revolving double arbor saws shall be fully guarded in accordance with all the requirements for circular crosscut saws or with all the requirements for circular ripsaws, according to the kind of saws mounted on the arbors.

(14) No saw, cutter head, or tool collar shall be placed or mounted on a machine arbor unless the tool has been accurately machined to size and shape to fit the arbor.

(15) Combs (featherboards) or suitable jigs shall be provided at the workplace for use when a standard guard cannot be used, as in dadoing, grooving, jointing, moulding and rabbeting. [Order 73-5, § 296-24-16503, filed 5/9/73 and Order 73-4, § 296-24-16503, filed 5/7/73.]

WAC 296-24-16505 Machine controls and equipment. (1) A mechanical or electrical power control shall be provided on each machine to make it possible for the operator to cut off the power from each machine without leaving his position at the point of operation.

(2) On machines driven by belts and shafting, a locking-type belt shifter or an equivalent positive device shall be used.

(3) On applications 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.

(4) Power controls and operating controls should be located within easy reach of the operator while he is at his regular work location, making it unnecessary for him to reach over the cutter to make adjustments. This does not apply to constant pressure controls used only for set-up purposes.

(5) 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.

(6) Each operating treadle shall be protected against unexpected or accidental tripping.

(7) Feeder attachments shall have the feed rolls or other moving parts so covered or guarded as to protect the operator from hazardous points. [Order 73-5, §

296-24-16505, filed 5/9/73 and Order 73-4, § 296-24-16505, filed 5/7/73.]

WAC 296-24-16507 Hand-fed ripsaws. (1) Each circular hand-fed ripsaw shall be guarded by a hood which shall completely enclose that portion of the saw above the table and that portion of the saw above the material being cut. The hood and mounting shall be arranged so that the hood will automatically adjust itself to the thickness of and remain in contact with the material being cut but it shall not offer any considerable resistance to insertion of material to saw or to passage of the material being sawed. The hood shall be made of adequate strength to resist blows and strains incidental to reasonable operation, adjusting, and handling, and shall be so designed as to protect the operator from flying splinters and broken saw teeth. It shall be made of material that is soft enough so that it will be unlikely to cause tooth breakage. The material should not shatter when broken, should be nonexplosive, and should be no more flammable than wood. The hood shall be so mounted as to insure that its operation will be positive, reliable, and in true alignment with the saw; and the mounting shall be adequate in strength to resist any reasonable side thrust or other force tending to throw it out of line.

(2) Each hand-fed circular ripsaw shall be furnished with a spreader to prevent material from squeezing the saw or being thrown back on the operator. The spreader shall be made of hard tempered steel, or its equivalent, and shall be 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 saw 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 saw when the largest saw is mounted in the machine. 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.

(3) Each hand-fed circular ripsaw shall be provided with nonkickback fingers or dogs so located as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thicknesses of materials being cut. [Order 73-5, § 296-24-16507, filed 5/9/73 and Order 73-4, § 296-24-16507, filed 5/7/73.]

WAC 296-24-16509 Hand-fed crosscut table saws. (1) Each circular crosscut table saw shall be guarded by a hood which shall meet all the requirements of WAC 296-24-16507(1) for hoods for circular ripsaws.

(2) Each circular crosscut saw should also be provided with a spreader which should meet all the requirements of WAC 296-24-16507. [Order 73-5, § 296-24-16509, filed 5/9/73 and Order 73-4, § 296-24-16509, filed 5/7/73.]

WAC 296-24-16511 Circular resaws. (1) Each circular resaw shall be guarded by a hood or shield of metal above the saw. This hood or shield shall be so designed as to guard against danger from flying splinters or broken saw teeth.

(2) Each circular resaw (other than self-feed saws with a roller or wheel at back of the saw) shall be provided with a spreader fastened securely behind the saw. The spreader shall be slightly thinner than the saw kerf and slightly thicker than the saw disk. [Order 73-5, § 296-24-16511, filed 5/9/73 and Order 73-4, § 296-24-16511, filed 5/7/73.]

WAC 296-24-16513 Self-feed circular saws. (1) Feed rolls and saws shall be protected by a hood or guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard shall be constructed of heavy material, preferably metal, and the bottom of the guard shall come down to within three-eighths inch of the plane formed by the bottom or working surfaces of the feed rolls. This distance (three-eighths inch) may be increased to three-fourths inch, provided the lead edge of the hood is extended to be not less than 5 1/2 inches in front of the nip point between the front roll and the work.

(2) Each self-feed circular rip saw shall be provided with sectional nonkickback fingers for the full width of the feed rolls. They shall be located in front of the saw and so arranged as to be in continual contact with the wood being fed. [Order 73-5, § 296-24-16513, filed 5/9/73 and Order 73-4, § 296-24-16513, filed 5/7/73.]

WAC 296-24-16515 Swing cutoff saws. The requirements of this section are also applicable to sliding cutoff saws mounted above the table.

(1) Each swing cutoff saw shall be provided with a hood that will completely enclose the upper half of the saw, the arbor end, and the point of operation at all positions of the saw. The hood shall be constructed in such a manner and of such material that it will protect the operator from flying splinters and broken saw teeth. Its hood shall be so designed that it will automatically cover the lower portion of the blade, so that when the saw is returned to the back of the table the hood will rise on top of the fence, and when the saw is moved forward the hood will drop on top of and remain in contact with the table or material being cut.

(2) Each swing cutoff saw shall be provided with an effective device to return the saw automatically to the back of the table when released at any point of its travel. Such a device shall not depend for its proper functioning upon any rope, cord, or spring. If there is a counterweight, the bolts supporting the bar and counterweight shall be provided with cotter pins; and the counterweight shall be prevented from dropping by either a bolt passing through both the bar and counterweight, or a bolt put through the extreme end of the bar, or, where the counterweight does not encircle the bar, a safety chain attached to it.

(3) Limit chains or other equally effective devices shall be provided to prevent the saw from swinging beyond the front or back edges of the table, or beyond a forward position where the gullets of the lowest saw teeth will rise above the table top.

(4) Inverted swing cutoff saws shall be provided with a hood that will cover the part of the saw that protrudes above the top of the table or above the material being cut. It shall automatically adjust itself to the thickness of and remain in contact with the material being cut. [Order 73-5, § 296-24-16515, filed 5/9/73 and Order 73-4, § 296-24-16515, filed 5/7/73.]

WAC 296-24-16517 Radial saws. (1) The upper hood shall completely enclose the upper portion of the blade down to a point that will include the end of the saw arbor. The upper hood shall be constructed in such a manner and of such material that it will protect the operator from flying splinters, broken saw teeth, etc., and will deflect sawdust away from the operator. The sides of the lower exposed portion of the blade shall be guarded to the full diameter of the blade by a device that will automatically adjust itself to the thickness of the stock and remain in contact with stock being cut to give maximum protection possible for the operation being performed.

(2) Each radial saw used for ripping shall be provided with nonkickback fingers or dogs located on both sides of the saw so as to oppose the thrust or tendency of the saw to pick up the material or to throw it back toward the operator. They shall be designed to provide adequate holding power for all the thickness of material being cut.

(3) An adjustable stop shall be provided to prevent the forward travel of the blade beyond the position necessary to complete the cut in repetitive operations.

(4) Installation shall be in such a manner that the front end of the unit will be slightly higher than the rear, so as to cause the cutting head to return gently to the starting position when released by the operator.

(5) Ripping and ploughing shall be against the direction in which the saw turns. The direction of the saw rotation shall be conspicuously marked on the hood. In addition, a permanent label not less than 1 1/2 inches by 3/4 inch shall be affixed to the rear of the guard at approximately the level of the arbor, reading as follows: "Danger: Do Not Rip or Plough From This End". Such a label should be colored standard danger red. [Order 73-5, § 296-24-16517, filed 5/9/73 and Order 73-4, § 296-24-16517, filed 5/7/73.]

WAC 296-24-16519 Bandsaws and band resaws.

(1) All portions of the saw blade shall be enclosed or guarded, except for the working portion of the blade between the bottom of the guide rolls and the table. Bandsaw wheels shall be fully encased. The outside periphery of the enclosure shall be solid. The front and back of the band wheels shall be either enclosed by solid material or by wire mesh or perforated metal. Such mesh or perforated metal shall be not less than 0.037 inch (U.S. Gage No. 20), and the openings shall be not greater than three-eighths inch. Solid material used for this purpose shall be of an equivalent strength and firmness. The

guard for the portion of the blade between the sliding guide and the upper-saw-wheel guard shall protect the saw blade at the front and outer side. This portion of the guard shall be self-adjusting to raise and lower with the guide. The upper-wheel guard shall be made to conform to the travel of the saw on the wheel, and the top member of the guard should have at least a 2-inch clearance outside the saw and be lined with smooth material, preferably metal. Effective brakes should be provided to stop the wheel in case of blade breakage.

(2) Each bandsaw machine shall be provided with a tension control device to indicate a proper tension for the standard saws used on the machine, in order to assist in the elimination of saw breakage due to improper tension.

(3) Feed rolls of band resaws shall be protected with a suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard shall be constructed of heavy material, preferably metal, and the edge of the guard shall come to within three-eighths inch of the plane formed by the inside face of the feed roll in contact with the stock being cut. [Order 73-5, § 296-24-16519, filed 5/9/73 and Order 73-4, § 296-24-16519, filed 5/7/73.]

WAC 296-24-16521 Jointers. (1) Each hand-fed planer and jointer with horizontal head shall be equipped with a cylindrical cutting head, the knife projection of which shall not exceed one-eighth inch beyond the cylindrical body of the head.

(2) The opening in the table shall be kept as small as possible. The clearance between the edge of the rear table and the cutter head shall be not more than one-eighth inch. The table throat opening shall be not more than 2 1/2 inches when tables are set or aligned with each other for zero cut.

(3) Each hand-fed jointer with a horizontal cutting head shall have an automatic guard which will cover all the section of the head on the working side of the fence or gage. The guard shall effectively keep the operator's hand from coming in contact with the revolving knives. The guard shall automatically adjust itself to cover the unused portion of the head and shall remain in contact with the material at all times.

(4) Each hand-fed jointer with horizontal cutting head shall have a guard which will cover the section of the head back of the gage or fence.

(5) Each wood jointer with vertical head shall have either an exhaust hood or other guard so arranged as to enclose completely the revolving head, except for a slot of such width as may be necessary and convenient for the application of the material to be jointed. [Order 73-5, § 296-24-16521, filed 5/9/73 and Order 73-4, § 296-24-16521, filed 5/7/73.]

WAC 296-24-16523 Tenoning machines. (1) Feed chains and sprockets of all double end tenoning machines shall be completely enclosed, except for that portion of chain used for conveying the stock.

(2) At the rear ends of frames over which feed conveyors run, sprockets and chains shall be guarded at the sides by plates projecting beyond the periphery of sprockets and the ends of lugs.

(3) Each tenoning machine shall have all cutting heads, and saws if used, covered by metal guards. These guards shall cover at least the unused part of the periphery of the cutting head. If such a guard is constructed of sheet metal, the material used shall be not less than one-sixteenth inch in thickness, and if cast iron is used, it shall be not less than three-sixteenths inch in thickness.

(4) Where an exhaust system is used, the guard shall form part or all of the exhaust hood and shall be constructed of metal of a thickness not less than that specified in subdivision (3) of this subsection. [Order 76-6, § 296-24-16523, filed 3/1/76; Order 73-5, § 296-24-16523, filed 5/9/73 and Order 73-4, § 296-24-16523, filed 5/7/73.]

WAC 296-24-16525 Boring and mortising machines. (1) Safety-bit chucks with no projecting set screws shall be used.

(2) Boring bits should be provided with a guard that will enclose all portions of the bit and chuck above the material being worked.

(3) The top of the cutting chain and driving mechanism shall be enclosed.

(4) If there is a counterweight, one of the following or equivalent means shall be used to prevent its dropping:

(a) It shall be bolted to the bar by means of a bolt passing through both bar and counterweight;

(b) A bolt shall be put through the extreme end of the bar;

(c) Where the counterweight does not encircle the bar, a safety chain shall be attached to it;

(d) Other types of counterweights shall be suspended by chain or wire rope and shall travel in a pipe or other suitable enclosure wherever they might fall and cause injury.

(5) Universal joints on spindles of boring machines shall be completely enclosed in such a way as to prevent accidental contact by the operator.

(6) Each operating treadle shall be covered by an inverted U-shaped metal guard, fastened to the floor, and of adequate size to prevent accidental tripping. [Order 73-5, § 296-24-16525, filed 5/9/73 and Order 73-4, § 296-24-16525, filed 5/7/73.]

WAC 296-24-16527 Wood shapers and similar equipment. (1) The cutting heads of each wood shaper, hand-fed panel raiser, or other similar machine not automatically fed, shall be enclosed with a cage or adjustable guard so designed as to keep the operator's hand away from the cutting edge. The diameter of circular shaper guards shall be not less than the greatest diameter of the cutter. In no case shall a warning device of leather or other material attached to the spindle be acceptable.

(2) Cylindrical heads should be used whenever the nature of the work will permit. Single cutter knives in shaper heads shall not be used unless properly balanced.

(3) All double-spindle shapers shall be provided with a spindle starting and stopping device for each spindle. [Order 73-5, § 296-24-16527, filed 5/9/73 and Order 73-4, § 296-24-16527, filed 5/7/73.]

WAC 296-24-16529 Planing, molding, sticking, and matching machines. (1) Each planing, molding, sticking, and matching machine shall have all cutting heads, and saws if used, covered by a metal guard. If such guard is constructed of sheet metal, the material used shall be not less than 1/16 inch in thickness, and if cast iron is used, it shall be not less than three-sixteenths inch in thickness.

(2) Where an exhaust system is used, the guards shall form part or all of the exhaust hood and shall be constructed of metal of a thickness not less than that specified in (1) of this section.

(3) Feed rolls shall be guarded by a hood or suitable guard to prevent the hands of the operator from coming in contact with the in-running rolls at any point. The guard shall be fastened to the frame carrying the rolls so as to remain in adjustment for any thickness of stock.

(4) Surfacers or planers used in thicknessing multiple pieces of material simultaneously shall be provided with sectional infeed rolls having sufficient yield in the construction of the sections to provide feeding contact pressure on the stock, over the permissible range of variation in stock thickness specified or for which the machine is designed. In lieu of such yielding sectional rolls, suitable section kickback finger devices shall be provided at the infeed end. [Order 73-5, § 296-24-16529, filed 5/9/73 and Order 73-4, § 296-24-16529, filed 5/7/73.]

WAC 296-24-16531 Profile and swing-head lathes and wood heel turning machine. (1) Each profile and swing-head lathe shall have all cutting heads covered by a metal guard. If such a guard is constructed of sheet metal, the material used shall be not less than one-sixteenth inch in thickness; and if cast iron is used, it shall not be less than three-sixteenths inch in thickness.

(2) Cutting heads on wood-turning lathes, whether rotating or not, shall be covered as completely as possible by hoods or shields, which should be hinged to the machines so that they can be thrown back for making adjustments.

(3) Shoe last and spoke lathes, doweling machines, wood heel turning machines, and other automatic wood-turning lathes of the rotating knife type shall be equipped with hoods enclosing the cutter blades completely except at the contact points while the stock is being cut.

(4) Lathes used for turning long pieces of wood stock held only between the two centers shall be equipped with long curved guards extending over the tops of the lathes in order to prevent the work pieces from being thrown out of the machines if they should become loose.

(5) Where an exhaust system is used, the guard shall form part or all of the exhaust hood and shall be constructed of metal of a thickness not less than that specified in (1) of this section. [Order 73-5, § 296-24-16531, filed 5/9/73 and Order 73-4, § 296-24-16531, filed 5/7/73.]

WAC 296-24-16533 Sanding machines. (1) Feed rolls of self-feed sanding machines shall be protected with a semicylindrical guard to prevent the hands of the operator from coming in contact with the in-running

rolls at any point. The guard shall be constructed of heavy material, preferably metal, and firmly secured to the frame carrying rolls so as to remain in adjustment for any thickness of stock. The bottom of the guard should come down to within three-eighths inch of a plane formed by the bottom or contact face of the feed roll where it touches the stock.

(2) Each drum sanding machine shall have an exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving drum, except for that portion of the drum above the table, if a table is used, which may be necessary and convenient for the application of the material to be finished.

(3) Each disk sanding machine shall have the exhaust hood, or other guard if no exhaust system is required, so arranged as to enclose the revolving disk, except for that portion of the disk above the table, if a table is used, which may be necessary for the application of the material to be finished.

(4) Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs on to a pulley. These guards shall effectively prevent the hands or fingers of the operator from coming in contact with the nip points. The unused run of the sanding belt shall be guarded against accidental contact. [Order 73-5, § 296-24-16533, filed 5/9/73 and Order 73-4, § 296-24-16533, filed 5/7/73.]

WAC 296-24-16535 Veneer cutters and wringers.

(1) Veneer slicer knives shall be guarded to prevent accidental contact with knife edge, at both front and rear.

(2) Veneer clippers shall have automatic feed or shall be provided with a guard which will make it impossible to place a finger or fingers under the knife while feeding or removing the stock.

(3) Sprockets on chain or slat-belt conveyors shall be enclosed.

(4) Where practicable, hand and foot-power guillotine veneer cutters shall be provided with rods or plates or other satisfactory means, so arranged on the feeding side that the hands cannot reach the cutting edge of the knife while feeding or holding the stock in place.

(5) Power-driven guillotine veneer cutters, except continuous feed trimmers, shall be equipped with:

(a) Starting devices which require the simultaneous action of both hands to start the cutting motion and of at least one hand on a control during the complete stroke of the knife; or

(b) An automatic guard which will remove the hands of the operator from the danger zone at every descent of the blade, used in conjunction with one-hand starting devices which require two distinct movements of the device to start the cutting motion, and so designed as to return positively to the nonstarting position after each complete cycle of the knife.

(6) Where two or more workers are employed at the same time on the same power-driven guillotine veneer cutter equipped with two-hand control, the device shall be so arranged that each worker shall be required to use both hands simultaneously on the controls to start the cutting motion, and at least one hand on a control to complete the cut.

(7) Power-driven guillotine veneer cutters, other than continuous trimmers, shall be provided, in addition to the brake or other stopping mechanism, with an emergency device which will prevent the machine from operating in the event of failure of the brake when the starting mechanism is in the non-starting position. [Order 73-5, § 296-24-16535, filed 5/9/73 and Order 73-4, § 296-24-16535, filed 5/7/73.]

WAC 296-24-16537 Miscellaneous woodworking machines. (1) The feed rolls of roll type glue spreaders shall be guarded by a semicylindrical guard. The bottom of the guard shall come to within three-eighths inch of a plane formed by bottom or contact face of the feed roll where it touches the stock.

(2) Drag saws shall be so located as to give at least a 4-foot clearance for passage when the saw is at the extreme end of the stroke; or if such clearance is not obtainable, the saw and its driving mechanism shall be provided with a standard enclosure.

(3) For combination or universal woodworking machines each point of operation of any tool shall be guarded as required for such a tool in a separate machine.

(4) The mention of specific machines in WAC 296-24-16503 through WAC 296-24-16535, inclusive, is not intended to exclude other woodworking machines from the requirement that suitable guards and exhaust hoods be provided to reduce to a minimum the hazard due to the point of operation of such machines. [Order 73-5, § 296-24-16537, filed 5/9/73 and Order 73-4, § 296-24-16537, filed 5/7/73.]

WAC 296-24-16539 Inspection and maintenance of woodworking machinery. (1) Dull, badly set, improperly filed, or improperly tensioned saws shall be immediately removed from service, before they begin to cause the material to stick, jam, or kick back when it is fed to the saw at normal speed. Saws to which gum has adhered on the sides shall be immediately cleaned.

(2) All knives and cutting heads of woodworking machines shall be kept sharp, properly adjusted, and firmly secured. Where two or more knives are used in one head, they shall be properly balanced.

(3) Bearings shall be kept free from lost motion and shall be well lubricated.

(4) Arbors of all circular saws shall be free from play.

(5) Sharpening or tensioning of saw blades or cutters shall be done only by persons of demonstrated skill in this kind of work.

(6) Emphasis is placed upon the importance of maintaining cleanliness around woodworking machinery, particularly as regards the effective functioning of guards and the prevention of fire hazards in switch enclosures, bearings, and motors.

(7) All cracked saws shall be removed from service.

(8) The practice of inserting wedges between the saw disk and the collar to form what is commonly known as a "wobble saw" shall not be permitted.

(9) Push sticks or push blocks shall be provided at the work place in the several sizes and types suitable for the work to be done.

(10) Twists or kinks in bandsaws and band resaws shall be promptly removed with a hammer.

(11) To avoid vibration, brazed joints in bandsaws and band resaws shall be the same thickness as the saw blade.

(12) The knife blade of jointers shall be so installed and adjusted that it does not protrude more than one-eighth inch beyond the cylindrical body of the head. Push sticks or push blocks shall be provided at the work place in the several sizes and types suitable for the work to be done.

(13) Whenever veneer slicers or rotary veneer-cutting-machines have been shutdown for the purpose of inserting logs or to make adjustments, operators shall make sure that machine is clear and other workmen are not in a hazardous position before starting the machine.

(14) Operators shall not ride the carriage of a veneer slicer. [Order 73-5, § 296-24-16539, filed 5/9/73 and Order 73-4, § 296-24-16539, filed 5/7/73.]

WAC 296-24-170 Cooperage machinery. [Order 73-5, § 296-24-170, filed 5/9/73 and Order 73-4, § 296-24-170, filed 5/7/73.]

WAC 296-24-17001 Definitions. (1) "Point of operation" means that point at which cutting, shaping, boring, or forming is accomplished upon the stock.

(2) "Push stick" means a narrow strip of wood or other soft material with a notch cut into one end and which is used to push short pieces of material through saws.

(3) "Block" means a short block of wood, provided with a handle similar to that of a plane and a shoulder at the rear end, which is used for pushing short stock over revolving cutters. [Order 73-5, § 296-24-17001, filed 5/9/73 and Order 73-4, § 296-24-17001, filed 5/7/73.]

WAC 296-24-17003 Heading bolt sawing machine.

(1) Each heading saw shall be guarded by a hood curved to the contour of the saw. The hood shall cover the saw at least to the depth of the teeth, except for that portion actually used in making the cut. The exhaust hood shall be so arranged and maintained as to guard effectively the bottom portion of the saw. The hood shall be made of adequate strength to resist strains incidental to reasonable operation.

(2) The balance wheel shall be covered to enclose the rim and outside portion of the wheel. Expanded metal curved to fit the contour of the wheel is recommended.

(3) The swing carriage shall be provided with an effective device that will return the carriage automatically to a position in front of the saw. Such a device shall not depend entirely upon any rope, cord, or spring for its proper functioning. If a counterweight is used, a safety chain shall be attached to it to prevent dropping, should the bar break or the weight become disengaged. All bolts supporting the bar, weight, and chain shall be provided with cotter pins or equally effective devices. A bolt shall be put through the extreme end of the counterweight bar to prevent dropping of the weight.

(4) A limit stop shall be provided to prevent the carriage from swinging too far back and thereby exposing the unguarded portion of the saw to contact. [Order 73-5, § 296-24-17003, filed 5/9/73 and Order 73-4, § 296-24-17003, filed 5/7/73.]

WAC 296-24-17005 Bolt, equalizer, stave, and heading saws (tilting table style). (1) All heading and stave bolt equalizer saws shall be guarded by hoods, curved to the contour of all the saws. The hood shall cover the saw at least to the depth of the teeth, except for that portion actually used in making the cut. The exhaust hood shall be so arranged and maintained as to guard effectively the bottom portion of the saws.

(2) Hoods shall be attached to each end of the tilting table and shall extend forward to cover the portion of the saws which cannot be enclosed by a stationary guard.

(3) A limit stop shall be provided to prevent the table from coming too far back and thereby exposing the unguarded portion of the saws to contact. [Order 73-5, § 296-24-17005, filed 5/9/73 and Order 73-4, § 296-24-17005, filed 5/7/73.]

WAC 296-24-17007 Barrel stave saws (cylindrical saws). (1) Each machine of this type shall have the saw and the revolving part (head) to which the saw blade is bolted enclosed with a hinged guard to prevent accidental contact, except for that part of the saw immediately adjacent to the carriage, which is the point of operation of the saw.

(2) The exhaust hood shall be so arranged and maintained as to guard effectively the bottom portion of the saw. The hood shall be made of adequate strength to resist strains incidental to reasonable operation. [Order 73-5, § 296-24-17007, filed 5/9/73 and Order 73-4, § 296-24-17007, filed 5/7/73.]

WAC 296-24-17009 Hand-fed ripsaws. (1) Each circular hand-fed ripsaw shall be guarded with a hood. The hood shall be stationary and cover the saw to a distance of approximately three-fourths inch above the stave being ripped. This will prevent the material being cut from being raised by upward centrifugal force of the saw in cases of pinching or binding before the stave reaches the splitter. The hood shall provide inside clearance between the top edge of saw and guard to allow an accidental blow to strike it to the table and not engage the teeth with the guard. The hood shall be constructed of heavy material, preferably metal. That portion of the saw remaining below the table shall be completely enclosed in an exhaust hood.

(2) Spreader requirements for this equipment are contained in WAC 296-24-16507(2). [Order 73-5, § 296-24-17009, filed 5/9/73 and Order 73-4, § 296-24-17009, filed 5/7/73.]

WAC 296-24-17011 Self-feed stave and heading equalizer saws. (1) Self-feed equalizer saws shall be guarded with a hood guard which will cover the top and

sides of the saws. The hood should adjust itself automatically to the thickness of, and remain in contact with, the material being cut.

(2) The portion of the saw blade extending beneath the mandrel shall be enclosed in an exhaust hood and be easily accessible for changing saws. [Order 73-5, § 296-24-17011, filed 5/9/73 and Order 73-4, § 296-24-17011, filed 5/7/73.]

WAC 296-24-17013 Stave and heading planers (single and double heads). (1) The exhaust hood, or other guards, if no exhaust system is required, shall be so arranged and maintained as to guard effectively all cutting heads and knives of single and double planers.

(2) Feed rolls, except for such portion as may be necessary to admit stock, shall be completely enclosed.

(3) Pressure bars or holddown arrangements shall be properly adjusted to assure correct pressure and clearance at all times. [Order 73-5, § 296-24-17013, filed 5/9/73 and Order 73-4, § 296-24-17013, filed 5/7/73.]

WAC 296-24-17015 Stave jointing machines (wheel). (1) Stave jointer wheels shall be covered on both sides with a removable metal hood connected to the exhaust system, except for that portion where the stock is applied to the knives.

(2) A limit stop should be installed on the frame to prevent any part of the carriage from coming in contact with any moving part of the wheel.

(3) The equipment described in (1) and (2) of this section include double independent stave jointer wheels, double jointer stave wheels, single jointer stave wheels, and all kinds of keg stave jointer wheels. [Order 73-5, § 296-24-17015, filed 5/9/73 and Order 73-4, § 296-24-17015, filed 5/7/73.]

WAC 296-24-17017 Heading jointer and doweler machine (wheel). (1) Each heading jointer shall be equipped with a removable guard covering the upper half of the wheel, except for that portion where the stock is applied to the knives.

(2) The lower portion of the wheel shall be guarded with sheet metal or expanded metal to prevent accidental contact with the knives. [Order 73-5, § 296-24-17017, filed 5/9/73 and Order 73-4, § 296-24-17017, filed 5/7/73.]

WAC 296-24-17019 Heading rounder. The cutter head shall be enclosed in a hood attached to the exhaust system, arranged and maintained in such a manner as to guard effectively the entire cutting mechanism, except for that portion of the cutting head where the stock is applied. [Order 73-5, § 296-24-17019, filed 5/9/73 and Order 73-4, § 296-24-17019, filed 5/7/73.]

WAC 296-24-17021 Power windlass machine. Windlass machines having counterweights shall operate with the weights in a stationary casing. On all machines having a friction gear, the gear shall be properly guarded. [Order 73-5, § 296-24-17021, filed 5/9/73 and Order 73-4, § 296-24-17021, filed 5/7/73.]

WAC 296-24-17023 Crozing machine (stationary heads). (1) Feed chains and sprockets shall be completely enclosed. This includes all types of barrel, keg, bucket, tub, and individual stave crozers, chamfering, crozing, and doweling machines. [Order 73-5, § 296-24-17023, filed 5/9/73 and Order 73-4, § 296-24-17023, filed 5/7/73.]

WAC 296-24-17025 Heading-up machine. The outside portion and teeth of both drive gears for the racks shall be completely guarded. This includes all types of heading-up machines. [Order 73-5, § 296-24-17025, filed 5/9/73 and Order 73-4, § 296-24-17025, filed 5/7/73.]

WAC 296-24-17027 Head charring machine. All tripping mechanisms shall be completely guarded. [Order 73-5, § 296-24-17027, filed 5/9/73 and Order 73-4, § 296-24-17027, filed 5/7/73.]

WAC 296-24-17029 Bilge truss hoop ring removing machine. (1) Both eccentric cams and gear works on horizontal machines shall be guarded.

(2) Combined flywheel and gear shall be completely enclosed by a guard. This includes the horizontal and upright-type machines. [Order 73-5, § 296-24-17029, filed 5/9/73 and Order 73-4, § 296-24-17029, filed 5/7/73.]

WAC 296-24-17031 Hoop elevators and conveyors. Lower sprockets and chains shall be guarded by complete enclosure to a height of at least 7 feet. [Order 73-5, § 296-24-17031, filed 5/9/73 and Order 73-4, § 296-24-17031, filed 5/7/73.]

WAC 296-24-17033 Barrel sanding machine. Belt sanding machines shall be provided with guards at each nip point where the sanding belt runs onto a pulley. This guard may be a part of the exhaust system. The unused run of the sanding belt shall be closed. [Order 73-5, § 296-24-17033, filed 5/9/73 and Order 73-4, § 296-24-17033, filed 5/7/73.]

WAC 296-24-17035 Hoop drivers and trussers. (1) All friction pulleys shall be enclosed by a guard. A hinged gate should be provided for that portion of the guard covering adjustments to the friction blocks.

(2) The foregoing recommendation covers drivers for keg hoops, tin barrel hoops, truss hoops, and both screw and rack and pinion-type hoop drivers. [Order 73-5, § 296-24-17035, filed 5/9/73 and Order 73-4, § 296-24-17035, filed 5/7/73.]

WAC 296-24-17037 Head sanding machine. The exhaust hood of automatic horizontal disk head sanders shall be so arranged as to enclose each disk, except for that portion necessary for the application of the barrel being finished. [Order 73-5, § 296-24-17037, filed 5/9/73 and Order 73-4, § 296-24-17037, filed 5/7/73.]

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WAC 296-24-17039 Hand jointer. All hand-fed jointers shall be guarded in accordance with the provisions of WAC 296-24-16521. [Order 73-5, § 296-24-17039, filed 5/9/73 and Order 73-4, § 296-24-17039, filed 5/7/73.]

WAC 296-24-17041 Hoop punching and coiling machine. Miter gear, spur gears, drive pulley, and pulley for coiling attachment shall be guarded. This includes the horizontal hoop punching and coiling machine as well as the upright hoop punching machine. [Order 73-5, § 296-24-17041, filed 5/9/73 and Order 73-4, § 296-24-17041, filed 5/7/73.]

WAC 296-24-17043 Hoop riveting machine. The balance and drive wheels shall be effectively guarded. This includes automatic, single, and double hoop riveters. [Order 73-5, § 296-24-17043, filed 5/9/73 and Order 73-4, § 296-24-17043, filed 5/7/73.]

WAC 296-24-17045 Hoop flaring and expanding machine. Gearing shall be completely enclosed. [Order 73-5, § 296-24-17045, filed 5/9/73 and Order 73-4, § 296-24-17045, filed 5/7/73.]

WAC 296-24-17047 Inspection and maintenance of cooperage machinery. For inspection and maintenance of cooperage machinery see WAC 296-24-16539. [Order 73-5, § 296-24-17047, filed 5/9/73 and Order 73-4, § 296-24-17047, filed 5/7/73.]

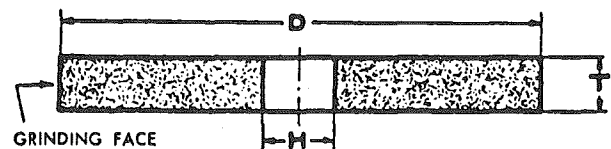
WAC 296-24-180 Abrasive wheel machinery. [Order 73-5, § 296-24-180, filed 5/9/73 and Order 73-4, § 296-24-180, filed 5/7/73.]

WAC 296-24-18001 Definitions. (1) "Type 1 straight wheels" means wheels having diameter, thickness, and hole size dimensions, and they should be used only on the periphery. Type 1 wheels shall be mounted between flanges. See Figure No. O-1.

(a) Limitation: Hole dimension (H) should not be greater than two-thirds of wheel diameter dimension (D) for precision, cylindrical, centerless, or surface grinding applications. Maximum hole size for all other applications should not exceed one-half wheel diameter.

Figure No. O-1

Type 1—Straight Wheels.



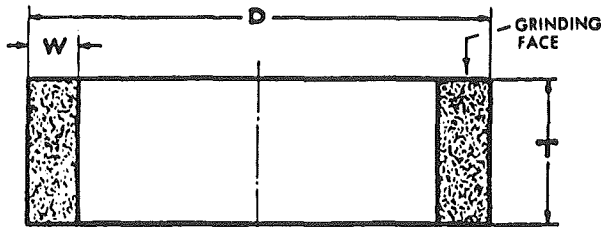
Type 1—Straight Wheel.

Peripheral grinding wheel having a diameter, thickness and hole.

(2) "Type 2 cylinder wheels" means wheels having diameter, wheel thickness, and rim thickness dimensions. Grinding is performed on the rim face only, dimension W. Cylinder wheels may be plain, plate mounted, inserted nut, or of the projecting stud type. See Figure No. O-2.

(a) Limitation: Rim height, T dimension, is generally equal to or greater than rim thickness, W dimension.

Figure No. O-2
[Type 2—Cylinder Wheel]



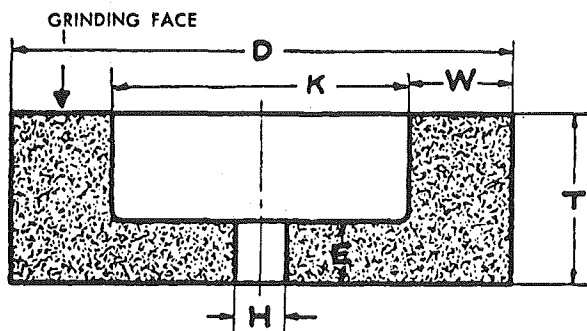
Type 2—Cylinder Wheel

Side grinding wheel having a diameter, thickness and wall—wheel is mounted on the diameter.

(3) "Type 6 straight cup wheels" means wheels having diameter, thickness, hole size, rim thickness, and back thickness dimensions. Grinding is always performed on rim face, W dimension. See Figure No. O-3.

(a) Limitation: Minimum back thickness, E dimension, should not be less than one-fourth T dimension. In addition, when unthreaded hole wheels are specified, the inside flat, K dimension, must be large enough to accommodate a suitable flange.

Figure No. O-3
Type 6—Straight Cup Wheels



Type 6—Straight-cup Wheel

Side grinding wheel having a diameter, thickness and hole with one side straight or flat and the opposite side recessed. This type, however, differs from Type 5 in that the grinding is performed on the wall of the abrasive created by the difference between the diameter of the recess and the outside diameter of the wheel. Therefore, the wall dimension "W" takes precedence over the diameter of the recess as an essential intermediate dimension to describe this shape type.

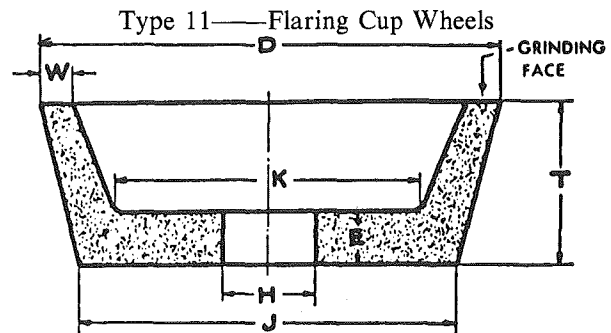
(4) "Type 11 flaring cup wheels" mean wheels having double diameter dimensions D and J and in addition have thickness, hole size, rim and back thickness dimensions. Grinding is always performed on rim face, W dimension. Type 11 wheels are subject to all limitations of use and mounting listed for type 6 straight sided cup wheels definition. See Figure No. O-4.

(a) Limitation: Minimum back thickness, E dimension, should not be less than one-fourth T dimension. In addition when unthreaded hole wheels are specified the inside flat, K dimension, shall be large enough to accommodate a suitable flange.

(5) "Modified types 6 and 11 wheels (terrazzo)" mean some type 6 and 11 cup wheels used in the terrazzo trade having tapered K dimensions to match a special tapered flange furnished by the machine builder. See Figure No. O-5.

(a) Limitation: These wheels shall be mounted only with a special tapered flange.

Figure No. O-4

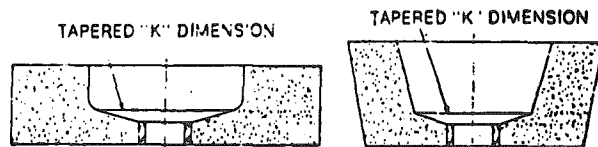


Type 11—Flaring-cup Wheel

Side grinding wheel having a wall flared or tapered outward from the back. Wall thickness at the back is normally greater than at the grinding face (W).

Figure No. O-5

Type 6 & 11—Wheels (Terrazzo)



Type 6 (Terrazzo)

Type 11 (Terrazzo)

Typical examples of modified types 6 and 11 wheels (terrazzo) showing tapered K dimensions.

(6) "Types 27 and 28 depressed center wheels" mean wheels having diameter, thickness, and hole size dimensions. Both types are reinforced, organic bonded wheels having offset hubs which permit side and peripheral grinding operations without interference with

the mounting. Type 27 wheels are manufactured with flat grinding rims permitting notching and cutting operations. Type 28 wheels have saucer shaped grinding rims.

(a) Limitations: Special supporting, back adapter and inside flange nuts are required for the proper mounting of these types of wheels subject to limitations of WAC 296-24-18007(4)(a) and (b).

(b) Mounts which are affixed to the wheel by the manufacturer may not require an inside nut and shall not be reused.

(7) "Type 27A depressed center, cutting-off wheels" mean wheels having diameter, thickness, and hole size dimensions. They are reinforced, organic bonded, offset hub type wheels, usually 16 inches diameter and larger, specially designed for use on cutting-off machines where mounting nut or outer flange interference cannot be tolerated.

(a) Limitations: See WAC 296-24-18007.

(8) "Surface feet per minute" (s.f.p.m.) means the distance in feet any one abrasive grain on the peripheral surface of a grinding wheel travels in 1 minute.

Surface Feet Per Minute =

$$\frac{3.1416 \times \text{diameter in inches} \times \text{r.p.m.}}{12}$$

12

or

$$.262 \times \text{diameter in inches} \times \text{r.p.m.}$$

Examples: (a) 24-inch diameter wheel, 1,000 revolutions per minute. Surface Feet per minute $.262 \times 24 \times 1,000 = 6,288$ s.f.p.m.

(b) 12-inch diameter wheel, 1,000 revolutions per minute. Surface Feet per minute $.262 \times 12 \times 1,000 = 3,144$ s.f.p.m.

(9) "Flanges" means collars, discs or plates between which wheels are mounted and are referred to as adaptor, sleeve, or back up type. See WAC 296-24-18007 for full description.

(10) "Snagging" means grinding which removes relatively large amounts of material without regard to close tolerances or surface finish requirements.

(11) "Off-hand grinding" means the grinding of any material or part which is held in the operator's hand.

(12) "Safety guard" means an enclosure designed to restrain the pieces of the grinding wheel and furnish all possible protection in the event that the wheel is broken in operation. See WAC 296-24-18005.

(13) "Cutting off wheels" mean wheels having diameter, thickness and hole size dimensions and are subject to all limitations of mounting and use listed for type 1 wheels, the definition in WAC 296-24-18001(1) and WAC 296-24-18009. They may be steel centered, diamond abrasive or organic bonded abrasive of the plain or reinforced type.

(a) Limitation: Cutting off wheels are recommended only for use on specially designed and fully guarded machines and are subject to the following maximum thickness and hole size limitations.

Max. thickness (inch)

Wheel diameter:	
6 inch and smaller	3/16
Larger than 6 inches to 12 inches	1/4
Larger than 12 inches to 23 inches	3/8
Larger than 23 inches	1/2

(b) Maximum hole size for cutting-off wheels should not be larger than 1/4-wheel diameter.

(14) "Abrasive wheel" means a cutting tool consisting of abrasive grains held together by organic or inorganic bonds. Diamond and reinforced wheels are included.

(15) "Organic wheels" means wheels which are bonded by means of an organic material such as resin, rubber, shellac, or other similar bonding agent.

(16) "Inorganic wheels" means wheels which are bonded by means of inorganic material such as clay, glass, porcelain, sodium silicate, magnesium oxychloride, or metal. Wheels bonded with clay, glass, porcelain or related ceramic materials are characterized as "vitrified bonded wheels". [Order 73-5, § 296-24-18001, filed 5/9/73 and Order 73-4, § 296-24-18001, filed 5/7/73.]

WAC 296-24-18003 General requirements. (1) Machine Guarding. Abrasive wheels shall be used only on machines provided with safety guards as defined in WAC 296-24-18005, except:

(a) Wheels used for internal work while within the work being ground;

(b) Mounted wheels used in portable operations 2 inches and smaller in diameter; and

(c) Types 16, 17, 18, 18R, and 19 cones, plugs, and threaded hole pot balls where the work offers protection.

(2) Guard Design. The safety guard 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, except:

(a) Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; and where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted; and

(b) The spindle end, nut, and outer flange may be exposed on machines designed as portable saws.

(3) Flanges. Grinding machines shall be equipped with flanges in accordance with WAC 296-24-18007.

(4) Work rests. On offhand grinding machines, work rests shall be used to support the work. They shall be of rigid construction and designed to be adjustable to compensate for wheel wear. Work rests shall be kept adjusted closely to the wheel with a maximum opening of one-eighth inch to prevent the work from being jammed between the wheel and the rest, which may cause wheel breakage. The work rest shall be securely clamped after each adjustment. The adjustment shall not be made with the wheel in motion.

(5) Excluded Machinery. Natural sandstone wheels and metal, wooden, cloth, or paper discs, having a layer of abrasive on the surface are not covered by WAC 296-

24-18003. [Order 73-5, § 296-24-18003, filed 5/9/73; Order 73-4, § 296-24-18003, filed 5/7/73.]

WAC 296-24-18005 Guarding of abrasive wheel machinery. (1) Cup Wheels. Cup wheels (types 6 and 11) shall be protected by:

(a) Safety guards as specified in (1) through (10) of this section.

(b) Band type guards as specified in (11) of this section; and

(c) Special "Revolving Cup Guards" which mount behind the wheel and turn with it. They shall be made of steel or other material with adequate strength and shall enclose the wheel sides upward from the back for one-third of the wheel thickness. The mounting features shall conform with all requirements of this section. It is necessary to maintain clearance between the wheel side and the guard. This clearance shall not exceed one-sixteenth inch.

(2) Guard Exposure Angles. The maximum exposure angles specified in (3) through (8) of this section shall not be exceeded. Visors or other accessory equipment shall not be included as a part of the guard when measuring the guard opening, unless such equipment has strength equal to that of the guard.

(3) Bench and Floor Stands. The angular exposure of the grinding wheel periphery and sides for safety guards used on machines known as bench and floor stands should not exceed 90° or one-fourth of the periphery. This exposure shall begin at a point not more than 65° above the horizontal plane of the wheel spindle. (See Figures O-6 and O-7 and (9) of this section.)

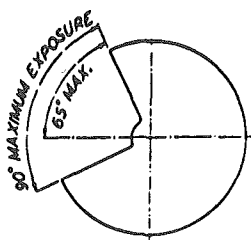


Figure No. O-6

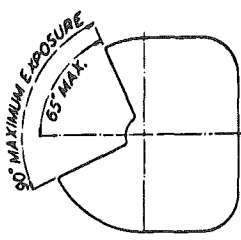


Figure No. O-7

Wherever the nature of the work requires contact with the wheel below the horizontal plane of the spindle, the exposure shall not exceed 125°. (See Figures O-8 and O-9.)

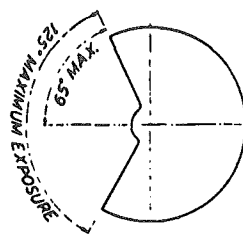


Figure No. O-8

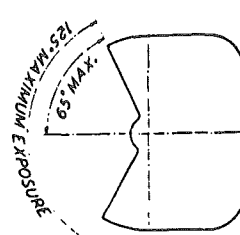


Figure No. O-9

(4) Cylindrical Grinders. The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on cylindrical grinding machines shall not exceed 180°. This exposure shall begin at a point not more than 65° above the horizontal plane of the wheel spindle. (See Figures O-10 and O-11 and (9) of this section.)

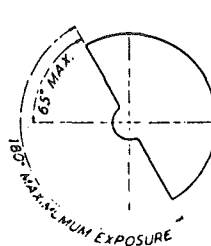


Figure No. O-10

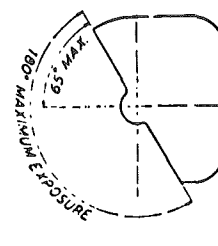


Figure No. O-11

(5) Surface Grinders and Cutting-off Machines. The maximum angular exposure of the grinding wheels periphery and sides for safety guards used on cutting-off machines and on surface grinding machines which employ the wheel periphery shall not exceed 150°. This exposure shall begin at a point not less than 15° below the horizontal plane of the wheel spindle. (See Figures O-12 and O-13.)

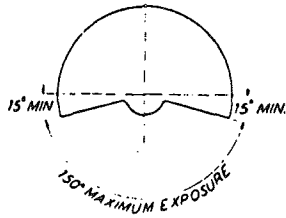


Figure No. O-12

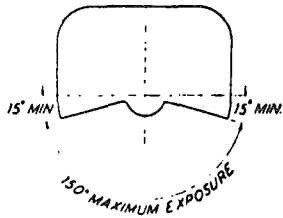


Figure No. O-13

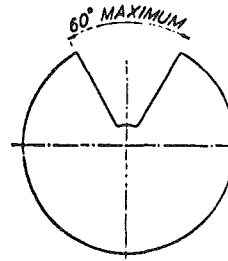


Figure No. O-16

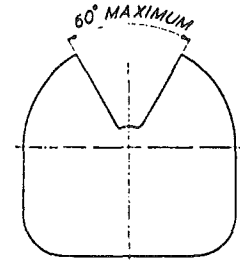


Figure No. O-17

(6) Swing Frame Grinders. The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on machines known as swing frame grinding machines shall not exceed 180°, and the top half of the wheel shall be enclosed at all times. (See Figures O-14 and O-15.)

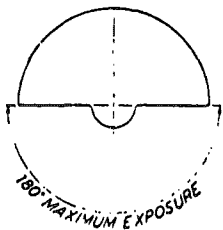


Figure No. O-14

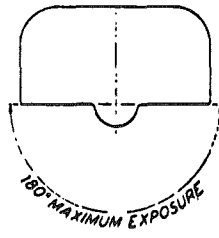


Figure No. O-15

(7) Automatic Snagging Machines. The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on grinders known as automatic snagging machines shall not exceed 180° and the top half of the wheel shall be enclosed at all times. (See Figures O-14 and O-15.)

(8) Top Grinding. Where the work is applied to the wheel above the horizontal centerline, the exposure of the grinding wheel periphery shall be as small as possible and shall not exceed 60°. (See Figures O-16 and O-17.)

(9) Exposure Adjustment. Safety guards of the types described in (3) and (4) of this section, where the operator stands in front of the opening, shall be constructed so that the peripheral protecting member can be adjusted to the constantly decreasing diameter of the wheel. The maximum angular exposure above the horizontal plane of the wheel spindle as specified in (3) and (4) of this section shall never be exceeded, and the distance between the wheel periphery and the adjustable tongue or the end of the peripheral member at the top shall never exceed one-fourth inch. (See Figures O-18, O-19, O-20, O-21, O-22, and O-23.)

(10) Material Requirements and Minimum Dimensions. (a) See Figures O-36 and O-37 and Table O-9 for minimum basic thickness of peripheral and side members for various types of safety guards and classes of service.

(b) If operating speed does not exceed 8,000 surface feet per minute cast iron safety guards, malleable iron guards or other guards as described in item (10)(c) of this subsection.

(c) Cast steel, or structural steel, safety guards as specified in Figures O-36 and O-37 and Table O-9 shall be used where operating speeds of wheels are faster than 8,000 surface feet per minute up to a maximum of 16,000 surface feet per minute.

(d) For cutting-off wheels 16 inches diameter and smaller and where speed does not exceed 16,000 surface feet per minute, cast iron or malleable iron safety guards as specified in Figures O-36 and O-37 and in Table O-9 shall be used.

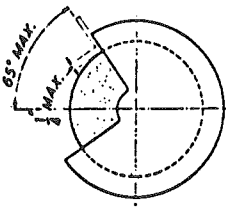


Figure No. O-18

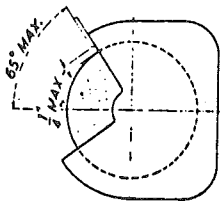


Figure No. O-19

CORRECT

Showing adjustable tongue giving required angular protection for all sizes of wheel used.

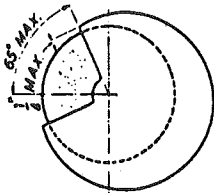


Figure No. O-20

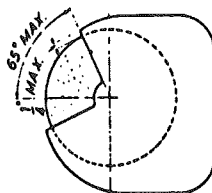


Figure No. O-21

CORRECT

Showing movable guard with opening small enough to give required protection for smallest size wheel used.

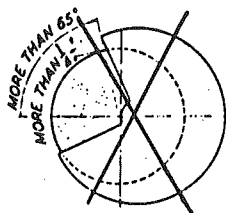


Figure No. O-22

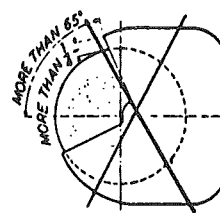


Figure No. O-23

INCORRECT

Showing movable guard with size of opening correct for full size wheel but too large for smaller wheels.

(e) For cutting-off wheels larger than 16 inches diameter and where speed does not exceed 14,200 surface feet per minute, safety guards as specified in Figures O-27 and O-28, and in Table O-1 shall be used.

(f) For thread grinding wheels not exceeding 1 inch in thickness cast iron or malleable iron safety guards as specified in Figures O-36 and O-37, and in Table O-9 shall be used.

(11) Band Type Guards—General Specifications. Band type guards shall conform to the following general specifications:

(a) The bands shall be of steel plate or other material of equal or greater strength. They shall be continuous, the ends being either riveted, bolted, or welded together in such a manner as to leave the inside free from projections.

(b) The inside diameter of the band shall not be more than 1 inch larger than the outside diameter of the wheel, and shall be mounted as nearly concentric with the wheel as practicable.

(c) The band shall be of sufficient width and its position kept so adjusted that at no time will the wheel protrude beyond the edge of the band a distance greater than that indicated in Figure O-29 and in Table O-2 or the wall thickness (W), whichever is smaller.

(12) Guard Design Specifications. 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 shall not apply to natural sandstone wheels or metal, wooden, cloth, or paper discs, having a layer of abrasive on the surface. [Order 76-6, § 296-24-18005, filed 3/1/76; Order 73-5, § 296-24-18005, filed 5/9/73 and Order 73-4, § 296-24-18005, filed 5/7/73.]

WAC 296-24-18007 Flanges. (1) General Requirements. All abrasive wheels shall be mounted between flanges which shall not be less than one-third the diameter of the wheel.

(a) Exceptions:

(i) Mounted wheels.

(ii) Portable wheels with threaded inserts or projecting studs.

(iii) Abrasive discs (inserted nut, inserted washer and projecting stud type).

(iv) Plate mounted wheels.

(v) Cylinders, cup, or segmental wheels that are mounted in chucks.

(vi) Types 27 and 28 wheels.

(vii) Certain internal wheels.

(viii) Modified types 6 and 11 wheels (terrazzo).

(ix) Cutting-off wheels, Types 1 and 27A (see (b) and (c) of this section.)

(b) Type 1 cutting-off wheels are to be mounted between properly relieved flanges which have matching bearing surfaces. Such flanges shall be at least one-fourth the wheel diameter.

(c) Type 27A cutting-off wheels are designed to be mounted by means of flat, not relieved, flanges having matching bearing surfaces and which may be less than one-third but shall not be less than one-fourth the wheel diameter. (See Figure O-24 for one such type of mounting.)

(d) There are three general types of flanges:

(i) Straight relieved flanges (see Figure O-32);

(ii) Straight unrelieved flanges (see Figure O-30);

(iii) Adaptor flanges (see Figures O-33 and O-34).

(e) Regardless of flange type used, the wheel shall always be guarded. Blotters shall be used in accordance with (6) of this section.

(2) Design and Material. (a) Flanges shall be of such design as to satisfactorily transmit the driving torque from the spindle to the grinding wheel.

(b) Flanges may be made of steel, cast iron, or other material of equal or greater strength and rigidity.

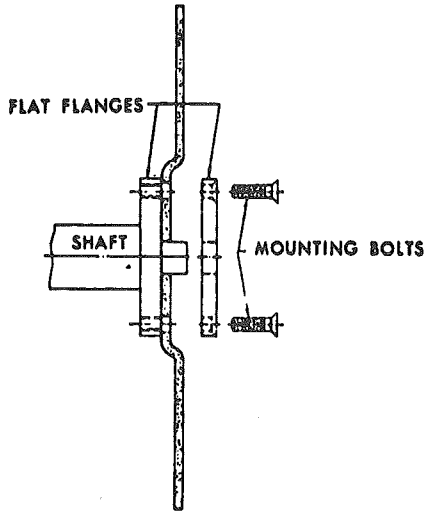


Figure No. O-24

The type 27A Wheel is mounted between flat non-relieved flanges of equal bearing surfaces.

(c) Flanges shall be designed with respect to rigidity so that when tightened, the radial width of bearing surface of contact on the wheel is maintained. (See Table O-6 and Figure O-32.)

(3) Finish and Balance. Flanges shall be dimensionally accurate and in good balance. There shall be no rough surfaces or sharp edges.

(4) Uniformity of Diameter. (a) Both flanges, of any type, between which a wheel is mounted, shall be of the same diameter and have equal bearing surface. Exceptions are set forth in (4)(b) and (c).

(b) Type 27 and Type 28 wheels, because of their shape and usage, require specially designed adaptors. The back flange shall extend beyond the central hub or raised portion and contact the wheel to counteract the side pressure on the wheel in use. The adaptor nut which is less than the minimum one-third diameter of wheel fits in the depressed side of wheel to prevent interference in side grinding and serves to drive the wheel by its clamping force against the depressed portion of the back flange. The variance in flange diameters, the adaptor nut being less than one-third wheel diameter, and the use of side pressure in wheel operation limit the use to reinforced organic bonded wheels. Mounts which are affixed to the wheel by the manufacturer shall not be re-used. Type 27 and Type 28 wheels shall be used only

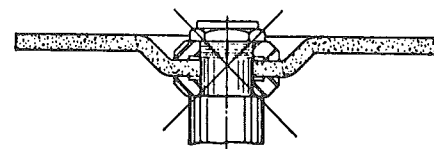
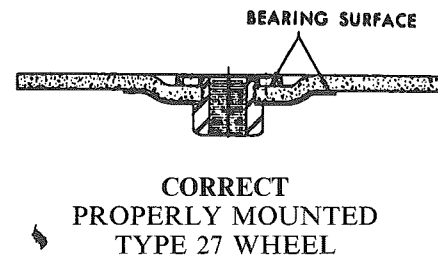
with a safety guard located between wheel and operator during use. (See Figure O-24-A.)

(c) Modified Types 6 and 11 wheels (terrazzo) with tapered K dimension.

(5) Recess and Undercut. (a) Straight relieved flanges made according to Table O-6 and Figure O-32 shall be recessed at least one-sixteenth inch on the side next to the wheel for a distance as specified in Table O-6.

(b) Straight flanges of the adaptor or sleeve type (Table O-7 and Figures O-33 and O-34) shall be undercut so that there will be no bearing on the sides of the wheel within one-eighth inch of the arbor hole.

Figure No. O-24-A



INCORRECT
IMPROPERLY MOUNTED
TYPE 27 WHEEL

Types 27 and 28 wheels, because of their shape, require specially designed adaptors.

(6) Blotters. (a) Blotters (compressible washers) shall always be used between flanges and abrasive wheel surfaces to insure uniform distribution of flange pressure. (See WAC 296-24-18009.)

(b) Exception:

(i) Mounted wheels.

(ii) Abrasive discs (inserted nut, inserted washer, and projecting stud type.)

(iii) Plate mounted wheels.

(iv) Cylinders, cups, or segmental wheels that are mounted in chucks.

(v) Types 27 and 28 wheels.

(vi) Certain Type 1 and Type 27A cutting-off wheels.

(vii) Certain internal wheels.

(viii) Type 4 tapered wheels.

(ix) Diamond wheels, except certain vitrified diamond wheels.

(x) Modified types 6 and 11 wheel (terrazzo)—blotters applied flat side of wheel only.

(7) Driving Flange. The driving flange shall be securely fastened to the spindle and the bearing surface shall run true. When more than one wheel is mounted between a single set of flanges, wheels may be cemented together or separated by specially designed spacers. Spacers shall be equal in faces. (See WAC 296-24-18009(6).)

(8) Dimensions. (a) Tables O-4 and O-6 and Figures O-30 and O-32 show minimum dimensions for straight relieved and unrelieved flanges for use with wheels with small holes that fit directly on the machine spindle. Dimensions of such flanges shall never be less than indicated and should be greater where practicable.

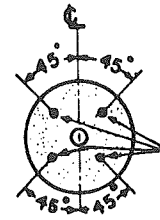
(b) Table O-5, and Table O-7 and Figures O-31, O-33, O-34 show minimum dimensions for straight adaptor flanges for use with wheels having holes larger than the spindle. Dimensions of such adaptor flanges shall never be less than indicated and should be greater where practicable.

(c) Table O-8 and Figure O-35 show minimum dimensions for straight flanges that are an integral part of wheel sleeves which are frequently used on precision grinding machines. Dimensions of such flanges shall never be less than indicated and should be greater where practicable.

(9) Repairs and Maintenance. All flanges shall be maintained in good condition. When the bearing surfaces become worn, warped, sprung, or damaged they should be trued or refaced. When refacing or truing, care shall be exercised to make sure that proper relief and rigidity is maintained as specified in (2) and (5) of this section and they shall be replaced when they do not conform to these requirements and Table O-4, Figure O-30, Table O-5, Figure O-31, Table O-6, Figure O-32, and Table O-35. Failure to observe these rules might cause excessive flange pressure around the hole of the wheel. This is especially true of wheel-sleeve or adaptor flanges. [Order 73-5, § 296-24-18007, filed 5/9/73 and Order 73-4, § 296-24-18007, filed 5/7/73.]

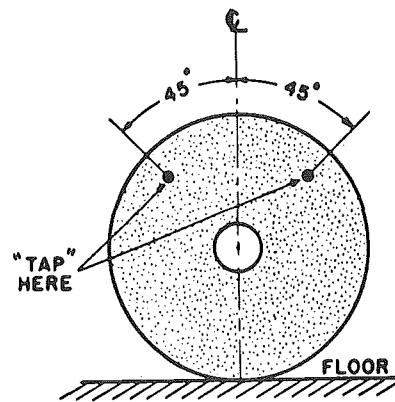
WAC 296-24-18009 Mounting. (1) Inspection. Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged in transit, storage, or otherwise. The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Wheels should be tapped gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. If they sound cracked (dead), they shall not be used. This is known as the "Ring Test".

(a) Wheels must be dry and free from sawdust when applying the ring test, otherwise the sound will be deadened. It should also be noted that organic bonded wheels do not emit the same clear metallic ring as do vitrified and silicate wheels.



Light Wheels
Suspend from hole by
small pin or flanger

Figure No. O-25



Heavy Wheels
Support on clean hard floor

Figure No. O-26

(b) "Tap" wheels about 45° each side of the vertical centerline and about 1 or 2 inches from the periphery as indicated by the spots in Figure O-25 and Figure O-26. Then rotate the wheel 45° and repeat the test. A sound and undamaged wheel will give a clear metallic tone. If cracked, there will be a dead sound and not a clear "ring".

(2) Arbor Size. Grinding wheels shall fit freely on the spindle and remain free under all grinding conditions. A controlled clearance between the wheel hole and the machine spindle (or wheel sleeves or adaptors) is essential to avoid excessive pressure from mounting and spindle expansion. To accomplish this, the machine spindle shall be made to nominal (standard) size plus zero minus .002 inch, and the wheel hole shall be made suitably oversize to assure safety clearance under the conditions of operating heat and pressure.

(3) Surface Condition. All contact surfaces of wheels, blotters and flanges shall be flat and free of foreign matter.

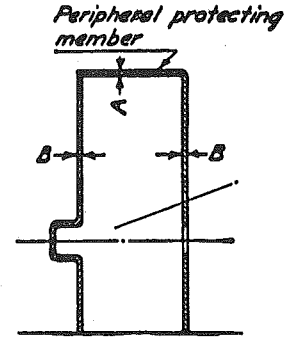
(4) Bushing. When a bushing is used in the wheel hole it shall not exceed the width of the wheel and shall not contact the flanges.

(5) Blotters. When blotters or flange facings of compressible material are required, they shall cover entire contact area of wheel flanges. Highly compressible material such as blotting paper as normally used should not exceed .025 inch in thickness. If material of lower compressibility is used, greater thickness may be necessary. Blotters need not be used with the following types of wheels:

- (a) Mounted wheels.
- (b) Abrasive discs (inserted nut, inserted washer, and projecting-stud type).
- (c) Plate mounted wheels.
- (d) Cylinders, cups, or segmental wheels that are mounted in chucks.
- (e) Types 27 and 28 wheels.
- (f) Certain Type 1 and Type 27A cutting-off wheels.
- (g) Certain internal wheels.
- (h) Type 4 tapered wheels.
- (i) Diamond wheels, except certain vitrified diamond wheels.

(6) Multiple Wheel Mounting. When more than one wheel is mounted between a single set of flanges, wheels may be cemented together or separated by specially designed spacers. Spacers shall be equal in diameter to the mounting flanges and have equal bearing surfaces. When mounting wheels which have not been cemented together, or ones which do not utilize separating spacers, care must be exercised to use wheels specially manufactured for that purpose.

(7) Replacing Safety Guard. After mounting a wheel, care should be taken to see that the safety guard is properly positioned before starting the wheel.



Section X-X

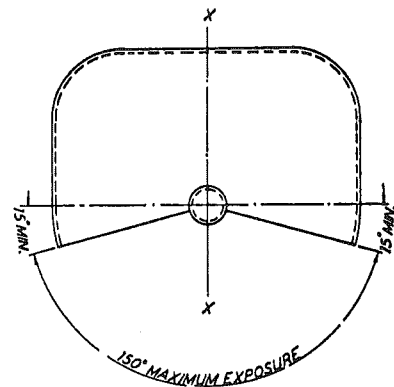


Figure No. O-28

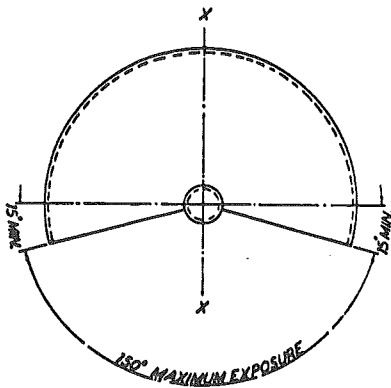


Figure No. O-27

TABLE O-1

MINIMUM BASIC THICKNESS FOR PERIPHERAL AND SIDE MEMBERS FOR SAFETY GUARDS USED WITH CUTTING-OFF WHEELS

[TABLE O-1: Part 1—6" through 30"]

Material used in construction of guard	Maximum thickness of cutting off wheel	Speed not to exceed	Cutting off wheel diameters					
			6 to 11 inches		Over 11 to 20 in.		Over 20 to 30 in.	
			A	B	A	B	A	B
Structural steel min. tensile strength 60,000 p.s.i.)	1/2 inch or less	14,200 SFPM	1/16	1/16	3/32	3/32	1/8	1/8
	1/2 inch or less	16,000 SFPM	3/32	1/8	1/8	1/8	3/16	1/8

[TABLE O-1: Part 2—Over 30" through 72"]

Material used in construction of guard	Maximum thickness of cutting off wheel	Speed not to exceed	Cutting off wheel diameters			
			Over 30 to 48 in.		Over 48 to 72 in.	
			A	B	A	B
Structural steel min. tensile strength 60,000 p.s.i.)	1/2 inch or less	14,200 SFPM	3/16	3/16	1/4	1/4
	1/2 inch or less	16,000 SFPM	1/4	3/16	5/16	1/4

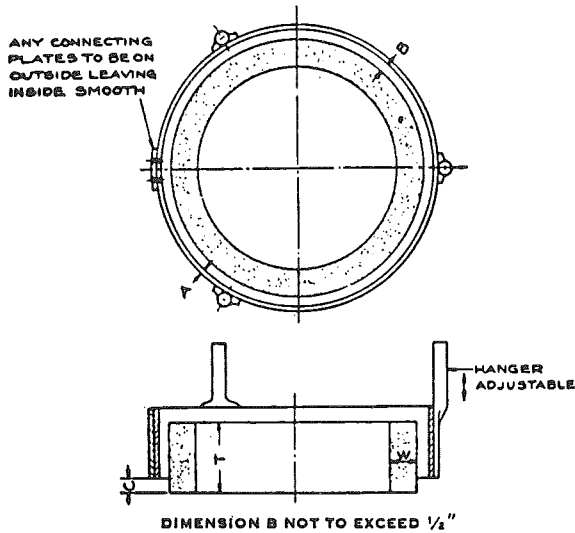


Figure No. O-29

TABLE O-2
EXPOSURE VERSUS WHEEL THICKNESS

Overall thickness of wheel (T) (inches)	Maximum exposure of wheel (C) (inches)
1/2	1/4
1	1/2
2	3/4
3	1
4	1 1/2
5 and over	2

TABLE O-3

GUIDE FOR CONSTRUCTION OF BAND TYPE
[Maximum Wheel Speed 7,000 SFPM]

Minimum material specifications	Diameter of wheel	Minimum thickness of band A	Minimum distance between rivets		Maximum distance between centers of rivets
			Inches	Inches	
Hot rolled steel SAE 1008	Under 8	1/16	3/16	3/4	
	8 to 24	1/8	1/4	1	
	Over 24 to 30	1/4	3/8	1 1/4	

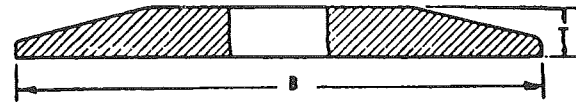


Figure No. O-30

Driving flange secured to spindle for use only on portable wheels with threaded inserts or projecting studs.

TABLE O-4

MINIMUM DIMENSIONS FOR STRAIGHT UNRELIEVED FLANGES FOR WHEELS WITH THREADED INSERTS OR PROJECTING STUDS

A	B ¹	T
Diameter of wheel	Minimum outside diameter of flange	Minimum thickness of flange
Inches	Inches	Inches
1	5/8	1/8
2	1	1/8
3	1	3/16
4	1 3/8	3/16
5	1 3/4	1/4
6	2	3/8

¹ NOTE: Must be large enough to extend beyond the bushing. Where prong anchor or cupback bushing are used, this footnote does not apply.

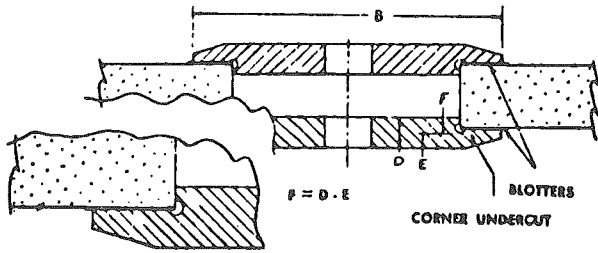


Figure No. O-31

TABLE O-5

MINIMUM DIMENSIONS FOR STRAIGHT ADAPTOR FLANGE FOR ORGANIC BONDED WHEELS OVER 1 1/4 INCHES THICK¹

Wheel diameter	Wheel hole diameter	B Minimum flange diameter	D Minimum thickness of flange at bore	E Minimum thickness of flange at edge of undercut	F ¹ (D-E) Minimum thickness
Inches	Inches	Inches	Inches	Inches	Inches
12 to 14	4	6	7/8	3/8	1/2
	5	7	7/8	3/8	1/2
	6	8	7/8	3/8	1/2
Larger than 14 to 18	4	6	7/8	3/8	1/2
	5	7	7/8	3/8	1/2
	6	8	7/8	3/8	1/2
	7	9	7/8	3/8	1/2
	8	10	7/8	3/8	1/2
Larger than 18 to 24	6	8	1	1/2	1/2
	7	9	1	1/2	1/2
	8	10	1	1/2	1/2
	10	12	1	1/2	1/2
	12	14	1	1/2	1/2
Larger than 24 to 30	12	15	1	1/2	1/2
Larger than 30 to 36	12	15	1 3/8	7/8	1/2

¹For wheels under 1/4 inches thick F dimension shall not exceed 40 percent of wheel thickness.

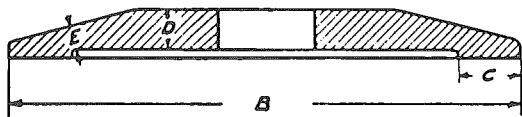


Figure No. O-32

Driving flange secured to spindle.

TABLE O-6

MINIMUM DIMENSIONS FOR STRAIGHT RELIEVED FLANGES

A ¹ Diameter of wheel	B Minimum outside diameter of flanges	C Radial width of bearing surface		D Minimum thickness of flange at bore	E Minimum thickness of flange at edge of recess
Inches	Inches	Minimum	Maximum	Inches	Inches
1	3/6	1/16	1/8	1/16	1/16
2	3/4	1/8	3/16	1/8	3/32
3	1	1/8	3/16	3/16	3/32
4	1 3/8	1/8	3/16	3/16	1/8
5	1 3/4	3/16	1/4	1/4	1/8
6	2	1/4	1/2	3/8	3/16
7	2 1/2	1/4	1/2	3/8	3/16
8	3	1/4	1/2	3/8	3/16
10	3 1/2	5/16	5/8	3/8	1/4
12	4	5/16	5/8	1/2	5/16
14	4 1/2	3/8	3/4	1/2	5/16
16	5 1/2	1/2	1	1/2	5/16
18	6	1/2	1	5/8	3/8
20	7	5/8	1 1/4	5/8	3/8
22	7 1/2	5/8	1 1/4	5/8	7/16
24	8	3/4	1 1/4	5/8	7/16
26	8 1/2	3/4	1 1/4	5/8	1/2
28	10	7/8	1 1/2	3/4	1/2
30	10	7/8	1 1/2	3/4	5/8
36	12	1	2	7/8	3/4
42	14	1	2	7/8	3/4
48	16	1 1/4	2	1 1/8	1
60	20	1 1/4	2	1 1/4	1 1/8
72	24	1 1/2	2 1/2	1 3/8	1 1/4

¹Flanges for wheels under 2 inches diameter may be unrelieved and shall be maintained flat and true.

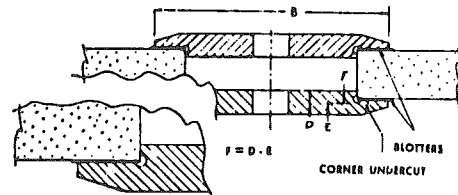


Figure No. O-33

Central Nut Mounting
Driving flange secured to spindle.

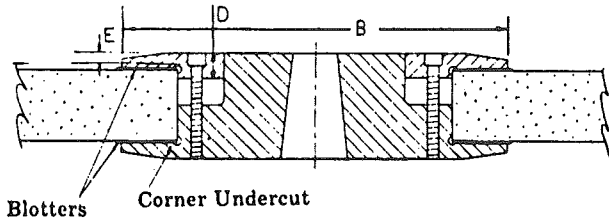


Figure No. O-34

Multiple Screw Mounting

Driving flange secured to spindle.

TABLE O-7

MINIMUM DIMENSIONS FOR STRAIGHT FLANGES FOR MECHANICAL GRINDERS
12,500 S.F.P.M. TO 16,500 S.F.P.M.¹

Wheel diameter	Wheel hole diameter	B Minimum flange diameter	D Minimum thickness of flange at bore	E Minimum thickness of flange at edge of undercut	F ² (D-E) minimum thickness
20	6	8	1	1/2	1/2
20	8	10	1 1/2	3/4	3/4
24	12	15	2	1	1
30	12	15	2	1	1
36	12	15	2	1	1

¹Flange shall be of steel, quality SAE 1040 or equivalent, annealed plate, heat treated to R_c 25-30.

²For wheels under 1 1/4 inch thick F dimension shall not exceed 40 percent of wheel thickness.

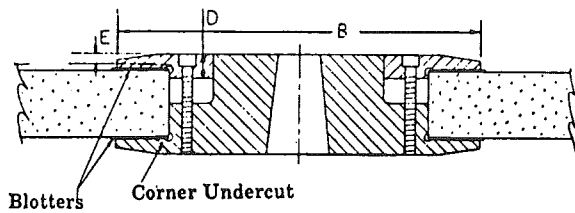


Figure No. O-35

Driving flange secured to spindle.

TABLE O-8

MINIMUM DIMENSIONS FOR STRAIGHT FLANGES USED AS WHEEL SLEEVES FOR PRECISION GRINDING ONLY

Wheel diameter	Wheel hole diameter	B Minimum outside diameter of flange	D Minimum thickness of flange at bore	E Minimum thickness of flange at edge of undercut
12 to 14	5	7	1/2	7/16
	5	7	5/8	7/16
	6	8	5/8	7/16
Larger than 14 to 20	8	10	5/8	7/16
	10	11 1/2	5/8	7/16
	12	13 1/2	5/8	7/16
Larger than 20 to 30	8	10	3/4	1/2
	10	11 1/2	3/4	1/2
	12	13 1/2	3/4	1/2
	16	17 1/2	3/4	1/2
Larger than 30 to 42	12	13 1/2	3/4	1/2
	16	17 1/2	3/4	1/2
	18	19 1/2	3/4	1/2
	20	21 1/2	3/4	1/2
Larger than 42 to 60	16	20	1	3/4
	20	24	1	3/4
	24	29	1 1/8	7/8

NOTE: These flanges may be clamped together by means of a central nut, or by a series of bolts or some other equivalent means of fastening. For hole sizes smaller than shown in this table, use table 12.

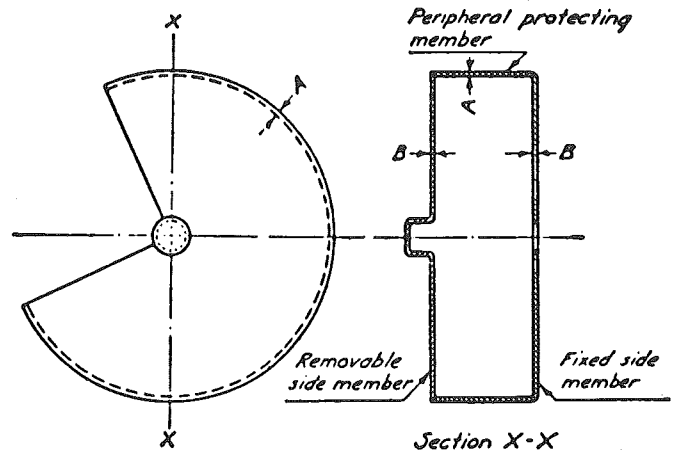


Figure No. O-36

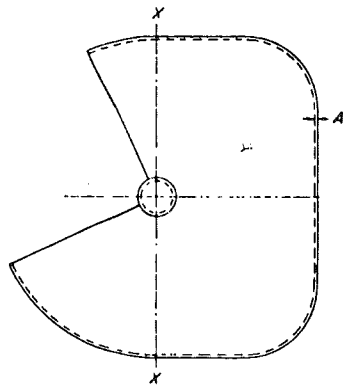


Figure No. O-37

TABLE O-9

MINIMUM BASIC THICKNESSES OF PERIPHERAL AND SIDE MEMBERS FOR SAFETY GUARDS

[TABLE O-9: Part 1—Diameters 3" to 12"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		3 to 6 inches		Over 6 to 12 inches	
		A	B	A	B
	Inches	Inches		Inches	
Material satisfactory ¹ for speeds up to 8,000 SFPM.	2	1/4	1/4	3/8	5/16
Cast iron (min. tensile strength 20,000 p.s.i.) Class 20.	4	5/16	5/16	3/8	5/16
	6	3/8	5/16	1/2	7/16
	8			5/8	9/16
	10			3/4	11/16
	16				
	20				
Material satisfactory ¹ for speeds up to 9,000 SFPM.	2	1/4	1/4	3/8	5/16
Malleable iron (min. tensile strength 50,000 p.s.i.) Grade 32510.	4	5/16	5/16	3/8	5/16
	6	3/8	5/16	1/2	7/16
	8			1/2	7/16
	10			1/2	7/16
	16				
	20				
Materials satisfactory ¹ for speeds up to 16,000 SFPM.	2	1/4	1/4	5/16	5/16
Steel castings (min. tensile strength 60,000 p.s.i.) Grade V60-30.	4	1/4	1/4	1/2	1/2
	6	3/8	1/4	3/4	5/8
	8			7/8	3/4
	10			1	7/8
	16				
	20				

[TABLE O-9: Part 1—Diameters 3" to 12"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		3 to 6 inches		Over 6 to 12 inches	
		A	B	A	B
	Inches	Inches		Inches	
Structural steel (min. tensile strength 60,000 p.s.i.).	2	1/8	1/16	5/16	1/4
	4	1/8	1/16	3/8	5/16
	6	3/16	1/16	1/2	3/8
	8			1/2	3/8
	10			9/16	7/16
	16				
	20				

¹The recommendations listed in the above table are guides for the conditions stated. Other material, designs or dimensions affording equal or superior protection are also acceptable.

[TABLE O-9: Part 2—Diameters Over 12" to 20"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		Over 12 to 16 inches		Over 16 to 20 inches	
		A	B	A	B
	Inches	Inches		Inches	
Material satisfactory ¹ for speeds up to 8,000 SFPM.	2	1/2	3/8	5/8	1/2
Cast iron (min. tensile strength 20,000 p.s.i.) Class 20.	4	1/2	3/8	3/4	5/8
	6	5/8	1/2	1	5/8
	8	7/8	3/4	1	3/4
	10	7/8	3/4	1	3/4
	16	1-1/8	1	1-1/4	1
	20			1-3/8	1-1/8
Material satisfactory ¹ for speeds up to 9,000 SFPM.	2	1/2	3/8	5/8	1/2
Malleable iron (min. tensile strength 50,000 p.s.i.) Grade 32510.	4	1/2	3/8	5/8	1/2
	6	5/8	1/2	3/4	5/8
	8	5/8	1/2	3/4	5/8
	10	5/8	1/2	3/4	5/8
	16	13/16	11/16	13/16	11/16
	20			7/8	3/4
Materials satisfactory ¹ for speeds up to 16,000 SFPM.	2	3/8	3/8	1/2	7/16
Steel castings (min. tensile strength 60,000 p.s.i.) Grade V60-30.	4	1/2	1/2	9/16	1/2
	6	3/4	5/8	3/4	5/8
	8	7/8	3/4	7/8	3/4
	10	1	7/8	1	7/8
	16	1-1/4	1-1/8	1-1/4	1-1/8
	20			1-3/8	1-1/4

[TABLE O-9: Part 2—Diameters Over 12" to 20"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		Over 12 to 16 inches		Over 16 to 20 inches	
		A	B	A	B
	Inches	Inches		Inches	
Structural steel (min. tensile strength 60,000 p.s.i.)	2	5/16	1/4	5/16	1/4
	4	3/8	5/16	3/8	5/16
	6	7/16	3/8	7/16	3/8
	8	9/16	7/16	9/16	7/16
	10	5/8	1/2	5/8	1/2
	16	5/8	9/16	3/4	5/8
	20			13/16	11/16

¹The recommendations listed in the above table are guides for the conditions stated. Other material, designs or dimensions affording equal or superior protection are also acceptable.

[TABLE O-9: Part 3—Diameters Over 20" to 40"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		Over 20 to 24 inches		Over 24 to 40 inches	
		A	B	A	B
	Inches	Inches		Inches	
Material satisfactory ¹ for speeds up to 8,000 SFPM.	2	7/8	5/8	1	3/4
	4	1	5/8	1-1/8	3/4
	6	1-1/8	3/4	1-1/4	7/8
	8	1-1/8	3/4	1-1/4	7/8
Cast iron (min. tensile strength 20,000 p.s.i.) Class 20.	10	1-1/8	3/4	1-1/4	7/8
	16	1-5/16	1	1-7/16	1-1/16
	20	1-3/8	1-1/8	1-1/2	1-3/8
Material satisfactory ¹ for speeds up to 9,000 SFPM.	2	3/4	5/8	7/8	3/4
	4	3/4	5/8	7/8	3/4
	6	7/8	5/8	1	3/4
	8	7/8	5/8	1	3/4
Malleable iron (min. tensile strength 50,000 p.s.i.) Grade 32510.	10	7/8	5/8	1	3/4
	16	1	3/4	1-1/8	7/8
	20	1	3/4	1-1/8	7/8
Materials satisfactory ¹ for speeds up to 16,000 SFPM.	2	5/8	1/2	3/4	5/8
	4	5/8	1/2	3/4	5/8
	6	13/16	11/16	13/16	11/16
	8	7/8	3/4	15/16	13/16
Steel castings (min. tensile strength 60,000 p.s.i.) Grade V60-30.	10	1-1/8	15/16	1-1/8	1
	16	1-1/4	1-1/8	1-1/4	1-1/8
	20	1-3/8	1-1/4	1-7/16	1-5/16

[TABLE O-9: Part 3—Diameters Over 20" to 40"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters			
		Over 20 to 24 inches		Over 24 to 40 inches	
		A	B	A	B
	Inches	Inches		Inches	
Structural steel (min. tensile strength 60,000 p.s.i.)	2	5/16	1/4	3/8	5/16
	4	3/8	5/16	3/8	5/16
	6	7/16	3/8	7/16	3/8
	8	9/16	7/16	5/8	1/2
	10	5/8	1/2	5/8	1/2
	16	3/4	5/8	13/16	11/16
	20	13/16	11/16	7/8	3/4

¹The recommendations listed in the above table are guides for the conditions stated. Other material, designs or dimensions affording equal or superior protection are also acceptable.

[TABLE O-9: Part 4—Diameters Over 40" to 48"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters	
		Over 40 to 48 inches	
		A	B
	Inches	Inches	
Material satisfactory ¹ for speeds up to 8,000 SFPM.	2	1-1/4	1
	4	1-3/8	1
	6	1-1/2	1-1/8
	8	1-1/2	1-1/8
Cast iron (min. tensile strength 20,000 p.s.i.) Class 20.	10	1-1/2	1-1/8
	16	1-3/4	1-3/8
	20	2	1-5/8
Material satisfactory ¹ for speeds up to 9,000 SFPM.	2	1	7/8
	4	1-1/8	7/8
	6	1-1/4	7/8
	8	1-1/4	7/8
Malleable iron (min. tensile strength 50,000 p.s.i.) Grade 32510.	10	1-1/4	7/8
	16	1-3/8	1
	20	1-1/2	1-1/8

[TABLE O-9: Part 4—Diameters Over 40" to 48"]

Material used in construction of guard	Maximum thickness of grinding wheel	Grinding wheel diameters	
		Over 40 to 48 inches	
		A	B
	Inches	Inches	
Material satisfactory ¹ for speeds up to 16,000 SFPM.	2	7/8	3/4
	4	1	3/4
	6	1-1/8	3/4
	8	1-3/8	1
	10	1-7/16	1-1/16
Steel castings (min. tensile strength 11/16 60,000 p.s.i.) Grade V60-30.	16	1-13/16	1-7/16
	20	2-1/16	1-
	2	1/2	3/8
	4	1/2	3/8
Structural steel (min. tensile strength 60,000 p.s.i.).	6	3/4	1/2
	8	3/4	1/2
	10	7/8	5/8
	16	1-1/16	13/16
	20	1-3/16	15/16

¹The recommendations listed in the above table are guides for the conditions stated. Other material, designs or dimensions affording equal or superior protection are also acceptable.

[Order 73-5, § 296-24-18009, filed 5/9/73 and Order 73-4, § 296-24-18009, filed 5/7/73.]

WAC 296-24-190 Mills and calenders in the rubber and plastics industries. [Order 73-5, § 296-24-190, filed 5/9/73 and Order 73-4, § 296-24-190, filed 5/7/73.]

WAC 296-24-19001 Definitions. (1) "Bite" means the nip point between any two inrunning rolls.

(2) "Calender" means a machine equipped with two or more metal rolls revolving in opposite directions and used for continuously sheeting or plying up rubber and plastics compounds and for frictioning or coating materials with rubber and plastics compounds.

(3) "Mill" means a machine consisting of two adjacent metal rolls, set horizontally, which revolve in opposite directions (i.e. toward each other as viewed from above) used for the mechanical working of rubber and plastics compounds. [Order 73-5, § 296-24-19001, filed 5/9/73 and Order 73-4, § 296-24-19001, filed 5/7/73.]

WAC 296-24-19003 General requirements. (1) New Installations. All new installations after August 27, 1971, shall be in conformity with WAC 296-24-190 through WAC 296-24-19015.

(2) Existing Installations. All existing plant installations or equipment contracted for prior to the effective date of these standards, shall comply with WAC 296-24-190 through WAC 296-24-19015.

(3) Auxiliary Equipment. Mechanical and electrical equipment and auxiliaries shall be installed in accordance with this section and the State of Washington Safety Standards for Installing Electric Wires and Equipment, WAC 296-24-950 through 296-24-955.

(4) Mill Roll Heights. All new mill installations shall be installed so that the top of the operating rolls is not less than 50 inches above the level on which the operator stands, irrespective of the size of the mill. This distance shall apply to the actual working level, whether it be at the general floor level, in a pit, or on a platform. [Order 76-6, § 296-24-19003, filed 3/1/76; Order 73-5, § 296-24-19003, filed 5/9/73 and Order 73-4, § 296-24-19003, filed 5/7/73.]

WAC 296-24-19005 Mill safety controls. (1) Safety Trip Control. A safety trip control shall be provided in front and in back of each mill. It shall be accessible and shall operate readily on contact. The safety trip control shall be one of the following types or a combination thereof.

(a) Pressure-sensitive body bars. Installed at front and back of each mill having a 46-inch roll height or over. These bars shall operate readily by pressure of the mill operator's body. Pressure-sensitive body bars should be installed on new equipment.

(b) Safety triprod. Installed in the front and in the back of each mill and located with 2 inches of a vertical plane tangent to the front and rear rolls. The top rods shall be not more than 72 inches above the level on which the operator stands. The triprods shall be accessible and shall operate readily whether the rods are pushed or pulled.

(c) Safety tripwire cable or wire center cord. Installed in the front and in the back of each mill and located within 2 inches of a vertical plane tangent to the front and rear rolls. The cables shall not be more than 72 inches above the level on which the operator stands. The tripwire cable or wire center cord shall operate readily whether cable or cord is pushed or pulled.

(2) Fixed Guards. A fixed bar across the front and one across the back of the mill approximately 40 inches vertically above the working level and 20 inches horizontally from the crown face of the roll should be used where they are applicable.

(3) Auxiliary Equipment. All auxiliary equipment such as mill divider, support bars, spray pipes, feed conveyors, strip knives, etc., shall be located in such a manner as to avoid interference with access to and operation of safety devices. [Order 73-5, § 296-24-19005, filed 5/9/73 and Order 73-4, § 296-24-19005, filed 5/7/73.]

WAC 296-24-19007 Calender safety controls. (1) Safety Trip, Face. A—safety triprod, cable, or wire center cord shall be provided across each pair of in-running rolls extending the length of the face of the rolls. It shall be readily accessible and operate whether pushed or

pulled. The safety tripping devices shall be located within reach of the operator and the bite.

(2) Safety Trip, Side. On both sides of the calender and near each end of the face of the roll, there shall be a cable or wire center cord connected to the safety trip. These lines should be not more than 12 inches from the faces of the respective rolls and not less than 2 inches from the calender frame. They should be anchored to the frame not more than 6 inches from the floor or operator's platform. They shall operate readily when pushed or pulled. [Order 73-5, § 296-24-19007, filed 5/9/73 and Order 73-4, § 296-24-19007, filed 5/7/73.]

WAC 296-24-19009 Protection by location. (1) Mills. Where a mill is so installed that persons cannot normally reach through, over, under or around to come in contact with the roll bite or be caught between a roll and an adjacent object, then, provided such elements are made a fixed part of a mill, safety control devices listed in WAC 296-24-19005 shall not apply.

(2) Calenders. Where a calender is so installed that persons cannot normally reach through, over, under, or around to come in contact with the roll bite or be caught between a roll and an adjacent object, then, provided such elements are made a fixed part of a calender, safety control devices listed in WAC 296-24-19007 shall not apply. [Order 73-5, § 296-24-19009, filed 5/9/73 and Order 73-4, § 296-24-19009, filed 5/7/73.]

WAC 296-24-19011 Trip and emergency switches. All trip and emergency switches shall not be of the automatically resetting type, but shall require manual resetting. [Order 73-5, § 296-24-19011, filed 5/9/73 and Order 73-4, § 296-24-19011, filed 5/7/73.]

WAC 296-24-19013 Stopping limits. (1) Determination of Distance of Travel. All measurements on mills and calenders shall be taken with the rolls running empty at maximum operating speed. Stopping distances shall be expressed in inches of surface travel of the roll from the instant the emergency stopping device is actuated.

(2) Stopping Limits for Mills. All mills irrespective of the size of the rolls or their arrangement (individually or group-driven) shall be stopped within a distance, as measured in inches of surface travel, not greater than 1 1/2 percent of the peripheral no-load surface speeds of the respective rolls as determined in feet per minute.

(3) Stopping Limits for Calenders. (a) All calenders, irrespective of size of the rolls or their configuration, shall be stopped within a distance, as measured in inches of surface travel, not greater than 1 3/4 percent of the peripheral no-load surface speeds of the respective calender rolls as determined in feet per minute.

(b) Where speeds above 250 feet per minute as measured on the surface of the drive roll are used, stopping distances of more than 1 3/4 percent are permissible. Such stopping distances shall be subject to engineering determination. [Order 73-5, § 296-24-19013, filed 5/9/73 and Order 73-4, § 296-24-19013, filed 5/7/73.]

WAC 296-24-19015 Alarm. Where an exposure is created by the operation, and the operators are not within sight or hearing of other employees, a suitable alarm device should be provided so that assistance will be available in case of accidents. [Order 73-5, § 296-24-19015, filed 5/9/73 and Order 73-4, § 296-24-19015, filed 5/7/73.]

WAC 296-24-195 Mechanical power presses. [Order 76-6, § 296-24-195, filed 3/1/76; Order 73-5, § 296-24-195, filed 5/9/73 and Order 73-4, § 296-24-195, filed 5/7/73.]

WAC 296-24-19501 Definitions. (1) "Antirepeat" means the part of the clutch/brake control system designed to limit the press to a single stroke if the tripping means is held operated. Antirepeat requires release of all tripping mechanisms before another stroke can be initiated. "Antirepeat" is also called single stroke reset or reset circuit.

(2) "Brake" means the mechanism used on a mechanical power press to stop and/or hold the crankshaft, either directly or through a gear train, when the clutch is disengaged.

(3) "Bolster plate" means the plate attached to the top of the bed of the press having drilled holes or T-slots for attaching the lower die or die shoe.

(4) "Clutch" means the coupling mechanism used on a mechanical power press to couple the flywheel to the crankshaft, either directly or through a gear train.

(5) "Full revolution clutch" means a type of clutch that, when tripped, cannot be disengaged until the crankshaft has completed a full revolution and the press slide a full stroke.

(6) "Part revolution clutch" means a type of clutch that can be disengaged at any point before the crankshaft has completed a full revolution and the press slide a full stroke.

(7) "Direct drive" means the type of driving arrangement wherein no clutch is used; coupling and decoupling of the driving torque is accomplished by energization and deenergization of a motor. Even though not employing a clutch, direct drives match the operational characteristics of "part revolution clutches" because the driving power may be disengaged during the stroke of the press.

(8) "Concurrent" means acting in conjunction, and is used to describe a situation wherein two or more controls exist in an operated condition at the same time.

(9) "Continuous" means uninterrupted multiple strokes of the slide without intervening stops (or other clutch control action) at the end of individual strokes.

(10) "Counterbalance" means the mechanism that is used to balance or support the weight of the connecting rods, slide, and slide attachments.

(11) "Device" means a press control or attachment that:

(a) Restrains the operator from inadvertently reaching into the point of operation, or

(b) Prevents normal press operation if the operator's hands are inadvertently within the point of operation, or

(c) Automatically withdraws the operator's hands if the operator's hands are inadvertently within the point of operation as the dies close.

(12) "Presence sensing device" means a device designed, constructed and arranged to create a sensing field or area and deactivate the clutch control of the press when an operator's hand or any other parts of his body is within such field or area.

(13) "Gate or movable barrier device" means a movable barrier arranged to enclose the point of operation before the press stroke can be started.

(14) "Holdout or restraint device" means a mechanism, including attachments for operator's hands, that when anchored and adjusted prevent the operator's hands from entering the point of operation.

(15) "Pull-out device" means a mechanism attached to the operator's hands and connected to the upper die or slide of the press, that is designed, when properly adjusted, to withdraw the operator's hands as the dies close, if the operator's hands are inadvertently within the point of operation.

(16) "Sweep device" means a single or double arm (rod) attached to the upper die or slide of the press and designed to move the operator's hands to a safe position as the dies close, if the operator's hands are inadvertently within the point of operation.

(17) "Two hand control device" means a two hand trip that further requires concurrent pressure from both hands of the operator during a substantial part of the die-closing portion of the stroke of the press.

(18) "Die" means the tooling used in a press for cutting or forming material. An upper and a lower die make a complete set.

(19) "Die builder" means any person who builds dies for power presses.

(20) "Die set" means a tool holder held in alignment by guide posts and bushings and consisting of a lower shoe, an upper shoe or punch holder, and guide posts and bushings.

(21) "Die setter" means an individual who places or removes dies in or from mechanical power presses, and who, as a part of his duties, makes the necessary adjustments to cause the tooling to function properly and safely.

(22) "Die setting" means the process of placing or removing dies in or from a mechanical power press, and the process of adjusting the dies, other tooling and safeguarding means to cause them to function properly and safely.

(23) "Die shoe" means a plate or block upon which a die holder is mounted. A die shoe functions primarily as a base for the complete die assembly, and, when used, is bolted or clamped to the bolster plate or the face of slide.

(24) "Ejector" means a mechanism for removing work or material from between the dies.

(25) "Face of slide" means the bottom surface of the slide to which the punch or upper die is generally attached.

(26) "Feeding" means the process of placing or removing material within or from the point of operation.

(27) "Automatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by a method or means not requiring action by an operator on each stroke of the press.

(28) "Semiautomatic feeding" means feeding wherein the material or part being processed is placed within or removed from the point of operation by an auxiliary means controlled by operator on each stroke of the press.

(29) "Manual feeding" means feeding wherein the material or part being processed is handled by the operator on each stroke of the press.

(30) "Foot control" means the foot operated control mechanism designed to be used with a clutch or clutch/brake control system.

(31) "Foot pedal" means the foot operated lever designed to operate the mechanical linkage that trips a full revolution clutch.

(32) "Guard" means a barrier that prevents entry of the operator's hands or fingers into the point of operation.

(33) "Die enclosure guard" means an enclosure attached to the die shoe or stripper, or both, in a fixed position.

(34) "fixed barrier guard" means a die space barrier attached to the press frame.

(35) "Interlocked press barrier guard" means a barrier attached to the press frame and interlocked so that the press stroke cannot be started normally unless the guard itself, or its hinged or movable sections, enclose the point of operation.

(36) "Adjustable barrier guard" means a barrier requiring adjustment for each job or die setup.

(37) "Guide post" means the pin attached to the upper or lower die shoe, operating within the bushing on the opposing die shoe, to maintain the alignment of the upper and lower dies.

(38) "Hand feeding tool" means any hand held tool designed for placing or removing material or parts to be processed within or from the point of operation.

(39) "Inch" means an intermittent motion imparted to the slide (on machines using part revolution clutches) by momentary operation of the "Inch" operating means. Operation of the "Inch" operating means engages the driving clutch so that a small portion of one stroke or indefinite stroking can occur, depending upon the length of time the "Inch" operating means is held operated. "Inch" is a function used by the die setter for setup of dies and tooling, but is not intended for use during production operations by the operator.

(40) "Jog" means an intermittent motion imparted to the slide by momentary operation of the drive motor, after the clutch is engaged with the flywheel at rest.

(41) "Knockout" means a mechanism for releasing material from either die.

(42) "Liftout" means the mechanism also known as knockout.

(43) "Operator's station" means the complete complement of controls used by or available to an operator on a given operation for stroking the press.

(44) "Pinch point" means any point other than the point of operation at which it is possible for a part of the

body to be caught between the moving parts of a press or auxiliary equipment, or between moving and stationary parts of a press or auxiliary equipment or between the material and moving part or parts of the press or auxiliary equipment.

(45) "Point of operation" means the area of the press where material is actually positioned and work is being performed during any process such as shearing, punching, forming, or assembling.

(46) "Press" means a mechanically powered machine that shears, punches, forms or assembles metal or other material by means of cutting, shaping, or combination dies attached to slides. A press consists of a stationary bed or anvil, and a slide (or slides) having a controlled reciprocating motion toward and away from the bed surface, the slide being guided in a definite path by the frame of the press.

(47) "Repeat" means an unintended or unexpected successive stroke of the press resulting from a malfunction.

(48) "Safety block" means a prop that, when inserted between the upper and lower dies or between the bolster plate and the face of the slide, prevents the slide from falling of its own deadweight.

(49) "Single stroke" means one complete stroke of the slide, usually initiated from a full open (or up) position, followed by closing, (or down), and then a return to the full open position.

(50) "Single stroke mechanism" means an arrangement used on a full revolution clutch to limit the travel of the slide to one complete stroke at each engagement of the clutch.

(51) "Slide" means the main reciprocating press member. A slide is also called a ram, plunger, or platen.

(52) "Stop control" means an operator control designed to immediately deactivate the clutch control and activate the brake to stop slide motion.

(53) "Stripper" means a mechanism or die part for removing the parts or material from the punch.

(54) "Stroking selector" means the part of the clutch/brake control that determines the type of stroking when the operating means is actuated. The stroking selector generally includes positions for "Off" (Clutch Control), "Inch", "Single Stroke", and "Continuous" (when continuous is furnished).

(55) "Trip or (tripping)" means activation of the clutch to "run" the press.

(56) "Turnover bar" means a bar used in die setting to manually turn the crankshaft of the press.

(57) "Two-hand trip" means a clutch actuating means requiring the concurrent use of both hands of the operator to trip the press.

(58) "Unitized tooling" means a type of die in which the upper and lower members are incorporated into a self-contained unit so arranged as to hold the die members in alignment.

(59) "Control system" means sensors, manual input and mode selection elements, interlocking and decision-making circuitry, and output elements to the press operating mechanism.

(60) "Brake monitor" means a sensor designed, constructed, and arranged to monitor the effectiveness of

the press braking system. [Order 76-6, § 296-24-19501, filed 3/1/76; Order 73-5, § 296-24-19501, filed 5/9/73 and Order 73-4, § 296-24-19501, filed 5/7/73.]

WAC 296-24-19503 General requirements. (1) New installations. The requirements of this section shall apply to all mechanical power presses installed on or after August 31, 1971, except that the requirements of subsections 19505(13), (14) and 19507(5) of WAC 296-24-195 shall be complied with by November 1, 1975.

(2) Former Installations. The requirements of this section shall apply to all mechanical power presses installed prior to August 31, 1971, except that the requirements of section 19505 and 19507 of WAC 296-24-195 shall be complied with by November 1, 1975.

(3) All Installations. The requirements of this section pertaining to the care and use of mechanical power presses shall apply to all mechanical power press operations as of February 15, 1972.

(4) Reconstruction and Modification. It shall be the responsibility of any person reconstructing, or modifying a mechanical power press to do so in accordance with WAC 296-24-19505.

(5) Excluded Machines. Press brakes, hydraulic and pneumatic power presses, bulldozers, hot bending and hot metal presses, forging presses and hammers, riveting machines and similar types of fastener applicators are excluded from the requirements of this section. [Order 76-6, § 296-24-19503, filed 3/1/76; Order 73-5, § 296-24-19503, filed 5/9/73 and Order 73-4, § 296-24-19503, filed 5/7/73.]

WAC 296-24-19505 Mechanical power press guarding and construction, general. (1) Hazards to Personnel Associated with Broken or Falling Machine Components. Machine components shall be designed, secured, or covered to minimize hazards caused by breakage, or loosening and falling or release of mechanical energy (i.e. broken springs).

(2) Brakes. Friction brakes provided for stopping or holding a slide movement shall be inherently self-engaging by requiring power or force from an external source to cause disengagement; brake capacity shall be sufficient to stop the motion of the slide quickly and capable of holding the slide and its attachments at any point in its travel.

(3) Machines Using Full Revolution Positive Clutches. (a) Machines using full revolution clutches shall incorporate a single-stroke mechanism.

(b) If the single-stroke mechanism is dependent upon spring action, the spring(s) shall be of the compression type, operating on a rod or guided within a hole or tube, and designed to prevent interleaving of the spring coils in event of breakage.

(4) Foot Pedals (treadle). (a) The pedal mechanism shall be protected to prevent unintended operation from falling or moving objects or by accidental stepping onto the pedal.

(b) A pad with a nonslip contact area shall be firmly attached to the pedal.

(c) The pedal return spring(s) 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.

(d) If pedal counterweights are provided, the path of the travel of the weight shall be enclosed.

(5) Hand Operated Levers. (a) Hand-lever-operated power presses shall be equipped with a spring latch on the operating lever to prevent premature or accidental tripping.

(b) The operating levers on hand-tripped presses having more than one operating station shall be interlocked to prevent the tripping of the press except by the "concurrent" use of all levers.

(6) Two-hand Trip. (a) A two-hand trip shall have the individual operator's hand controls protected against unintentional operation and have the individual operator's hand controls arranged by design and construction and/or separation to require the use of both hands to trip the press and use a control arrangement requiring concurrent operation of the individual operator's hand controls.

(b) Two-hand trip systems on full revolution clutch machines shall incorporate an antirepeat feature.

(c) If two-hand trip systems are used on multiple operator presses, each operator shall have a separate set of controls.

(7) Machines Using Part Revolution Clutches. (a) The clutch shall release and the brake shall be applied when the external clutch engaging means is removed, deactivated, or deenergized.

(b) A red color stop control shall be provided with the clutch/brake control system. Momentary operation of the stop control shall immediately deactivate the clutch and apply the brake. The stop control shall override any other control, and reactivation of the clutch shall require use of the operating (tripping) means which has been selected.

(c) A means of selecting Off, "Inch" Single Stroke, and "Continuous" (when the continuous function is furnished) shall be supplied with the clutch/brake control to select type of operation of the press. Fixing of selection shall be by means capable of supervision by the employer.

(d) The "Inch" operating means shall be designed to prevent exposure of the workers hands within the point of operation by:

(i) Requiring the concurrent use of both hands to actuate the clutch, or

(ii) Being a single control protected against accidental actuation and so located that the worker cannot reach into the point of operation while operating the single control.

(e) Two-hand controls for single stroke shall conform to the following requirements:

(i) Each hand control shall be protected against unintended operation and arranged by design, construction, and/or separation so that the concurrent use of both hands is required to trip the press.

(ii) The control system shall be designed to permit an adjustment which will require concurrent pressure from both hands during the die closing portion of the stroke.

(iii) The control system shall incorporate an antirepeat feature.

(iv) The control system shall be designed to require release of all operator's hand controls before an interrupted stroke can be resumed. This requirement pertains only to those single stroke two-hand controls manufactured and installed on or after August 31, 1971.

(f) [Reserved].

(g) Controls for more than one operating station shall be designed to be activated and deactivated in complete sets of two operator's hand controls per operating station by means capable of being supervised by the employer. The clutch/brake control system shall be designed and constructed to prevent actuation of the clutch if all operating stations are bypassed.

(h) Those clutch/brake control systems which contain both single and continuous functions shall be designed so that completion of continuous circuits may be supervised by the employer. The initiation of continuous run shall require a prior action or decision by the operator in addition to the selection of "Continuous" on the stroking selector, before actuation of the operating means will result in continuous stroking.

(i) If foot control is provided, the selection method between hand and foot control shall be separate from the stroking selector and shall be designed so that the selection may be supervised by the employer.

(j) Foot operated tripping controls, if used, shall be protected so as to prevent operation from falling or moving objects, or from unintended operation by accidental stepping onto the foot control.

(k) The control of air-clutch machines shall be designed to prevent a significant increase in the normal stopping time due to failure within the operating valve mechanism, and to inhibit further operation if such failure does occur. These requirements shall apply only to those clutch/brake air-valve controls manufactured and installed on or after August 31, 1971, but shall not apply to machines intended only for continuous automatic feeding applications.

(l) The clutch/brake control shall incorporate an automatic means to prevent initiation or continued activation of the Single Stroke or Continuous functions unless the press drive motor is energized and in the forward direction.

(m) The clutch/brake control shall automatically deactivate in event of failure of the power or pressure supply for the clutch engaging means. Reactivation of clutch shall require restoration of normal supply and the use of the tripping mechanism(s).

(n) The clutch/brake control shall automatically deactivate in event of failure of the counterbalance(s) air supply. Reactivation of the clutch shall require restoration of normal air supply and use of the tripping mechanism(s).

(o) Selection of bar operation shall be by means capable of being supervised by the employer. A separate pushbutton shall be employed to activate the clutch, and the clutch shall be activated only if the driver motor is deenergized.

(8) Electrical. (a) A main power disconnect switch capable of being locked only in the Off position shall be provided with every power press control system.

(b) The motor start button shall be protected against accidental operation.

(c) All mechanical power press controls shall incorporate a type of drive motor starter that will disconnect the drive motor from the power source in event of control voltage or power source failure, and require operation of the motor start button to restart the motor when voltage conditions are restored to normal.

(d) All a.c. control circuits and solenoid valve coils shall be powered by not more than a nominal 120-volt a.c. supply obtained from a transformer with an isolated secondary. Higher voltages that may be necessary for operation of machine or control mechanisms shall be isolated from any control mechanism handled by the operator, but motor starters with integral Start-Stop buttons may utilize line voltage cont. All d.c. control circuits shall be powered by not more than nominal 240-volt d.c. supply isolated from any higher voltages.

(e) All clutch/brake control electrical circuits shall be protected against the possibility of an accidental ground in the control circuit causing false operation of the press.

(f) Electrical clutch/brake control circuits shall incorporate features to minimize the possibility of an unintended stroke in event of the failure of a control component to function properly, including relays, limit switches, and static output circuits.

(9) Slide Counterbalance Systems. (a) Spring counterbalance systems when used shall incorporate means to retain system parts in event of breakage.

(b) Spring counterbalances when used shall have the capability to hold the slide and its attachments at mid-stroke, without brake applied.

(c) Air counterbalance cylinders shall incorporate means to retain the piston and rod in case of breakage or loosening.

(d) Air counterbalance cylinders shall have adequate capability to hold the slide and its attachments at any point in stroke, without brake applied.

(e) Air counterbalance cylinders shall incorporate means to prevent failure of capability (sudden loss of pressure) in event of air supply failure.

(10) Air Controlling Equipment. Air controlling equipment shall be protected against foreign material and water entering the pneumatic system of the press. A means of air lubrication shall be provided when needed.

(11) Hydraulic Equipment. The maximum anticipated working pressures in any hydraulic system on a mechanical power press shall not exceed the safe working pressure rating of any component used in that system.

(12) Pressure Vessels. All pressure vessels used in conjunction with power presses shall conform to the American Society of Mechanical Engineers Code for Pressure Vessels, 1968 Edition.

(13) Control Reliability. When required by subsection 19507(5) of WAC 296-24-195, the control system shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent initiation of a successive stroke until the failure is corrected.

The failure shall be detectable by a simple test, or indicated by the control system. This requirement does not apply to those elements of the control system which have no effect on the protection against point of operation injuries.

(14) Brake System Monitoring. When required by subsection 19507(5) of WAC 296-24-195, the brake monitor shall meet the following requirements:

(a) Be so constructed as to automatically prevent the activation of a successive stroke if the stopping time or braking distance deteriorates to a point where the safety distance being utilized does not meet the requirements set forth in item 19507(3)(c)(v) or 19507(3)(g)(iii) of this section. The brake monitor used with the Type B gate or movable barrier device shall be installed in a manner to detect slide top-stop overrun beyond the normal limit reasonably established by the employer.

(b) Be installed on a press such that it indicates when the performance of the braking system has deteriorated to the extent described in subdivision 19505(14)(a) of this section; and

(c) Be constructed and installed in a manner to monitor brake system performance on each stroke. [Order 76-6, § 296-24-19505, filed 3/1/76; Order 74-27, § 296-24-19505, filed 5/7/74; Order 73-5, § 296-24-19505, filed 5/9/73 and Order 73-4, § 296-24-19505, filed 5/7/73.]

WAC 296-24-19507 Safeguarding the point of operation.

(1) General Requirements. (a) It shall be the responsibility of the employer to provide and insure the usage of "point of operation guards" or properly applied and adjusted point of operation devices on every operation performed on a mechanical power press. See Table O-10.

(b) The requirement of subdivision (a) of this section shall not apply when the point of operation opening is one-fourth inch or less. See Table O-10.

TABLE O-10

MAXIMUM OPENINGS UNDER GUARDS

Distance of Opening From Point of Operation Hazard (Inches)	Maximum Openings Under Guard (Inches)
1/2 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 12-1/2	1-1/4
12-1/2 to 15-1/2	1-1/2
15-1/2 to 17-1/2	1-7/8
17-1/2 to 31-1/2	2-1/8

MAXIMUM OPENINGS THROUGH GUARDS

Material	Guard Clearance From Hazard Point	Largest Mesh or Opening (Inches)
Woven Wire, Expanded Metal or Perforated Metal	From 2 to 4 4 to 15	1/2 2
Wood or Metal Strips (Crossed)	From 2 to 4 4 to 15	3/8 2
Wood or metal Strips (Not Crossed)	From 2 to 4 4 to 15	1/2 width of strip 1 width of strip

NOTE: The specifications for the materials used for filling barrier, point of operation guards is contained in Table O-12, WAC 296-24-20531. When plastic is used as filling, it shall be 1/4 inch thick (Minimum).

(2) Point of Operation Guards. (a) Every point of operation guard shall meet the following design, construction, application and adjustment requirements:

(i) It shall prevent entry of hands or fingers into the point of operation by reaching through, over, under or around the guard;

(ii) It shall conform to the maximum permissible openings of Table O-10;

(iii) It shall, in itself, create no pinch point between the guard and moving machine parts;

(iv) It shall utilize fasteners not readily removable by operator, so as to minimize the possibility of misuse or removal of essential parts;

(v) It shall facilitate its inspection, and

(vi) If [It] shall offer maximum visibility of the point of operation consistent with other requirements.

(b) A die enclosure guard shall be attached to the die shoe or stripper in a fixed position.

(c) A fixed barrier guard shall be attached securely to the frame of the pressor to the bolster plate.

(d) An interlocked press barrier guard shall be attached to the press frame or bolster and shall be interlocked with the press clutch control so that the clutch cannot be activated unless the guard itself, or the hinged or movable sections of the guard are in position to conform to the requirements of Table O-10.

(e) The hinged or movable sections of an interlocked press barrier guard shall not be used for manual feeding. The guard shall prevent opening of the interlocked section and reaching into the point of operation prior to die closure or prior to the cessation of slide motion. See subdivision 19507(3)(b) of this section regarding manual feeding through interlocked press barrier devices.

(f) The adjustable barrier guard shall be securely attached to the press bed, bolster plate, or die shoe, and shall be adjusted and operated in conformity with Table O-10 and the requirements of this subsection. Adjustments shall be made only by authorized personnel whose qualifications include a knowledge of the provisions of Table O-10 and this subsection.

(g) A point of operation enclosure which does not meet the requirements of this subsection and Table O-10 shall be used only in conjunction with point of operation devices.

(3) Point of Operation Devices. (a) Point of operation devices shall protect the operator by:

(i) Preventing and/or stopping normal stroking of the press if the operator's hands are inadvertently placed in the point of operation; or

(ii) Preventing the operator from inadvertently reaching into the point of operation or withdrawing his hands if they are inadvertently located in the point of operation, as the dies close; or

(iii) Preventing the operator from inadvertently reaching into the point of operation at all times; or

(iv) [Reserved].

(v) Requiring application of both of the operator's hands to machine operating controls and locating such controls at such a safety distance from the point of operation that the slide completes the downward travel or stops before the operator can reach into the point of operation with his hands; or

(vi) Enclosing the point of operation before a press stroke can be initiated and maintaining this closed condition until the motion of the slide had ceased; or

(vii) Enclosing the point of operation before a press stroke can be initiated, so as to prevent an operator from reaching into the point of operation prior to die closure or prior to cessation of slide motion during the downward stroke.

(b) The gate or movable barrier device shall protect the operator as follows:

(i) A Type A gate or movable barrier device shall protect the operator in the manner specified in item 19507(3)(a)(vi) of this section.

(ii) A Type B gate or movable barrier device shall protect the operator in the manner specified in item 19507(3)(a)(vii) of this section.

(c) A presence sensing point of operation device shall protect the operator as provided in item 19507(3)(a)(i) of this section, and shall be interlocked into the control circuit to prevent or stop slide motion if the operator's hand or other part of his body is within the sensing field of the device during the downstroke of the press slide.

(i) The device may not be used on machines using full revolution clutches.

(ii) The device may not be used as a tripping means to initiate slide motion.

(iii) The device shall be constructed so that a failure within the system does not prevent the normal stopping action from being applied to the press when required, but does prevent the initiation of a successive stroke until the failure is corrected. The failure shall be indicated by the system.

(iv) Muting (bypassing of the protective function) of such device, during the upstroke of the press slide, is permitted for the purpose of parts ejection, circuit checking, and feeding.

(v) The safety distance (Ds) from the sensing field to the point of operation shall be greater than the distance determined by the following formula:

$$D_s = 63 \text{ inches/second} \times T_s \text{ where:}$$

D_s = minimum safety distance (inches);
 63 inches/second = hand speed constant; and
 T_s = stopping time of the press measured at approximately 90° position of crankshaft rotation (seconds).

(vi) Guards shall be used to protect all areas of entry to the point of operation not protected by the presence sensing device.

(d) The pull-out device shall protect the operator as specified in item 19507(3)(a)(ii) of this section and shall include attachments for each of the operator's hands.

(i) Attachments shall be connected to and operated only by the press slide or upper die.

(ii) Attachment shall be adjusted to prevent the operator from reaching into the point of operation or to withdraw the operator's hands from the point of operation before the dies close.

(iii) A separate pull-out device shall be provided for each operator if more than one operator is used on a press.

(iv) Each pull-out device in use shall be visually inspected and checked for proper adjustment at the start of each operator shift, following a new die set-up, and when operators are changed. Necessary maintenance or repair or both shall be performed and completed before the press is operated. Records of inspections and maintenance shall be kept in accordance with WAC 296-24-19511.

(e) The sweep device, shall protect the operator as specified in item 19507(3)(a)(ii) of this section, by removing his hands safely to a safe position if they are inadvertently located in the point of operation, as the dies close or prior to tripping the clutch. Devices operating in this manner shall have a barrier, attached to the sweep arm in such a manner as to prevent the operator from reaching into the point of operation, past the trailing edge of the sweep arm on the downward stroke of the press. This device may not be used for point of operation safeguarding after December 31, 1976.

(i) The sweep device must be activated by the slide or by motion of a foot pedal tripod.

(ii) The sweep device must be designed, installed and operated so as to prevent the operator from reaching into the point of operation before the dies close.

(iii) The sweep device must be installed so that it will not itself create an impact or shear hazard between the sweep arm and the press tie rods, dies, or any other part of the press or barrier.

(iv) Partial enclosure conforming with this subdivision 19507(3)(e), as to the area of entry which they protect, must be provided on both sides of the point of operation to prevent the operator from reaching around or behind the sweep device and into the point of operation after the dies start to close. Partial enclosures shall not themselves create a pinch point or shear hazard.

(f) A holdout or a restraint device shall protect the operator as specified in item (3)(a)(iii) of this section and shall include attachments for each of the operator's hands. Such attachments shall be securely anchored and adjusted in such a way that the operator is restrained from reaching into the point of operation. A separate set of restraints shall be provided for each operator if more than one operator is required on a press.

(g) The two hand control device shall protect the operator as specified in item 19507(3)(a)(v) of this section.

(i) When used in press operations requiring more than one operator, separate two hand controls shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide. The removal of a hand from any control button shall cause the slide to stop.

(ii) Each two hand control shall meet the construction requirements of subdivision 19505(7)(e) of this section.

(iii) The safety distance (Ds) between each two hand control device and the point of operation shall be greater than the distance determined by the following formula:

$$D_s = 63 \text{ inches/second} \times T_s \text{ where:}$$

D_s = minimum safety distance (inches);
 63 inches/second = hand speed constant; and
 T_s = stopping time of the press measured at approximately 90° position of crankshaft rotation (seconds).

(iv) Two hand control shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(h) The two hand trip device shall protect the operator as specified in item 19507(3)(a)(v) of this section.

(i) When used in press operations requiring more than one operator, separate two hand trips shall be provided for each operator, and shall be designed to require concurrent application of all operators' controls to activate the slide.

(ii) Each two hand trip shall meet the construction requirements of subsection 19505(6) of this section.

(iii) The safety distance (Dm) between the two hand trip and the point of operation shall be greater than the distance determined by the following formula:

$$D_m = 63 \text{ inches/second} \times T_m \text{ where:}$$

D_m = minimum safety distance (inches);
 63 inches/second = hand speed constant; and
 T_m = the maximum time the press takes for the die closure after it has been tripped (seconds). For full revolution clutch presses with only one engaging point T_m is equal to the time necessary for one and one-half revolutions of the crankshaft. For full revolution clutch presses with more than one engaging point, T_m shall be calculated as follows:

$$T_m = \left\{ \frac{1}{2} + \frac{1}{\text{Number of engaging points per revolution}} \right\} \times \text{time necessary to complete one revolution of the crankshaft (seconds)}$$

(iv) Two hand trips shall be fixed in position so that only a supervisor or safety engineer is capable of relocating the controls.

(i) [Reserved].

(4) Hand Feeding Tools. Hand feeding tools are intended for placing and removing materials in and from

the press. Hand feeding tools are not a point of operation guard or protection device and shall not be used in lieu of the "guards" or devices required in this section.

(5) Additional Requirements for Safequarding. Where the operator feeds or removes parts by placing one or both hands in the point of operation, and a two hand control, presence sensing device of Type B gate or movable barrier (on a part revolution clutch) is used for safequarding:

(i) The employer shall use a control system and a brake monitor which comply with subsections 19505(13) and (14) of this section. This requirement shall be complied with by November 1, 1975;

(ii) The exception in item 19505(7)(e)(iv) of this section for two hand controls manufactured and installed before August 31, 1971, is not applicable under this subsection 19507(5);

(iii) The control of air clutch machines shall be designed to prevent a significant increase in the normal stopping time due to a failure within the operating valve mechanism, and to inhibit further operation if such failure does occur, where a part revolution clutch is employed. The exception in subdivision 19505(7)(k) of this section for controls manufactured and installed before August 31, 1971, is not applicable under this subsection 19507(5). [Order 76-6, § 296-24-19507, filed 3/1/76; Order 73-5, § 296-24-19507, filed 5/9/73 and Order 73-4, § 296-24-19507, filed 5/7/73.]

WAC 296-24-19509 Design, construction, setting and feeding of dies. (1) General Requirements. Effective February 1, 1975, the employer shall:

(a) Use dies and operating methods designed to control or eliminate hazards to operating personnel, and

(b) Furnish and enforce the use of hand tools for freeing and removing stuck work or scrap pieces from the die, so that no employee need reach into the point of operation for such purposes.

(2) [Reserved].

(3) Scrap Handling. The employer shall provide means for handling scrap from roll feed or random length stock operations. Scrap cutters used in conjunction with scrap handling systems shall be safeguarded in accordance with section 19505 and with WAC 296-24-205, Mechanical Power-Transmission Apparatus.

(4) Guide Post Hazard. The hazard created by a guide post (when it is located in the immediate vicinity of the operator) when separated from its bushing by more than one-fourth inch shall be considered as a point of operation hazard and be protected in accordance with section 19507.

(5) Unitized Tooling. If unitized tooling is used, the opening between the top of the punch holder and the face of the slide, or striking pad, shall be safeguarded in accordance with the requirements of section 19505.

(6) Tonnage, Stroke and Weight Designation. All dies shall be:

(a) Stamped with the tonnage and stroke requirements, or have these characteristics recorded if these records are readily available to the die setter;

(b) Stamped to indicate upper die weight when necessary for air counterbalance pressure adjustment; and

(c) Stamped to indicate complete die weight when handling equipment may become overloaded.

(7) Die Fastening. Provision shall be made in both the upper and lower shoes for securely mounting the die to the bolster and slide. Where clamp caps or setscrews are used in conjunction with punch stems, additional means of securing the upper shoe to the slide shall be used.

(8) Die Handling. Handling equipment attach points shall be provided on all dies requiring mechanical handling.

(9) Diesetting. (a) The employer shall establish a diesetting procedure that will insure compliance with section 19505.

(b) The employer shall provide spring loaded turnover bars, for presses designed to accept such turnover bars.

(c) The employer shall provide die stops or other means to prevent losing control of the die while setting or removing dies in presses which are inclined.

(d) The employer shall provide and enforce the use of safety blocks for use whenever dies are being adjusted or repaired in the press.

(e) The employer shall provide brushes, swabs, lubricating rolls and automatic or manual pressure guns so that operators and diesetters shall not be required to reach into the point of operation or other hazard areas to lubricate material, punches or dies. [Order 76-6, § 296-24-19509, filed 3/1/76; Order 73-5, § 296-24-19509, filed 5/9/73 and Order 73-4, § 296-24-19509, filed 5/7/73.]

WAC 296-24-19511 Inspection, maintenance and modification of presses. (1) Inspection and Maintenance Records. (a) It shall be the responsibility of the employer to establish and follow a program of periodic and regular inspections of his power presses to insure that all their parts, auxiliary equipment and safeguards are in a safe operating condition and adjustment. The employer shall maintain records of these inspections and the maintenance work performed.

(b) Each press shall be inspected and tested no less than weekly to determine the condition of the clutch/brake mechanism, anti-repeat feature and single stroke mechanism. Necessary maintenance or repair or both shall be performed and completed before the press is operated. The employer shall maintain records of these inspections and the maintenance work performed. These requirements do not apply to those presses which comply with subsections 19505(13) and (14).

(2) Modification. It shall be the responsibility of any person modifying a power press to furnish instructions with the modification to establish new or changed guidelines for use and care of the power press so modified.

(3) Training of Maintenance Personnel. It shall be the responsibility of the employer to insure the original and continuing competence of personnel caring for, inspecting and maintaining power presses. [Order 76-6, § 296-24-19511, filed 3/1/76; Order 73-5, § 296-24-19511, filed 5/9/73 and Order 73-4, § 296-24-19511, filed 5/7/73.]

WAC 296-24-19513 Operation of power presses.

(1) Employment of minors. The employer shall permit no one under 18 years of age to operate or assist in the operation of machinery covered in this section, except that this section shall not be deemed to prohibit the employment of persons who are 16 or 17 years of age in an apprenticeship training program which meets the requirements contained in chapter 49.04 RCW, Apprenticeship.

(2) Instruction to Operators. The employer shall train and instruct the operator in the safe method of work before starting work on any operation covered by this section. The employer shall insure by adequate supervision that correct operating procedures are being followed.

(3) Work Area. The employer shall provide clearance between machines so that movement of one operator will not interfere with the work of another. Ample room for cleaning machines, handling material, work pieces, and scrap shall also be provided. All surrounding floors shall be kept in good condition and free from obstructions, grease, oil and water.

(4) Overloading. The employer shall operate his presses within the tonnage and attachment weight ratings specified by the manufacturer. [Order 76-6, § 296-24-19513, filed 3/1/76; Order 73-5, § 296-24-19513, filed 5/9/73 and Order 73-4, § 296-24-19513, filed 5/7/73.]

WAC 296-24-19515 Reports of point of operation injuries—Mechanical power presses. The employer shall report some types of accidents associated with mechanical power presses. Such accidents shall include those that involve injuries to body parts caught in the point of operation or other pinch points on power presses and those that involve malfunction of safeguards or actuating controls but do not cause injury. Such report shall not in itself incite citations and shall be used for statistical purposes only. The report shall be sent to the Chief of Research and Statistics, Division of Industrial Safety and Health, Department of Labor and Industries, P.O. Box 207, Olympia, Washington 98504. The following information shall be included in the report:

(1) Employer's name, address and location of the workplace (establishment).

(2) Employee's name, injury sustained, and the task being performed (operation, setup, maintenance or other).

(3) Type of clutch used on the press (full revolution, part revolution, or direct drive).

(4) Type of safeguard(s) being used (two hand control, two hand trip, pull-outs, sweeps or other). If the safeguard is not described in this section, give a complete description.

(5) Cause of the accident (repeat of press, safeguard failure, removing stuck part or scrap, no safeguard provided, no safeguard in use, or other).

(6) Type of feeding (manual with hands in dies or with hands out of dies, semi-automatic, automatic, or other).

(7) Means used to actuate press stroke (foot trip, foot control, hand trip, hand control, or other).

(8) Number of operators required for the operation and the number of operators provided with controls and safeguards. [Order 76-6, § 296-24-19515, filed 3/1/76.]

WAC 296-24-197 Compactors. General Requirements. An antirepeat device shall be installed on compactors which will prohibit the compacting of material while the gate or door is raised or open. When adjustments or clearing of jams are necessary, means shall be provided for locking out the control energy. [Order 74-27, § 296-24-197, filed 5/7/74.]

WAC 296-24-200 Forging machines. [Order 73-5, § 296-24-200, filed 5/9/73 and Order 73-4, § 296-24-200, filed 5/7/73.]

WAC 296-24-20001 Definitions. (1) "Forging" means the product of work on metal formed to a desired shape by impact or pressure in hammers, forging machines (upsetters), presses, rolls, and related forming equipment. Forging hammers, counterblow equipment and high-energy-rate forging machines impart impact to the workpiece, while most other types of forging equipment impart squeeze pressure in shaping the stock. Some metals can be forged at room temperature, but the majority of metals are made more plastic for forging by heating.

(2) "Open framehammers (or blacksmith hammers)" mean hammers used primarily for the shaping of forgings by means of impact with flat dies. Open frame hammers generally are so constructed that the anvil assembly is separate from the operating mechanism and machine supports; it rests on its own independent foundation. Certain exceptions are forging hammers made with frame mounted on the anvil, e.g., the smaller, single-frame hammers are usually made with the anvil and frame in one piece.

(3) "Steam hammers" mean a type of drop hammer where the ram is raised for each stroke by a double-action steam cylinder and the energy delivered to the workpiece is supplied by the velocity and weight of the ram and attached upper die driven downward by steam pressure. Energy delivered during each stroke may be varied.

(4) "Gravity hammers" mean a class of forging hammer wherein energy for forging is obtained by the mass and velocity of a freely falling ram and the attached upper die. Examples: Board hammers and air-lift hammers.

(5) "Forging presses" mean a class of forging equipment wherein the shaping of metal between dies is performed by mechanical or hydraulic pressure, and usually is accomplished with a single workstroke of the press for each die station.

(6) "Trimming presses" mean a class of auxiliary forging equipment which removes flash or excess metal from a forging. This trimming operation can also be done cold, as can coining, a product sizing operation.

(7) "High-energy-rate forging machines" mean a class of forging equipment wherein high ram velocities

resulting from the sudden release of a compressed gas against a free piston impart impact to the workpiece.

(8) "Forging rolls" mean a class of auxiliary forging equipment wherein stock is shaped between power driven rolls bearing contoured dies. Usually used for preforming, roll forging is often employed to reduce thickness and increase length of stock.

(9) "Ring rolls" mean a class for forging equipment used for shaping weldless rings from pierced discs or thick-walled, ring-shaped blanks between rolls which control wall thickness, ring diameter, height and contour.

(10) "Bolt-headers" mean the same as an upsetter or forging machine except that the diameter of stock fed into the machine is much smaller, i.e., commonly three-fourths inch or less.

(11) "Rivet making machines" mean the same as up-setters and bolt-headers when producing rivets with stock diameter of 1-inch or more. Rivet making with less than 1-inch diameter is usually a cold forging operation, and therefore not included in WAC 296-24-200 through WAC 296-24-20021.

(12) "Upsetters (or forging machines, or headers)" means a type of forging equipment, related to the mechanical press, in which the main forming energy is applied horizontally to the workpiece which is gripped and held by prior action of the dies. [Order 73-5, § 296-24-20001, filed 5/9/73 and Order 73-4, § 296-24-20001, filed 5/7/73.]

WAC 296-24-20003 General requirements. (1) Use of Lead. The safety requirements of this section apply to lead casts or other use of lead in the forge shop or die shop.

(a) Thermostatic control of heating elements shall be provided to maintain proper melting temperature and prevent overheating.

(b) Fixed or permanent lead pot installations shall be exhausted.

(c) Portable units shall be used only in areas where good, general room ventilation is provided as specified in the General Occupational Health Standards, chapter 296-62 WAC.

(d) Personal protective equipment (gloves, goggles, aprons, and other items) shall be worn.

(e) A covered container shall be provided to store dross skimmings.

(f) Equipment shall be kept clean, particularly from accumulations of yellow lead oxide.

(2) Inspection and Maintenance. It shall be the responsibility of the employer to maintain all forge shop equipment in a condition which will insure continued safe operation. This responsibility includes:

(a) Establishing periodic and regular maintenance safety checks and keeping records of these inspections.

(b) Scheduling and recording inspection of guards and point of operation protection devices at frequent and regular intervals.

(c) Training personnel for the proper inspection and maintenance of forging machinery and equipment.

(d) All overhead parts shall be fastened or protected in such a manner that they will not fly off or fall in event of failure.

(3) Hammers and Presses. (a) All hammers shall be positioned or installed in such a manner that they remain on or are anchored to foundations sufficient to support them.

(b) All presses shall be installed in such a manner that they remain where they are positioned or they are anchored to foundations sufficient to support them.

(c) Means shall be provided for disconnecting the power to the machine and for locking out or rendering cycling controls inoperable.

(d) The ram shall be blocked when dies are being changed or other work is being done on the hammer. Blocks or wedges shall be made of material the strength and construction of which should meet or exceed the specifications and dimensions shown in Table O-11.

(e) Tongs shall be of sufficient length to clear the body of the worker in case of kickback, and shall not have sharp handle ends. The worker should be instructed in the proper body position when using tongs. Tongs should be checked periodically to see that they remain at the proper hardness level for the job. When rings or equivalent devices for locking tongs are used they should be inspected periodically to insure safe condition.

(f) Oil swabs, or scale removers, or other devices to remove scale shall be provided. These devices shall be long enough to enable a man to reach the full length of the die without placing his hand or arm between the dies.

(g) Material handling equipment shall be of adequate strength, size, and dimension to handle diesetting operations safely.

(h) A scale guard of substantial construction shall be provided at the back of every hammer, so arranged as to stop flying scale.

(i) A scale guard of substantial construction shall be provided at the back of every press, so arranged as to stop flying scale. [Order 76-6, § 296-24-20003, filed 3/1/76; Order 73-5, § 296-24-20003, filed 5/9/73 and Order 73-4, § 296-24-20003, filed 5/7/73.]

WAC 296-24-20005 Hammers, general. (1) Keys. Die keys and shims shall be made from a grade of material that will not unduly crack or splinter, and should not project more than 2 inches in front and 4 inches in back of ram or die.

(2) Foot Operated Devices. All foot operated devices (i.e., treadles, pedals, bars, valves, and switches) shall be substantially and effectively protected from unintended operation. [Order 73-5, § 296-24-20005, filed 5/9/73 and Order 73-4, § 296-24-20005, filed 5/7/73.]

WAC 296-24-20007 Presses. All manually operated valves and switches shall be clearly identified and readily accessible. [Order 73-5, § 296-24-20007, filed 5/9/73 and Order 73-4, § 296-24-20007, filed 5/7/73.]

WAC 296-24-20009 Power-driven hammers. (1) Safety Cylinder Head. Every steam or airhammer shall

have a safety cylinder head to act as a cushion if the rod should break or pull out of the ram.

(2) Shutoff Valve. Steam hammers shall be provided with a quick closing emergency valve in the admission pipeline at a convenient location. This valve shall be closed and locked in the off position while the hammer is being adjusted, repaired, or serviced, or when the dies are being changed.

(3) Cylinder draining. Steam hammers shall be provided with a means of cylinder draining, such as a self-draining arrangement or a quick-acting drain cock.

(4) Pressure Pipes. Steam or air piping shall conform to the specifications of American National Standard ANSI B31.1.0-1967, Power Piping with Addenda, ANSI B31.1.06-1971. [Order 73-5, § 296-24-20009, filed 5/9/73 and Order 73-4, § 296-24-20009, filed 5/7/73.]

WAC 296-24-20011 Gravity hammers. (1) Air-lift Hammers. (a) Airlift hammers shall have a safety cylinder head as required in WAC 296-24-20009(1).

(b) Air-lift hammers shall have an air shutoff valve as required in WAC 296-24-20009(2) and should be conveniently located and distinctly marked for ease of identification.

(c) Air-lift hammers shall be provided with two drain cocks: one on main head cylinder, and one on clamp cylinder.

(d) Air piping shall conform to the specifications of the ANSI B31.1.0-1967, Power Piping with Addenda, ANSI B.31.1.06-1971.

(2) Board Drophammers. (a) A suitable enclosure shall be provided to prevent damaged or detached boards from falling. The board enclosure shall be securely fastened to the hammer.

(b) All major assemblies and fittings which can loosen and fall shall be properly secured in place. [Order 73-5, § 296-24-20011, filed 5/9/73 and Order 73-4, § 296-24-20011, filed 5/7/73.]

WAC 296-24-20013 Forging presses. (1) Mechanical Forging Presses. When dies are being changed or maintenance is being performed on the press, the following shall be accomplished:

(a) The power to the press shall be locked out.

(b) The flywheel shall be at rest.

(c) The ram shall be blocked with a material the strength of which shall meet or exceed the specifications or dimensions shown in Table O-11

(2) Hydraulic Forging Presses. When dies are being changed or maintenance is being performed on the press, the following shall be accomplished:

(a) The hydraulic pumps and power apparatus shall be locked out.

(b) The ram shall be blocked with a material the strength of which shall meet or exceed the specifications or dimensions shown in Table O-11. [Order 73-5, § 296-24-20013, filed 5/9/73 and Order 73-4, § 296-24-20013, filed 5/7/73.]

WAC 296-24-20015 Trimming presses. (1) Hot Trimming Presses. The requirements of WAC 296-24-20013(1) shall also apply to hot trimming presses.

(2) Cold Trimming Presses. Cold trimming presses shall be safeguarded in accordance with WAC 296-24-195 through WAC 296-24-19507. [Order 73-5, § 296-24-20015, filed 5/9/73 and Order 73-4, § 296-24-20015, filed 5/7/73.]

WAC 296-24-20017 Upsetters. (1) General Requirements. All upsetters shall be installed so that they remain on their supporting foundations.

(2) Lockouts. Upsetters shall be provided with a means for locking out the power at its entry point to the machine and rendering its cycling controls inoperable.

(3) Manually Operated Controls. All manually operated valves and switches shall be clearly identified and readily accessible.

(4) Tongs. Tongs shall be of sufficient length to clear the body of the worker in case of kickback, and shall not have sharp handle ends. The worker should be instructed in the proper body position when using tongs. Tongs should be checked periodically to see that they remain at the proper hardness level for the job. When rings or equivalent devices for locking tongs are used they should be inspected periodically to assure safe condition.

(5) Changing Dies. When dies are being changed, maintenance performed, or any work done on the machine, the power to the upsetter shall be locked out, and the flywheel shall be at rest. [Order 73-5, § 296-24-20017, filed 5/9/73 and Order 73-4, § 296-24-20017, filed 5/7/73.]

WAC 296-24-20019 Other forging equipment. (1) Boltheadings. The provisions of WAC 296-24-20017 shall apply to boltheadings.

(2) Rivet Making. The provisions of WAC 296-24-20017 shall apply to rivet making. [Order 73-5, § 296-24-20019, filed 5/9/73 and Order 73-4, § 296-24-20019, filed 5/7/73.]

WAC 296-24-20021 Other forge facility equipment.

(1) Billet Shears. A positive-type lockout device for disconnecting the power to the shear shall be provided.

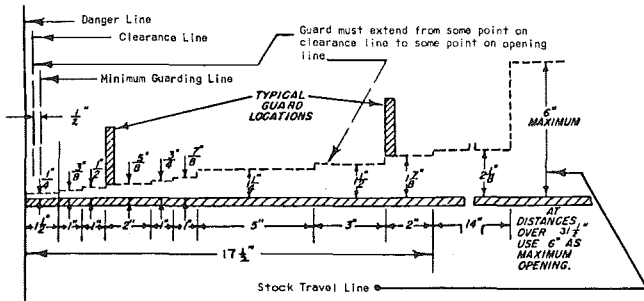
(2) Saws. Every saw shall be provided with a guard of not less than one-eighth inch sheet metal positioned to stop flying sparks. Suitable means should be provided to trap sparks below the saw. A tank of water placed below the saw is also desirable.

(3) Conveyors. Conveyor power transmission equipment shall be guarded in accordance with ANSI B20.1-1957, Safety Code for Conveyors, Cableways, and Related Equipment.

(4) Shot Blast. The cleaning chamber shall have doors or guards to protect operators.

(5) Grinding. Personal protective equipment shall be used in grinding operations, and equipment shall be used and maintained in accordance with ANSI B7.1-1970, Safety Code for the Use, Care, and Protection of Abrasive Wheels, and with WAC 296-24-180 through WAC 296-24-18009.

This table shows the distances that guards shall be positioned from the danger line in accordance with the required openings.



Explanation of above diagram:

This diagram shows the accepted safe openings between the bottom edge of a guard and feed table at various distances from the danger line (point of operation).

The "clearance line" marks the distance required to prevent contact between guard and moving parts.

The "minimum guarding line" is the distance between the infeed side of the guard and the danger line which is one-half inch from the danger line.

The various openings are such that for average size hands an operator's fingers won't reach the point of operation.

After installation of point of operation guards and before a job is released for operation a check should be made to verify that the guard will prevent the operator's hands from reaching the point of operation.

TABLE O-11

STRENGTH AND DIMENSIONS FOR WOOD RAM PROPS

Size of timber inches	Square inches in cross section	Minimum allowable crushing strength parallel to grain, p.s.i. ²	Maximum static load within short column range ³	Safety factor	Maximum recommended weight of forging hammer for timber used	Maximum allowable length of timber, inches
4 x 4	16	5,000	80,000	10	8,000	44
6 x 6	36	5,000	180,000	10	18,000	66
8 x 8	64	5,000	320,000	10	32,000	88
10 x 10	100	5,000	500,000	10	50,000	100
12 x 12	144	5,000	720,000	10	72,000	132

¹Actual dimension.

²Adapted from U.S. Department of Agriculture Technical Bulletin 479. Hardwoods recommended are those whose ultimate crushing strengths in compression parallel to grain are 5,000 p.s.i. (pounds per square inch) or greater.

³Slenderness ratio formula for short columns is $L/d=11$, where L =length of timber in inches and d =least dimension in inches; this ratio should not exceed 11.

[Order 73-5, § 296-24-20021, filed 5/9/73 and Order 73-4, § 296-24-20021, filed 5/7/73.]

WAC 296-24-205 Mechanical power-transmission apparatus. [Order 73-5, § 296-24-205, filed 5/9/73 and Order 73-4, § 296-24-205, filed 5/7/73.]

WAC 296-24-20501 Definitions. (1) "Belts" include all power transmission belts, such as flat belts, round belts, V-belts, etc., unless otherwise specified.

(2) "Belt shifter" means a device for mechanically shifting belts from tight to loose pulleys or vice versa, or for shifting belts on cones of speed pulleys.

(3) "Belt pole" (sometimes called a "belt shipper" or "shipper pole") means a device used in shifting belts on and off fixed pulleys on line or countershaft where there are no loose pulleys.

(4) "Exposed to contact" means that the location of an object is such that a person is likely to come into contact with it and be injured.

(5) "Flywheels" include flywheels, balance wheels, and flywheel pulleys mounted and revolving on crankshaft of engine or other shafting.

(6) "Maintenance runway" means any permanent runway or platform used for oiling, maintenance, running adjustment, or repair work, but not for passageway.

(7) "Nip-point belt and pulley guard" means a device which encloses the pulley and is provided with rounded or rolled edge slots through which the belt passes.

(8) "Point of operation" means that point at which cutting shaping, or forming is accomplished upon the stock and shall include such other points as may offer a hazard to the operator in inserting or manipulating the stock in the operation of the machine.

(9) "Prime movers" include steam, gas, oil, and air engines, motors, steam and hydraulic turbines, and other equipment used as a source of power.

(10) "Sheaves" mean grooved pulleys and shall be so classified unless used as flywheels. [Order 73-5, § 296-24-20501, filed 5/9/73 and Order 73-4, § 296-24-20501, filed 5/7/73.]

WAC 296-24-20503 General requirements. (1) This section covers all types and shapes of power-transmission belts, except the following when operating at two hundred and fifty (250) feet per minute or less:

(a) Flat belts one (1) inch or less in width.

(b) Flat belts two (2) inches or less in width which are free from metal lacings or fasteners.

(c) Round belts one-half (1/2) inch or less in diameter.

(d) Single strand V-belts, the width of which is thirteen thirty-seconds (13/32) inch or less.

(2) Vertical and inclined belts (WAC 296-24-20511(3) and (4)) if not more than two and one-half (2 1/2) inches wide and running at a speed of less than one thousand (1,000) feet per minute, and if free from metal lacings or fastenings may be guarded with a nip-point belt and pulley guard.

(3) For the Textile Industry, because of the presence of excessive deposits of lint, which constitute a serious fire hazard, the sides and face sections only of nip-point belt and pulley guards are required, provided the guard shall extend at least six (6) inches beyond the rim of the pulley on the in-running and off-running sides of the belt and at least two (2) inches away from the rim and face of the pulley in all other directions.

(4) These standards cover the principal features with which power transmission safeguards shall comply. [Order 73-5, § 296-24-20503, filed 5/9/73 and Order 73-4, § 296-24-20503, filed 5/7/73.]

WAC 296-24-20505 Prime-mover guards. (1) Flywheels. Flywheels located so that any part is seven (7) feet or less above floor or platform shall be guarded in accordance with the requirements of this section:

(a) With an enclosure of sheet, perforated, or expanded metal, or woven wire;

(b) With guard rails placed not less than fifteen (15) inches nor more than twenty (20) inches from rim. When flywheel extends into pit or is within 12 inches of floor, a standard toeboard shall also be provided;

(c) When the upper rim of flywheel protrudes through a working floor, it shall be entirely enclosed or surrounded by a guardrail and toeboard.

(d) For flywheels with smooth rims five (5) feet or less in diameter, where the preceding methods cannot be applied, the following may be used: A disk attached to the flywheel in such manner as to cover the spokes of the wheel on the exposed side and present a smooth surface and edge, at the same time providing means for periodic inspection. An open space, not exceeding four (4) inches in width, may be left between the outside edge of the disk and the rim of the wheel if desired, to facilitate turning the wheel over. Where a disk is used, the keys or other dangerous projections not covered by disk shall be cut off or covered. This subdivision does not apply to flywheels with solid web centers;

(e) Adjustable guard to be used for starting engine or for running adjustment may be provided at the flywheel of gas or oil engines. A slot opening for jack bar will be permitted;

(f) Wherever flywheels are above working areas, guards shall be installed having sufficient strength to hold the weight of the flywheel in the event of a shaft or wheel mounting failure.

(2) Cranks and Connecting Rods. Cranks and connecting rods, when exposed to contact shall be guarded in accordance with WAC 296-24-20527 and WAC 296-24-20529, or by a guardrail as described in WAC 296-24-20531(5).

(3) Tail Rods or Extension Piston Rods. Tail rods or extension piston rods shall be guarded in accordance with WAC 296-24-20527 and WAC 296-24-20529, or by a guardrail on sides and end, with a clearance of not less than fifteen (15) nor more than twenty (20) inches when rod is fully extended.

(4) Governor Balls. Governor Balls six (6) feet or less from the floor or other working level, when exposed to contact, shall be provided with an enclosure extending to

the top of the governor balls when at their highest position. The material used in the construction of this enclosure shall conform to WAC 296-24-20525 and WAC 296-24-20529. [Order 73-5, § 296-24-20505, filed 5/9/73 and Order 73-4, § 296-24-20505, filed 5/7/73.]

WAC 296-24-20507 Shafting. (1) Installation. (a) Each continuous line of shafting shall be secured in position against excessive endwise movement.

(b) Inclines and vertical shafts, particularly inclined idler shafts, shall be securely held in position against endwise thrust.

(2) Guarding Horizontal Shafting. (a) All exposed parts of horizontal shafting seven (7) feet or less from floor or working platform excepting runways used exclusively for oiling, or running adjustments, shall be protected by a stationary casing enclosing shafting completely or by a trough enclosing sides and top or sides and bottom of shafting as location requires.

(b) Shafting under bench machines shall be enclosed by a stationary casing, or by a trough at sides and top or sides and bottom, as location requires. The sides of the trough shall come within at least six (6) inches of the under side of table, or if shafting is located near floor within six (6) inches of floor. In every case the sides of trough shall extend at least two (2) inches beyond the shafting or protuberance.

(3) Guarding Vertical and Inclines Shafting. Vertical and inclines shafting seven (7) feet or less from floor or working platform, excepting maintenance runways, shall be enclosed with a stationary casing in accordance with requirements of WAC 296-24-20527 and WAC 296-24-20531.

(4) Projecting Shaft Ends. (a) Projecting shaft ends shall present a smooth edge and end and shall not project more than one-half the diameter of the shaft unless guarded by nonrotating caps or safety sleeves.

(b) Unused keyways shall be filled up or covered.

(5) Power-transmission Apparatus Located in Basements. All mechanical power transmission apparatus located in basements, towers, and rooms used exclusively for power transmission equipment shall be guarded in accordance with this section, except that the requirements for safeguarding belts, pulleys, and shafting need not be complied with when the following requirements are met:

(a) The basement, tower, or room occupied by transmission equipment is locked against unauthorized entrance.

(b) The vertical clearance in passageways between the floor and power transmission beams, ceiling, or any other objects, is not less than five feet six inches (5 ft. 6 in.).

(c) The intensity of illumination conforms to the requirements of ANSI A11.1-1965 (R-1970).

(d) The footing is dry, firm, and level.

(e) The route followed by the oiler is protected in such manner as to prevent accident. [Order 73-5, § 296-24-20507, filed 5/9/73 and Order 73-4, § 296-24-20507, filed 5/7/73.]

WAC 296-24-20509 Pulleys. (1) Guarding. Pulleys, any parts of which are seven (7) feet or less from the floor or working platform, shall be guarded in accordance with the standards specified in WAC 296-24-20527 and WAC 296-24-20531. Pulleys serving as balance wheels (e.g., punch presses) on which the point of contact between belt and pulley is more than six feet six inches (6 ft. 6 in.) from the floor or platform may be guarded with a disk covering the spokes.

(2) Location of Pulleys. (a) Unless the distance to the nearest fixed pulley, clutch, or hanger exceeds the width of the belt used, a guide shall be provided to prevent the belt from leaving the pulley on the side where insufficient clearance exists.

(b) Where there are overhanging pulleys on line, jack, or countershafts with no bearing between the pulley and the outer end of the shaft, a guide to prevent the belt from running off the pulley should be provided.

(3) Broken Pulleys. Pulleys with cracks, or pieces broken out of rims, shall not be used.

(4) Pulley Speeds. Pulleys intended to operate at rim speed in excess of manufacturers normal recommendations shall be specially designed and carefully balanced for the speed at which they are to operate.

(5) Compositions and Wood Pulleys. Composition or laminated wood pulleys shall not be installed where they are subjected to influences detrimental to their structural composition. [Order 73-5, § 296-24-20509, filed 5/9/73 and Order 73-4, § 296-24-20509, filed 5/7/73.]

WAC 296-24-20511 Belt, rope, and chain drives.

(1) Horizontal Belts and Ropes. (a) Where both runs of horizontal belts are seven (7) feet or less from the floor level, the guard shall extend to at least fifteen (15) inches above the belt or to a standard height (see Table O-12), except that where both runs of a horizontal belt are 42 inches or less from the floor, the belt shall be fully enclosed in accordance with WAC 296-24-20527 and WAC 296-24-20531.

(b) In powerplants or powerdevelopment rooms, a guardrail may be used in lieu of the guard required by (1)(a) of this section.

(2) Overhead Horizontal Belts. (a) Overhead horizontal belts, with lower parts seven (7) feet or less from the floor or platform, shall be guarded on sides and bottom in accordance with WAC 296-24-20531(3).

(b) Horizontal overhead belts more than seven (7) feet above floor or platform shall be guarded for their entire length under the following conditions:

(i) If located over passageways or work places and traveling 1,800 feet or more per minute.

(ii) If center to center distance between pulleys is ten (10) feet or more.

(iii) If belt is eight (8) inches or more in width.

(c) Where the upper and lower runs of horizontal belts are so located that passage of persons between them would be possible, the passage shall be either:

(i) Completely barred by a guardrail or other barrier in accordance with WAC 296-24-20527 and WAC 296-24-20531; or

(ii) Where passage is regarded as necessary, there shall be a platform over the lower run guarded on either side by a railing completely filled in with wire mesh or other filler, or by a solid barrier. The upper run shall be so guarded as to prevent contact therewith either by the worker or by objects carried by him. In powerplants only the lower run of the belt need be guarded.

(d) Overhead chain and link belt drives are governed by the same rules as overhead horizontal belts and shall be guarded in the same manner as belts.

(e) American or Continuous System rope drives so located that the condition of the rope (particularly the splice) cannot be constantly and conveniently observed, shall be equipped with a telltale device (preferably electric-bell type) that will give warning when rope begins to fray.

(3) Vertical and Inclined Belts. (a) Vertical and inclined belts shall be enclosed by a guard conforming to standards in WAC 296-24-20527 and WAC 296-24-20531.

(b) All guards for inclined belts shall be arranged in such a manner that a minimum clearance of seven (7) feet is maintained between belt and floor at any point outside of guard.

(4) Vertical Belts. Vertical belts running over a lower pulley more than seven (7) feet above floor or platform shall be guarded at the bottom in the same manner as horizontal overhead belts, if conditions are as stated in (2)(b)(i) and (iii) of this section.

(5) Cone-pulley Belts. (a) The cone belt and pulley shall be equipped with a belt shifter so constructed as to adequately guard the nip point of the belt and pulley. If the frame of the belt shifter does not adequately guard the nip point of the belt and pulley, the nip point shall be further protected by means of a vertical guard placed in front of the pulley and extending at least to the top of the largest step of the cone.

(b) If the belt is of the endless type or laced with rawhide laces, and a belt shifter is not desired, the belt will be considered guarded if the nip point of the belt and pulley is protected by a nip point guard located in front of the cone extending at least to the top of the largest step of the cone, and formed to show the contour of the cone in order to give the nip point of the belt and pulley the maximum protection.

(c) If the cone is located less than 3 feet from the floor or working platform, the cone pulley and belt shall be guarded to a height of 3 feet regardless of whether the belt is endless or laced with rawhide.

(6) Belt Tighteners. (a) Suspended counterbalanced tighteners and all parts thereof shall be of substantial construction and securely fastened; the bearings shall be securely capped. Means must be provided to prevent tightener from falling, in case the belt breaks.

(b) Where suspended counterweights are used and not guarded by location, they shall be so encased as to prevent accident.

(c) Belt tighteners, used for starting and stopping machinery, other than those which are securely held in "off" or "out of service" position by gravity, shall be provided with means or mechanism that will securely

hold the belt tightener away from the belt when the machine or part thereof driven by the belt is not in use. Such means or mechanism shall be automatic in its action in gripping, latching or otherwise fastening itself to and holding the belt tightener in "off" or "out of service" position until manually released. (Released by hand.)

(d) Counterbalanced belt tighteners and all parts thereof shall be of substantial construction, and securely fastened. The bearings shall be securely capped. If exposed to contact, means shall be installed to catch the belt tightener, to prevent tightener from falling on any person below, should the belt break or throw the tightener. [Order 73-5, § 296-24-20511, filed 5/9/73 and Order 73-4, § 296-24-20511, filed 5/7/73.]

WAC 296-24-20513 Gears, sprockets, and chains.

(1) Gears. Gears shall be guarded in accordance with one of the following methods:

(a) By a complete enclosure; or

(b) By a standard guard as described in WAC 296-24-20531, at least seven (7) feet high extending six (6) inches above the mesh point of the gears; or

(c) By a band guard covering the face of gear and having flanges extended inward beyond the root of the teeth on the exposed side or sides. Where any portion of the train of gears guarded by a band guard is less than six (6) feet from the floor a disk guard or a complete enclosure to the height of six (6) feet shall be required.

(2) Hand-operated Gears. (1) of this section does not apply to hand-operated gears used only to adjust machine parts and which do not continue to move after hand power is removed. However, the guarding of these gears is highly recommended.

(3) Sprockets and Chains. All sprocket wheels and chains shall be enclosed unless they are more than seven (7) feet above the floor or platform. Where the drive extends over other machine or working areas, protection against falling shall be provided. This section does not apply to manually operated sprockets.

(4) Openings for Oiling. When frequent oiling must be done, openings with hinged or sliding self-closing covers shall be provided. All points not readily accessible shall have oil feed tubes if lubricant is to be added while machinery is in motion. [Order 73-5, § 296-24-20513, filed 5/9/73 and Order 73-4, § 296-24-20513, filed 5/7/73.]

WAC 296-24-20515 Guarding friction drives. The driving point of all friction drives when exposed to contact shall be guarded, all arm or spoke friction drives and all web friction drives with holes in the web shall be entirely enclosed, and all projecting belts on friction drives where exposed to contact shall be guarded. [Order 73-5, § 296-24-20515, filed 5/9/73 and Order 73-4, § 296-24-20515, filed 5/7/73.]

WAC 296-24-20517 Keys, setscrews, and other projections. (1) All projecting keys, setscrews, and other projections in revolving parts shall be removed or made flush or guarded by metal covers. This section does not

apply to keys or setscrews within gear or sprocket casings or other enclosures, nor to keys, setscrews, or oilcups in hubs of pulleys less than twenty (20) inches in diameter where they are within the plane of the rim of the pulley.

NOTE: It is recommended, however, that no projecting setscrews or oilcups be used in any revolving pulley or part of machinery.

[Order 73-5, § 296-24-20517, filed 5/9/73 and Order 73-4, § 296-24-20517, filed 5/7/73.]

WAC 296-24-20519 Collars and couplings. (1) Collars. All revolving collars, including split collars, shall be cylindrical, and screws or bolts used in collars shall not project beyond the largest periphery of the collar.

(2) Couplings. Shaft couplings shall be so constructed as to present no hazard from bolts, nuts, setscrews, or revolving surfaces. Bolts, nuts, and setscrews will, however, be permitted where they are covered with safety sleeves or where they are used parallel with the shafting and are countersunk or else do not extend beyond the flange of the coupling. [Order 73-5, § 296-24-20519, filed 5/9/73 and Order 73-4, § 296-24-20519, filed 5/7/73.]

WAC 296-24-20521 Bearings and facilities for oiling. Self lubricating bearings are recommended and all drip cups and pans shall be securely fastened. [Order 73-5, § 296-24-20521, filed 5/9/73 and Order 73-4, § 296-24-20521, filed 5/7/73.]

WAC 296-24-20523 Guarding of clutches, cutoff couplings, and clutch pulleys. (1) Guards. Clutches, cutoff couplings, or clutch pulleys having projecting parts, where such clutches are located seven (7) feet or less above the floor or working platform, shall be enclosed by a stationary guard constructed in accordance with WAC 296-24-20527. A "U" type guard is permissible.

(2) Engineerrooms. In engineerrooms a guardrail, preferably with toeboard, may be used instead of the guard required by (1) of this section, provided such a room is occupied only by engineerroom attendants.

(3) Bearings. A bearing support immediately adjacent to a friction clutch or cutoff coupling shall have self-lubricating bearings requiring attention at infrequent intervals. [Order 73-5, § 296-24-20523, filed 5/9/73 and Order 73-4, § 296-24-20523, filed 5/7/73.]

WAC 296-24-20525 Belt shifters, clutches, shippers, poles, perches, and fasteners. (1) Belt Shifters. (a) Tight and loose pulleys on all installations made on or after August 27, 1971, shall be equipped with a permanent belt shifter provided with mechanical means to prevent belt from creeping from loose to tight pulley. It is recommended that old installations be changed to conform to this rule.

(b) Belt shifter and clutch handles shall be rounded and be located as far as possible from danger of accidental contact, but within easy reach of the operator.

Where belt shifters are not directly located over a machine or bench, the handles shall be cut off six feet six inches (6 ft. 6 in.) above floor level.

(c) All belt and clutch shifters of the same type in each shop should move in the same direction to stop machines, i.e., either all right or all left. This does not apply to friction clutch on countershaft carrying two clutch pulleys with open and crossed belts, respectively. In this case the shifter handle has three positions and the machine is at a standstill when clutch handle is in the neutral or center position.

(2) Belt Shippers and Shipper Poles. The use of belt poles as substitutes for mechanical shifters is not recommended. Where necessity compels their use, they shall be of sufficient size to enable workmen to grasp them securely. (A two-inch (2 in.) diameter or 1 1/2 by 2 inches cross-section is suggested.) Poles shall be smooth and preferably of straight grain hardwood, such as ash or hickory. The edges of rectangular poles should be rounded. Poles should extend from the top of the pulley to within about forty (40) inches of floor or working platform.

(3) Belt Perches. Where loose pulleys or idlers are not practicable, belt perches in form of brackets, rollers, etc., shall be used to keep idle belts away from the shafts. Perches should be substantial and designed for the safe shifting of belts.

(4) Belt Fasteners. Belts which of necessity must be shifted by hand and belts within seven (7) feet of the floor or working platform which are not guarded in accordance with WAC 296-24-20527 shall not be fastened with metal in any case, nor with any other fastening which by construction or wear will constitute an accident hazard. [Order 76-6, § 296-24-20525, filed 3/1/76; Order 73-5, § 296-24-20525, filed 5/9/73 and Order 73-4, § 296-24-20525, filed 5/7/73.]

WAC 296-24-20527 Standard guards—General requirements. (1) Materials. (a) Standard conditions shall be secured by the use of the following materials. Expanded metal, perforated or solid sheet metal, wire mesh on a frame of angle iron, or iron pipe securely fastened to floor or to frame of machine.

(b) All metal should be free from burrs and sharp edges.

(c) Wire mesh should be of the type in which the wires are securely fastened at every cross point either by welding, soldering, or galvanizing, except in case of diamond or square wire mesh made of No. 14 gage wire, 3/4-inch mesh or heavier.

(2) Methods of Manufacture. (a) Expanded metal, sheet or perforated metal, and wire mesh shall be securely fastened to frame by one of the following methods:

(i) With rivets or bolts spaced not more than five (5) inches center to center. In case of expanded metal or wire mesh, metal strips or clips shall be used to form a washer for rivets or bolts.

(ii) By welding to frame every four (4) inches.

(iii) By weaving through channel or angle frame, or if No. 14 gage 3/4-inch mesh or heavier is used by bending entirely around rod frames.

(iv) Where openings in pipe railing are to be filled in with expanded metal, wire mesh or sheet metal, the filler material shall be made into panels with rolled edges or bound with "V" or "U" edging of No. 24 gage or heavier sheet metal fastened to the panels with bolts or rivets spaced not more than five (5) inches center to center. The bound panels shall be fastened to the railing by sheet-metal clips spaced not more than five (5) inches center to center.

(v) Diamond or square mesh made of crimped wire fastened into channels, angle or round-iron frames, may also be used as a filler in guards. Size of mesh shall correspond to Table O-12.

(b) Where the design of guards requires filler material of greater area than 12 square feet, additional frame members shall be provided to maintain panel area within this limit.

(c) All joints of framework shall be made equivalent in strength to the material of the frame. [Order 73-5, § 296-24-20527, filed 5/9/73 and Order 73-4, § 296-24-20527, filed 5/7/73.]

WAC 296-24-20529 Disk, shield, and "U" guards.

(1) Disk Guards. A disk guard shall consist of a sheet-metal disk not less than No. 22 gage fastened by "U" bolts or rivets to spokes of pulleys, flywheels, or gears. Where possibility of contact with sharp edges of the disk exists, the edge shall be rolled or wired. In all cases the nuts shall be provided with locknuts which shall be placed on the unexposed side of the wheel.

(2) Shield Guards. (a) A shield guard shall consist of a frame filled in with wire mesh, expanded, perforated, or solid sheet metal.

(b) If area of shield does not exceed six (6) square feet the wire mesh or expanded metal may be fastened in a framework of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle iron or metal construction of equivalent strength. Metal shields may have edges entirely rolled around a 3/8-inch solid iron rod.

(3) "U" Guards. A "U" guard consisting of a flat surface with edge members shall be designed to cover the under surface and lower edge of a belt, multiple chain, or rope drive. It shall be constructed of materials specified in Table O-12, and shall conform to the requirements of WAC 296-24-20531(3) and (4). Edges shall be smooth and if size of guard requires, the edges shall be reinforced by rolling, wiring, or by binding with angle or flat iron. [Order 73-5, § 296-24-20529, filed 5/9/73 and Order 73-4, § 296-24-20529, filed 5/7/73.]

WAC 296-24-20531 Approved materials. (1) Minimum Requirements. The materials and dimensions specified in this section shall apply to all guards, except horizontal overhead belts, rope, cable, or chain guards more than seven (7) feet above floor, or platform. (For the latter, see Table O-13.)

(a) Minimum dimensions of materials for the framework of all guards, except as noted in (1)(a)(iii) of this section shall be angle iron 1 inch by 1 inch by 1/8 inch, metal pipe of 3/4-inch inside diameter or metal construction of equivalent strength.

(i) All guards shall be rigidly braced every three (3) feet or fractional part of their height to some fixed part of machinery or building structure. Where guard is exposed to contact with moving equipment additional strength may be necessary.

(ii) The framework for all guards fastened to floor or working platform and without other support or bracing shall consist of 1 1/2-inch by 1 1/2-inch by 1/8-inch angle iron, metal pipe of 1 1/2-inch inside diameter, or metal construction of equivalent strength. All rectangular guards shall have at least four upright frame members each of which shall be carried to the floor and be securely fastened thereto. Cylindrical guards shall have at least three supporting members carried to floor.

(iii) Guards thirty (30) inches or less in height and with a total surface area not in excess of ten (10) square feet may have a frame work of 3/8-inch solid rod, 3/4-inch by 3/4-inch by 1/8-inch angle, or metal construction of equivalent strength. The filling material shall correspond to the requirements of Table O-12.

(b) The specifications given in Table O-12 and (1)(a) of this section are minimum requirements; where guards are exposed to unusual wear, deterioration or impact, heavier material and construction should be used to protect amply against the specific hazards involved.

(2) Wood Guards. (a) Wood guards may be used in the woodworking and chemical industries, in industries where the presence of fumes or where manufacturing conditions would cause the rapid deterioration of metal guards; also in construction work and in locations outdoors where extreme cold or extreme heat make metal guards and railings undesirable. In all other industries, wood guards shall not be used.

(i) Wood shall be sound, tough, and free from any loose knots.

(ii) Guards shall be made of planed lumber not less than one (1) inch rough board measure, and edges and corners rounded off.

(iii) Wood guards shall be securely fastened together with wood screws, hardwood dowel pins, bolts, or rivets.

(iv) While no definite dimensions are given under this heading for framework or filler materials, wood guards shall be equal in strength and rigidity to metal guards specified in (1)(a) and (b) of this section and Table O-12.

(v) For construction of standard wood railing, see (5) of this section.

(3) Guards for Horizontal Overhead Belts. (a) Guards for horizontal overhead belts shall run the entire length of the belt and follow the line of the pulley to the ceiling or be carried to the nearest wall, thus enclosing the belt effectively. Where belts are so located as to make it impracticable to carry the guard to wall or ceiling, construction of guard shall be such as to enclose completely the top and bottom runs of belt and the face of pulleys.

(b) The guard and all its supporting members shall be securely fastened to wall or ceiling by gimlet-point lag screws or through bolts. In case of masonry construction, expansion bolts shall be used. The use of bolts placed horizontally through floor beams or ceiling rafters is recommended.

(c) Suitable reinforcement shall be provided for the ceiling rafters or overhead floor beams, where such is necessary, to sustain safely the weight and stress likely to be imposed by the guard. The interior surface of all guards, by which is meant the surface of the guard with which a belt will come in contact, shall be smooth and free from all projections of any character, except where construction demands it; protruding shallow roundhead rivets may be used. Overhead belt guards shall be at least one-quarter wider than belt which they protect, except that this clearance need not in any case exceed six (6) inches on each side. Overhead rope drive and block and roller-chain-drive guards shall be not less than six (6) inches wider than the drive on each side. In overhead silent chain-drive guards where the chain is held from lateral displacement on the sprockets, the side clearances required on drives of twenty (20) inch centers or under shall be not less than one-fourth inch from the nearest moving chain part, and on drives of over twenty (20) inch centers a minimum of one-half inch from the nearest moving chain part.

(d) Table O-13 gives the sizes of materials to be used and the general construction specifications of guards for belts ten (10) inches or more in width. No material for overhead belt guards should be smaller than that specified in Table O-13 for belts ten (10) to fourteen (14) inches wide, even if the overhead belt is less than ten (10) inches in width. However, No. 20 gage sheet metal may be used as a filler on guards for belts less than ten (10) inches wide. Expanded metal, because of the sharp edges, should not be used as a filler in horizontal belt guards.

(e) For clearance between guards and belts, ropes or chains of various center to center dimensions between the shafts, see bottom of Table O-13.

(4) Guards for Horizontal Overhead-rope and Chain-drives. Overhead-rope and chain-drive guard construction shall conform to the rules for overhead-belt guard construction of similar width, except that the filler material shall be of the solid type as shown in Table O-13, unless the fire hazard demands the use of open construction. A side guard member of the same solid filling material should be carried up in a vertical position two (2) inches above the level of the lower run of the rope or chain drive and two (2) inches within the periphery of the pulleys which the guard encloses thus forming a trough. These side filler members should be reinforced on the edges with 1 1/2-inch by 1/4-inch flat steel, riveted to the filling material at not greater than eight (8) inch centers; the reinforcing strip should be fastened or bolted to all guard supporting members with at least one 3/8-inch rivet or bolt at each intersection, and the ends should be secured to the ceiling with lag screws or bolts. The filling material shall be fastened to the framework of the guard and the filler supports by 3/16-inch rivets spaced on 4-inch centers. The width of the multiple drive shall be determined by measuring the distance from the outside of the first to the outside of the last rope or chain in the group accommodated by the pulley.

(5) Guardrails and Toeboards. (a) Guardrail shall be forty-two (42) inches in height, with midrail between top rail and floor.

(b) Posts shall be not more than eight (8) feet apart; they are to be permanent and substantial, smooth, and free from protruding nails, bolts, and splinters. If made of pipe, the post shall be one and one-fourth (1 1/4) inches inside diameter, or larger. If made of metal shapes or bars, their section shall be equal in strength to that of one and one-half (1 1/2) by one and one-half (1 1/2) by three-sixteenths (3/16) inch angle iron. If made of wood, the posts shall be two by four (2 x 4) inches or larger. The upper rail shall be two by four (2 x 4) inches, or two one by four (1 x 4) strips, one at the top and one at the side of posts. The midrail may be one by four (1 x 4) inches or more. The rails (metal shapes, metal bars, or wood), should be on that side of the posts which gives the best protection and support. Where panels are fitted with expanded metal or wire mesh as noted in Table O-12 the middle rails may be omitted. Where guard is exposed to contact with moving equipment, additional strength may be necessary.

(c) Toeboards shall be four (4) inches or more in height, of wood, metal, or of metal grill not exceeding one (1) inch mesh. Toeboards at flywheel pits should preferably be placed as close to edge of the pit as possible.

TABLE O-12

TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points	Largest mesh or opening allowable	Minimum gauge (U.S. Standard) or thickness	Minimum height of guard
				from floor or platform level
	Inches	Inches	Inches	Feet
Woven wire	Under 2	3/8	No. 16	7
	2-4	1/2	No. 16	7
	Under 4	1/2	No. 16	7
	4-15	2	No. 12	7
Expanded metal	Under 4	1/2	No. 18	7
	4-15	2	No. 13	7
Perforated metal	Under 4	1/2	No. 20	7
	4-15	2	No. 14	7
Sheet metal	Under 4		No. 22	7
	4-15		No. 22	7
Wood or metal strip crossed	Under 4	3/8	Wood 3/4 Metal No. 16	7
	4-15	2	Wood 3/4 Metal No. 16	7
	Under 4	1/2 width	Wood 3/4 Metal No. 16	7
Wood or metal strip not crossed	Under 4	1 width	Wood 3/4 Metal No. 16	7
	4-15	1 width	Wood 3/4 Metal No. 16	7
Standard rail	Min. 15			
	Max. 20			

[Order 76-6, § 296-24-20531, filed 3/1/76; Order 73-5, § 296-24-20531, filed 5/9/73 and Order 73-4, § 296-24-20531, filed 5/7/73.]

[Title 296 WAC—p 340]

WAC 296-24-20533 Care of equipment. (1) General. All power-transmission equipment shall be inspected at intervals not exceeding 60 days and be kept in good working condition at all times.

(2) Shafting. (a) Shafting shall be kept in alignment, free from rust and excess oil or grease.

(b) Where explosives, explosive dusts, flammable vapors or flammable liquids exist, the hazard of static sparks from shafting shall be carefully considered.

(3) Bearings. Bearings shall be kept in alignment and properly adjusted.

(4) Hangers. Hangers shall be inspected to make certain that all supporting bolts and screws are tight and that supports of hanger boxes are adjusted properly.

(5) Pulleys. (a) Pulleys shall be kept in proper alignment to prevent belts from running off.

(b) One or both pulleys carrying a nonshifting belt should have crowned faces.

(c) Cast-iron pulleys should be tested frequently with a hammer to disclose cracks in rim or spokes. It should be borne in mind that the sound is usually much different if the belt is or is not on the pulley.

(d) Split pulleys should be inspected to ascertain if all bolts holding together the sections of the pulley are tight.

(6) Care of Belts. (a) Quarter-twist belts when installed without an idler can be used on drives running in one direction only. They will run off a pulley when direction of motion is reversed.

(b) Inspection shall be made of belts, lacings, and fasteners and such equipment kept in good repair.

(c) Where possible, dressing should not be applied when belt or rope is in motion; but, if this is necessary, it should be applied where belts or rope leave pulley, not where they approach. The same precautions apply to lubricating chains. In the case of V-belts, belt dressing is neither necessary nor advisable.

(7) Lubrication. The regular oilers shall wear tightfitting clothing and should use cans with long spouts to keep their hands out of danger. Machinery shall be oiled when not in motion, wherever possible.

TABLE O-12

TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points	Largest mesh or opening allowable	Minimum gauge (U.S. Standard) or thickness	Minimum height of guard
				from floor or platform level
	Inches	Inches	Inches	Feet
Woven wire	Under 2	3/8	No. 16	7
	2-4	1/2	No. 16	7
	Under 4	1/2	No. 16	7
	4-15	2	No. 12	7
Expanded metal	Under 4	1/2	No. 18	7
	4-15	2	No. 13	7
Perforated metal	Under 4	1/2	No. 20	7
	4-15	2	No. 14	7

TABLE O-12

TABLE OF STANDARD MATERIALS AND DIMENSIONS

Material	Clearance from moving part at all points	Largest mesh or opening allowable	Minimum gauge (U.S. Standard) or thickness	Minimum height of guard from floor or platform level	Width	
					Inches	Feet
Sheet metal	Under 4	————	No. 22	————	7	
	4-15	————	No. 22	————	7	
Wood or metal strip crossed	Under 4	3/8	Wood 3/4	Metal No. 16	7	
	4-15	2	Wood 3/4	Metal No. 16	7	
Wood or metal strip not crossed	Under 4	1/2 width	Wood 3/4	Metal No. 16	7	
	4-15	1 width	Wood 3/4	Metal No. 16	7	
Standard rail	Min. 15	————	————	————	————	————
	Max. 20	————	————	————	————	————

TABLE O-13

HORIZONTAL OVERHEAD BELTS, ROPES, AND CHAINS 7 FEET OR MORE ABOVE FLOOR OR PLATFORM

[TABLE O-13: Part 1—0" to 14"]

	Width	
	From 0" to 14" inclusive	Material
MEMBERS		
Framework	1 1/2"x1 1/2"x1/4"	Angle iron.
Filler (belt guards)	1 1/2"x3/16"	Flat iron.
Filler and vertical side member.	No. 20 A.W.G.	Solid sheet metal.
Filler supports	2"x5/16" flat iron	Flat and angle.
Guard supports	2"x5/16"	Flat iron.
FASTENINGS		
Filler supports to framework	(2) 3/16"	Rivets.
Filler flats to supports (belt guards).	(1) 5/16"	Flush rivets.
Filler to frame and supports (chain guards).	3/16" rivets spaced	
Guard supports to frame work.	(2) 3/6"	Rivets or bolts.
Guard and supports to overhead ceiling.	1/4"x3 1/2" lag screws or 1/2" bolts.	Lag screws or bolts.
DETAILS—SPACING, ETC.		
Width of guards	One-quarter wider than belt, rope, or chain drive.	
Spacing between filler supports.	20" C. to C	
Spacing between filler flats (belt guards).	2" apart	
Spacing between guard supports.	36" C. to C	

[TABLE O-13: Part 1—0" to 14"]

	Width	
	From 0" to 14" inclusive	Material
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards.	No. 20 A.W.G.	Solid or perforated.
Woven wire, 2" mesh	No. 12 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts.	Up to 15' inclusive	Over 40'.
Clearance from belt, or chain to guard.	6"	20".

[TABLE O-13: Part 2—Over 14" to 24"]

	Width	
	Over 14" to 24" inclusive	Material
MEMBERS		
Framework	2"x2"x5/16"	Angle iron.
Filler (belt guards)	2"x3/16"	Flat iron.
Filler and vertical side member.	No. 18 A.W.G.	Solid sheet metal.
Filler supports	2"x3/8" flat iron	Flat and angle.
Guard supports	2"x3/8"	Flat iron.
FASTENINGS		
Filler supports to framework	(2) 3/6"	Rivets.
Filler flats to supports (belt guards).	(1) 5/16"	Flush rivets.
Filler to frame and supports (chain guards).	8" centers on sides and 4" centers on bottom.	
Guard supports to frame work.	(2) 7/16"	Rivets or bolts.
Guard and supports to overhead ceiling.	5/8"x4" lag screws or 5/8" bolts.	Lag screws or bolts.
DETAILS—SPACING, ETC.		
Width of guards	————	
Spacing between filler supports.	16" C. to C	
Spacing between filler flats (belt guards).	2 1/2" apart	
Spacing between guard supports.	36" C. to C	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards.	No. 18 A.W.G.	Solid or perforated.
Woven wire, 2" mesh	No. 10 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts.	Over 15' to 25' inclusive.	Over 40'.
Clearance from belt, or chain to guard.	10"	20".

[TABLE O-13: Part 3—Over 24"]

	Width	
	Over 24"	Material
MEMBERS		
Framework	3"x3"x3/8"	Angle iron.
Filler (belt guards)	2"x5/16"	Flat iron.
Filler and vertical side member.	No. A.W.G.	Solid sheet metal.
Filler supports	2 1/2"x2 1/2"x1/4" angle	Flat and angle.
Guard supports	2 1/2"x3/8"	Flat iron.
FASTENINGS		
Filler supports to framework	(3) 1/2"	Rivets.
Filler flats to supports (belt guards).	(2) 3/8"	Flush rivets.
Filler to frame and supports (chain guards).		
Guard supports to frame work.	(2) 5/8"	Rivets or bolts.
Guard and supports to overhead ceiling.	3/4"x6" lag screws or 3/4" bolts.	Lag screws or bolts.
DETAILS—SPACING, ETC.		
Width of guards		
Spacing between filler supports.	16" C. to C.	
Spacing between filler flats (belt guards).	4" apart	
Spacing between guard supports.	36" C. to C.	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards.	No. 18 A.W.G.	Solid or perforated.
Woven wire, 2" mesh	No. 8 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts.	Over 25' to 40' inclusive.	Over 40'.
Clearance from belt, or chain to guard.	15"	20".

[Order 73-5, § 296-24-20533, filed 5/9/73 and Order 73-4, § 296-24-20533, filed 5/7/73.]

Part D
MATERIALS HANDLING AND STORAGE,
INCLUDING CRANES, DERRICKS, ETC., AND
RIGGING

WAC

296-24-215	Materials handling and storage—Handling materials—General.
296-24-21501	Use of mechanical equipment.
296-24-21503	Secure storage.
296-24-21505	Housekeeping.
296-24-21507	Drainage.
296-24-21509	Clearance limits.
296-24-21511	Rolling railroad cars.
296-24-21513	Guarding.
296-24-21515	Conveyors.
296-24-230	Powered industrial trucks.
296-24-23001	Definition.
296-24-23003	General requirements.
296-24-23005	Designations.

296-24-23007	Designated locations.
296-24-23009	Converted industrial trucks.
296-24-23011	Safety guards.
296-24-23013	Fuel handling and storage.
296-24-23015	Changing and charging storage batteries.
296-24-23017	Lighting for operating areas.
296-24-23019	Control of noxious gases and fumes.
296-24-23021	Dockboards (bridge plates).
296-24-23023	Trucks and railroad cars.
296-24-23025	Operator training.
296-24-23027	Truck operations.
296-24-23029	Traveling.
296-24-23031	Loading.
296-24-23033	Operation of the truck.
296-24-23035	Maintenance of industrial trucks.
296-24-233	Motor vehicle trucks and trailers.
296-24-235	Overhead and gantry cranes.
296-24-23501	Definitions.
296-24-23503	General requirements.
296-24-23505	Cabs.
296-24-23507	Footwalks and ladders.
296-24-23509	Stops, bumpers, rail sweeps, and guards.
296-24-23511	Brakes.
296-24-23513	Electric equipment.
296-24-23515	Hoisting equipment.
296-24-23517	Warning device.
296-24-23519	Inspection.
296-24-23521	Testing.
296-24-23523	Maintenance.
296-24-23525	Rope inspection.
296-24-23527	Handling the load.
296-24-23529	Operators.
296-24-23531	Other requirements—General.
296-24-237	Construction, operation and maintenance—Chain and electric hoists.
296-24-238	Air hoists.
296-24-240	Crawler locomotive and truck cranes.
296-24-24001	Definitions.
296-24-24003	General requirements.
296-24-24005	Load ratings.
296-24-24007	Inspection classification.
296-24-24009	Testing.
296-24-24011	Maintenance procedure.
296-24-24013	Rope inspection.
296-24-24015	Handling the load.
296-24-24017	Other requirements.
296-24-24019	Operating near electric power lines.
296-24-245	Derricks.
296-24-24501	Definitions.
296-24-24503	General requirements.
296-24-24505	Load ratings.
296-24-24507	Inspection.
296-24-24509	Testing.
296-24-24511	Maintenance.
296-24-24513	Rope inspection.
296-24-24515	Operations of derricks.
296-24-24517	Handling the load.
296-24-24519	Other requirements.
296-24-260	Helicopters.
296-24-293	"A" frames.
296-24-294	Rigging.
296-24-29401	Wire rope.
296-24-29403	Hemp rope.
296-24-29405	Hemp and wire rope slings.
296-24-29407	Guys.
296-24-29409	Thimbles.
296-24-29411	Blocks and falls.
296-24-29413	Chains and cables.
296-24-29415	Slings.
296-24-29417	Definitions.
296-24-29419	Safe operating practices.
296-24-29421	Inspections.
296-24-29423	Alloy steel chain slings.
296-24-29425	Wire rope slings.
296-24-29427	Metal mesh slings.
296-24-29429	Natural and synthetic fiber rope slings.
296-24-29431	Synthetic web slings.

[TABLE O-13: Part 3—Over 24"]

	Width	
	Over 24"	Material
MEMBERS		
Framework	3"x3"x3/8"	Angle iron.
Filler (belt guards)	2"x5/16"	Flat iron.
Filler and vertical side member.	No. A.W.G.	Solid sheet metal.
Filler supports	2 1/2"x2 1/2"x1/4" angle	Flat and angle.
Guard supports	2 1/2"x3/8"	Flat iron.
FASTENINGS		
Filler supports to framework	(3) 1/2"	Rivets.
Filler flats to supports (belt guards).	(2) 3/8"	Flush rivets.
Filler to frame and supports (chain guards).		
Guard supports to frame work.	(2) 5/8"	Rivets or bolts.
Guard and supports to overhead ceiling.	3/4"x6" lag screws or 3/4" bolts.	Lag screws or bolts.
DETAILS—SPACING, ETC.		
Width of guards		
Spacing between filler supports.	16" C. to C.	
Spacing between filler flats (belt guards).	4" apart	
Spacing between guard supports.	36" C. to C.	
OTHER BELT GUARD FILLING PERMITTED		
Sheet metal fastened as in chain guards.	No. 18 A.W.G.	Solid or perforated.
Woven wire, 2" mesh	No. 8 A.W.G.	
CLEARANCE FROM OUTSIDE OF BELT, ROPE, OR CHAIN DRIVE TO GUARD		
Distance center to center of shafts.	Over 25' to 40' inclusive.	Over 40'.
Clearance from belt, or chain to guard.	15"	20".

[Order 73-5, § 296-24-20533, filed 5/9/73 and Order 73-4, § 296-24-20533, filed 5/7/73.]

Part D
MATERIALS HANDLING AND STORAGE,
INCLUDING CRANES, DERRICKS, ETC., AND
RIGGING

WAC

296-24-215	Materials handling and storage—Handling materials—General.
296-24-21501	Use of mechanical equipment.
296-24-21503	Secure storage.
296-24-21505	Housekeeping.
296-24-21507	Drainage.
296-24-21509	Clearance limits.
296-24-21511	Rolling railroad cars.
296-24-21513	Guarding.
296-24-21515	Conveyors.
296-24-230	Powered industrial trucks.
296-24-23001	Definition.
296-24-23003	General requirements.
296-24-23005	Designations.

296-24-23007	Designated locations.
296-24-23009	Converted industrial trucks.
296-24-23011	Safety guards.
296-24-23013	Fuel handling and storage.
296-24-23015	Changing and charging storage batteries.
296-24-23017	Lighting for operating areas.
296-24-23019	Control of noxious gases and fumes.
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296-24-23031	Loading.
296-24-23033	Operation of the truck.
296-24-23035	Maintenance of industrial trucks.
296-24-233	Motor vehicle trucks and trailers.
296-24-235	Overhead and gantry cranes.
296-24-23501	Definitions.
296-24-23503	General requirements.
296-24-23505	Cabs.
296-24-23507	Footwalks and ladders.
296-24-23509	Stops, bumpers, rail sweeps, and guards.
296-24-23511	Brakes.
296-24-23513	Electric equipment.
296-24-23515	Hoisting equipment.
296-24-23517	Warning device.
296-24-23519	Inspection.
296-24-23521	Testing.
296-24-23523	Maintenance.
296-24-23525	Rope inspection.
296-24-23527	Handling the load.
296-24-23529	Operators.
296-24-23531	Other requirements—General.
296-24-237	Construction, operation and maintenance—Chain and electric hoists.
296-24-238	Air hoists.
296-24-240	Crawler locomotive and truck cranes.
296-24-24001	Definitions.
296-24-24003	General requirements.
296-24-24005	Load ratings.
296-24-24007	Inspection classification.
296-24-24009	Testing.
296-24-24011	Maintenance procedure.
296-24-24013	Rope inspection.
296-24-24015	Handling the load.
296-24-24017	Other requirements.
296-24-24019	Operating near electric power lines.
296-24-245	Derricks.
296-24-24501	Definitions.
296-24-24503	General requirements.
296-24-24505	Load ratings.
296-24-24507	Inspection.
296-24-24509	Testing.
296-24-24511	Maintenance.
296-24-24513	Rope inspection.
296-24-24515	Operations of derricks.
296-24-24517	Handling the load.
296-24-24519	Other requirements.
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296-24-29405	Hemp and wire rope slings.
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296-24-29409	Thimbles.
296-24-29411	Blocks and falls.
296-24-29413	Chains and cables.
296-24-29415	Slings.
296-24-29417	Definitions.
296-24-29419	Safe operating practices.
296-24-29421	Inspections.
296-24-29423	Alloy steel chain slings.
296-24-29425	Wire rope slings.
296-24-29427	Metal mesh slings.
296-24-29429	Natural and synthetic fiber rope slings.
296-24-29431	Synthetic web slings.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS SUBCHAPTER

- 296-24-220 Indoor general storage. [Order 73-5, § 296-24-220, filed 5/9/73 and Order 73-4, § 296-24-220, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22001 Definitions. [Order 73-5, § 296-24-22001, filed 5/9/73 and Order 73-4, § 296-24-22001, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22003 General requirements. [Order 73-5, § 296-24-22003, filed 5/9/73 and Order 73-4, § 296-24-22003, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22005 Piling procedures and precautions. [Order 73-5, § 296-24-22005, filed 5/9/73 and Order 73-4, § 296-24-22005, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22007 Fire protection requirements. [Order 73-5, § 296-24-22007, filed 5/9/73 and Order 73-4, § 296-24-22007, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22009 Mechanical handling equipment. [Order 73-5, § 296-24-22009, filed 5/9/73 and Order 73-4, § 296-24-22009, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.
- 296-24-22011 Building service equipment. [Order 73-5, § 296-24-22011, filed 5/9/73 and Order 73-4, § 296-24-22011, filed 5/7/73.] Repealed by Order 74-27, filed 5/7/74.

WAC 296-24-215 Materials handling and storage—Handling materials—General. [Order 73-5, § 296-24-215, filed 5/9/73 and Order 73-4, § 296-24-215, filed 5/7/73.]

WAC 296-24-21501 Use of mechanical equipment. Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repair, with no obstruction across or in aisles that could create a hazard. Permanent aisles and passageways shall be appropriately marked. [Order 73-5, § 296-24-21501, filed 5/9/73 and Order 73-4, § 296-24-21501, filed 5/7/73.]

WAC 296-24-21503 Secure storage. Storage of material shall not create a hazard. Bags, containers, bundles, etc., stored in tiers shall be stacked, blocked, interlocked and limited in height so that they are stable and secure against sliding or collapse. [Order 73-5, § 296-24-21503, filed 5/9/73 and Order 73-4, § 296-24-21503, filed 5/7/73.]

WAC 296-24-21505 Housekeeping. Storage areas shall be kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage. Vegetation control will be exercised when necessary. [Order 73-5, § 296-24-21505, filed 5/9/73 and Order 73-4, § 296-24-21505, filed 5/7/73.]

WAC 296-24-21507 Drainage. Proper drainage shall be provided. [Order 73-5, § 296-24-21507, filed 5/9/73 and Order 73-4, § 296-24-21507, filed 5/7/73.]

WAC 296-24-21509 Clearance limits. Clearance signs to warn of clearance limits shall be provided. [Order 73-5, § 296-24-21509, filed 5/9/73 and Order 73-4, § 296-24-21509, filed 5/7/73.]

WAC 296-24-21511 Rolling railroad cars. Deraill and/or bumper blocks shall be provided on spur railroad tracks where a rolling car could contact other cars being worked, enter a building, work or traffic area.

(1) A clearly audible warning system shall be employed when cars are being moved by car pullers or locomotives, and when the person responsible for the moving does not have assurance that the area is clear, and it is safe to move the car or cars. [Order 74-27, § 296-24-21511, filed 5/7/74; Order 73-5, § 296-24-21511, filed 5/9/73 and Order 73-4, § 296-24-21511, filed 5/7/73.]

WAC 296-24-21513 Guarding. Covers and/or guardrails shall be provided to protect personnel from the hazards of open pits, tanks, vats, ditches, etc. [Order 73-5, § 296-24-21513, filed 5/9/73 and Order 73-4, § 296-24-21513, filed 5/7/73.]

WAC 296-24-21515 Conveyors. Conveyors shall be constructed operated and maintained in accordance with the provisions of ANSI B 20.1-1957. The following additional provisions shall also apply where applicable. (1) When the return strand of a conveyor operates within seven feet (7') of the floor there shall be a trough provided of sufficient strength to carry the weight resulting from a broken chain.

(2) 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.

(3) When the working strand of a conveyor crosses within three feet (3') of the floor level in passageways, the trough in which it works shall be bridged the full width of the passageway.

(4) 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.

(5) Walking on Rolls Prohibited. Employees shall not be allowed to walk on the rolls of roller-type conveyors except for emergency.

(6) 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.

(7) 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.

(8) 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.

(9) 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.

(10) Replacement of Parts. Replacement parts shall be equal to or exceed the manufacturer's specifications. [Order 74-27, § 296-24-21515, filed 5/7/74; Order 73-5, § 296-24-21515, filed 5/9/73 and Order 73-4, § 296-24-21515, filed 5/7/73.]

WAC 296-24-230 Powered industrial trucks. [Order 73-5, § 296-24-230, filed 5/9/73 and Order 73-4, § 296-24-230, filed 5/7/73.]

WAC 296-24-23001 Definition. These definitions are applicable to all sections of this chapter containing WAC 296-24-230 in the section number. As used in those sections, the term, "approved truck" or "approved industrial truck" means a truck that is listed or approved for fire safety purposes for the intended use by a nationally recognized testing laboratory, e.g. Underwriters Laboratories, Inc.; Factory Mutual Engineering Corp., using nationally recognized testing standards. [Order 74-27, § 296-24-23001, filed 5/7/74; Order 73-5, § 296-24-23001, filed 5/9/73 and Order 73-4, § 296-24-23001, filed 5/7/73.]

WAC 296-24-23003 General requirements. These requirements are applicable to all sections of this chapter containing the WAC 296-24-230 in the section number. (1) This section contains safety requirements relating to fire protection design, maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks, powered by electric motors or internal combustion engines. This section does not apply to compressed gas-operated industrial trucks, nor to farm vehicles, to vehicles intended primarily for earth moving or over-the-road hauling.

(2) All new powered industrial trucks acquired and used by an employer after the effective date of these standards shall meet the design and construction requirements for powered industrial trucks established in the "American National Standard for Powered Industrial Trucks, Part II, ANSI B56.1-1969", except for vehicles intended primarily for earth moving or over-the-road hauling.

(3) Approved trucks shall bear a label or some other identifying mark indicating approval by the testing laboratory as meeting the specifications and requirements of ANSI B56.1-1969.

(4) Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly.

(5) If the truck is equipped with front-end attachments other than factory installed attachments, it shall be marked to identify the attachments and show the approximate weight of the truck and attachment combination at maximum elevation with load laterally centered.

(6) The user shall see that all nameplates and markings are in place and are maintained in a legible condition. [Order 76-6, § 296-24-23003, filed 3/1/76; Order 74-27, § 296-24-23003, filed 5/7/74; Order 73-5 § 296-24-23003, filed 5/9/73 and Order 73-4, § 296-24-23003, filed 5/7/73.]

WAC 296-24-23005 Designations. For the purpose of this standard there are eleven different designations of industrial trucks or tractors as follows: D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS.

(1) The D designated units are units similar to the G units except that they are diesel engine powered instead of gasoline engine powered.

(2) The DS designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a D unit may not be considered suitable.

(3) The DY designated units are diesel powered units that have all the safeguards of the DS units and in addition do not have any electrical equipment, including the ignition, and are equipped with temperature limitation features.

(4) The E designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(5) The ES designated units are electrically powered units that, in addition to all of the requirements for the E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures. They may be used in some locations where the use of an E unit may not be considered suitable.

(6) The EE designated units are electrically powered units that have, in addition to all of the requirements for the E and ES units, the electric motors and all other electrical equipment completely enclosed. In certain locations the EE unit may be used where the use of an E and ES unit may not be considered suitable.

(7) The EX designated units are electrically powered units that differ from E, ES, or EE units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(8) The G designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(9) The GS designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of a G unit may not be considered suitable.

(10) The LP designated unit is similar to the G unit except that liquefied petroleum gas is used for fuel instead of gasoline.

(11) The LPS designated units are liquefied petroleum gas powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of an LP unit may not be considered suitable.

(12) The atmosphere or location shall have been classified as to whether it is hazardous or nonhazardous prior to the consideration of industrial trucks being used therein and the type of industrial truck required shall be as provided in WAC 296-24-23009 for such location. [Order 73-5, § 296-24-23005, filed 5/9/73 and Order 73-4, § 296-24-23005, filed 5/7/73.]

WAC 296-24-23007 Designated locations. (1) The industrial trucks specified under (2) of this section are the minimum types required but industrial trucks having greater safeguards may be used if desired.

(2) For specific areas of use see Table N-1 following this section which tabulates the information contained in this section. References in parentheses are to the corresponding classification as used in the National Electrical Code NFPA No. 70-1971; ANSI Standard CI-1971 (Rev. of 1968) for the convenience of persons familiar with those classifications.

(a) Power-operated industrial trucks shall not be used in atmospheres containing hazardous concentration of acetylene, butadiene, ethylene oxide, hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas), propylene oxide, acetaldehyde, cyclopropane, diethyl ether, ethylene, isoprene, or unsymmetrical dimethyl hydrazine (UDMH).

(i) Power-operated industrial trucks shall not be used in atmospheres containing hazardous concentrations of metal dust, including aluminum, magnesium, and their commercial alloys, other metals of similarly hazardous characteristics, or in atmospheres containing carbon black, coal or coke dust except approved power-operated industrial trucks designated as EX may be used in such atmospheres.

(ii) In atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks shall have enclosures specifically approved for such locations.

(b) Only approved power-operated industrial trucks designated as EX may be used in atmospheres containing acetone, acrylonitrile, alcohol, ammonia, benzene, butane, ethylene dichloride, gasoline, hexane, lacquer solvent vapors, naphtha, natural gas, propane, propylene, styrene, vinyl acetate, vinyl chloride, or xylenes in quantities sufficient to produce explosive or ignitable mixtures and where such concentrations of these gases or vapors exist continuously, intermittently or periodically under normal operating conditions or may exist frequently because of repair, maintenance operations, leakage, breakdown or faulty operation of equipment.

(c) Power-operated industrial trucks designated as DY, EE, or EX may be used in locations where 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 the case of abnormal operation of equipment; also in locations in which hazardous concentrations of gases or vapors are normally prevented

by positive mechanical ventilation but which might become hazardous through failure or abnormal operation of the ventilating equipment; or in locations which are adjacent to Class I, Division 1 locations, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clear air, and effective safeguards against ventilation failure are provided.

(d) In locations used for the storage of hazardous liquids in sealed containers or liquefied or compressed gases in containers, approved power-operated industrial trucks designated as DS, ES, GS, or LPS may be used. This classification 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 operation condition. The quantity of hazardous 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 should receive consideration in determining whether or not the DS or DY, ES, EE, GS, LPS designated truck possesses sufficient safeguards for the location. Piping without valves, checks, meters and similar devices would not ordinarily be deemed to introduce a hazardous condition even though used for hazardous liquids or gases. Locations used for the storage of hazardous liquids or of liquefied or compressed gases in sealed containers would not normally be considered hazardous unless subject to other hazardous conditions also.

(i) Only approved power-operated industrial trucks designated as EX shall be used in atmospheres in which combustible dust is or may be in suspension continuously, intermittently, or periodically under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.

(ii) The EX classification usually includes the working areas of grain handling and storage plants, room containing grinders or pulverizers, cleaners, graders, scalpers, open conveyors or spouts, open bins or hoppers, mixers, or blenders, automatic or hopper scales, packing machinery, elevator heads and boots, stock distributors, dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in grain processing plants, starch plants, sugar pulverizing plants, malting plants, hay grinding plants, and other occupancies of similar nature; coal pulverizing plants (except where the pulverizing equipment is essentially dust tight); all working areas where metal dusts and powders are produced, processed, handled, packed, or stored (except in tight containers); and other similar locations where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

(e) Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in atmospheres in which combustible dust will not normally be in suspension in the air or will not be likely to be thrown

into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures but where deposits or accumulations of such dust may be ignited by arcs or sparks originating in the truck.

(f) Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in locations which 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.

(g) Only approved power-operated industrial trucks designated as DS, DY, ES, EE, EX, GS, or LPS shall be used in locations where easily ignitable fibers are stored or handled including outside storage, but are not being processed or manufactured. Industrial trucks designated as E, which have been previously used in these locations may be continued in use.

(h) On piers and wharves handling general cargo, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.

(i) If storage warehouses and outside storage locations are hazardous only the approved power-operated industrial truck specified for such locations in WAC 296-24-23007(2) shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.

(j) If general industrial or commercial properties are hazardous, only approved power-operated industrial trucks specified for such locations in this WAC 296-24-23007 shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements of these types may be used.

TABLE N-1

SUMMARY TABLE ON USE OF INDUSTRIAL TRUCKS IN VARIOUS LOCATIONS

[TABLE N-1: Part 1—Unclassified & Class I]

Classes	Unclassified	Class I locations			
Description of classes	Locations not possessing atmospheres as described in other columns.	Locations in which flammable gases or vapors are, or may be, present in the air in quantities sufficient to produce explosive or ignitable mixtures.			
Groups in classes	None	A	B	C	D
Examples of locations or atmospheres in classes and groups	Piers and Wharves inside and outside general storage General industrial or commercial properties	Acetylene	Hydrogen	Ethyl ether	Gasoline Naphtha Alcohols Acetone Lacquer solvent Benzene

[TABLE N-1: Part 1—Unclassified & Class I]

Classes	Unclassified	Class I locations	
		1	2
Divisions (Nature of Hazardous Conditions)	None	Above condition exists continuously, intermittently, or periodically under normal operating conditions.	Above condition may occur accidentally as due to a puncture of a storage drum.

[TABLE N-1: Part 2—Class II & III]

Classes	Class II locations			Class III locations	
Description of classes	Locations which are hazardous because of the presence of combustible dust.			Locations where easily ignitable fibers or flyings are present but not likely to be in suspension in quantities sufficient to produce ignitable mixtures.	
	Groups in classes	E	F	G	None
Examples of locations or atmospheres in classes and groups	Metal dust	Carbon black Coal Coke dust	Grain dust Flour dust Starch dust Organic dust	Baled waste, cocoa fiber, cotton, excelsior, hemp, istle, jute, kapok, oakum, sisal, Spanish moss, synthetic fibers, tow.	
Divisions (Nature of Hazardous Conditions)	Explosive mixture may be present under normal operating conditions, or where failure of equipment may cause the condition to exist simultaneously with arcing or sparking of electrical equipment, or where dusts of an electrically conducting nature may be present.		Explosive mixture not normally present, but where deposits of dust may cause heat rise in electrical equipment, or where such deposits may be ignited by arcs or sparks from electrical equipment.		Locations in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured, or used.
					Locations in which easily ignitable fibers are stored or handled (except in the process of manufacture).

Authorized Uses of trucks by types in groups of classes and divisions

[TABLE N-1: Part 3—
Groups in classes, None—A, B, C, and D]

Groups in classes	None	A	B	C	D	A	B	C	D
Types of trucks authorized:									
Diesel:									
Type D						D**			
Type DS									DS
Type DY									DY
Electric:									
Type E						E**			
Type ES									ES
Type EE									EE
Type EX							EX		EX
Gasoline:									
Type G						G**			
Type GS									GS
LP-Gas:									
Type LP						LP**			
Type LPS									LPS
Paragraph Ref. in No. 505	210.211	201(a)	203 (a)	209(a)	204 (a), (b)				

**Trucks conforming to these types may also be used—see WAC 296-24-23007(2)(h) and (j).
References in parentheses are to the corresponding classification as used in the National Electrical Code (NFPA No. 70, ANSI Standard CI-1968) for the convenience of persons familiar with those classifications.

[TABLE N-1: Part 4—
Groups in class—E, F, G, and None]

Groups in classes	E	F	G	E	F	G	None	None
Types of trucks authorized:								
Diesel:								
Type D								
Type DS							DS	DS
Type DY							DY	DY
Electric:								
Type E								E
Type ES							ES	ES
Type EE							EE	EE
Type EX							EX	EX
Gasoline:								
Type G								
Type GS							GS	GS
LP-Gas:								
Type LP								
Type LPS							LPS	LPS
Paragraph Ref. in No. 505	202(a)	205(a)	209(a)	206 (a), (b)	207(a)	208(a)		

**Trucks conforming to these Types may also be used — see WAC 296-24-23007(2)(h) and (j).
References in parentheses are to the corresponding classification as used in the National Electrical Code (NFPA No. 70, ANSI Standard CI-1968) for the convenience of persons familiar with those classifications.

[Order 73-5, § 296-24-23007, filed 5/9/73 and Order 73-4, § 296-24-23007, filed 5/7/73.]

WAC 296-24-23009 Converted industrial trucks. Power-operated industrial trucks that have been originally approved for the use of gasoline for fuel, when converted to the use of liquefied petroleum gas fuel in accordance with WAC 296-24-23035, may be used in those locations where G, GS or LP, and LPS designated trucks have been specified in the preceding sections. [Order 73-5, § 296-24-23009, filed 5/9/73 and Order 73-4, § 296-24-23009, filed 5/7/73.]

WAC 296-24-23011 Safety guards. (1) High Lift Rider trucks shall be fitted with an overhead guard manufactured in accordance with WAC 296-24-23003(2), unless operating conditions do not permit.

(2) If the type of load presents a hazard, the user shall equip fork trucks with a vertical load backrest extension manufactured in accordance with WAC 296-24-23003(2). [Order 73-5, § 296-24-23011, filed 5/9/73 and Order 73-4, § 296-24-23011, filed 5/7/73.]

WAC 296-24-23013 Fuel handling and storage. (1) The storage and handling of liquid fuels such as gasoline and diesel fuel shall be in accordance with NFPA Flammable and Combustible Liquids Code (NFPA No. 30-1969).

(2) The storage and handling of liquefied petroleum gas fuel shall be in accordance with NFPA Storage and Handling of Liquefied Petroleum Gases (NFPA No. 58-1969). [Order 73-5, § 296-24-23013, filed 5/9/73 and Order 73-4, § 296-24-23013, filed 5/7/73.]

WAC 296-24-23015 Changing and charging storage batteries. (1) Battery charging installations shall be located in areas designated for that purpose.

(2) Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

(3) When racks are used for support of batteries, they should be made of materials nonconductive to spark generation or be coated or covered to achieve this objective.

(4) A conveyor, overhead hoist, or equivalent material handling equipment shall be provided for handling batteries.

(5) Reinstalled batteries shall be properly positioned and secured in the truck.

(6) A carboy tilter or siphon shall be provided for handling electrolyte.

(7) When charging batteries, acid shall be poured into water; water shall not be poured into acid.

(8) Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.

(9) When charging batteries, the vent caps should be kept in place to avoid electrolyte spray. Care shall be taken to assure that vent caps are functioning. The battery (or compartment) cover(s) shall be open to dissipate heat.

(10) Smoking shall be prohibited in the charging area.

(11) Precautions shall be taken to prevent open flames, sparks, or electric arcs in battery charging areas.

(12) Tools and other metallic objects shall be kept away from the top of uncovered batteries. [Order 73-5, § 296-24-23015, filed 5/9/73 and Order 73-4, § 296-24-23015, filed 5/7/73.]

WAC 296-24-23017 Lighting for operating areas.

(1) Controlled lighting of adequate intensity should be provided in operating areas. (See American National Standard Practice for Industrial Lighting, All.1-1965 (R1970)).

(2) Where general lighting is less than 2 lumens per square foot, auxiliary directional lighting shall be provided on the truck. [Order 73-5, § 296-24-23017, filed 5/9/73 and Order 73-4, § 296-24-23017, filed 5/7/73.]

WAC 296-24-23019 Control of noxious gases and fumes. (1) Concentration levels of carbon monoxide gas created by powered industrial truck operations shall not exceed the levels specified in WAC 296-62-075 (General Occupational Health Standards).

(2) Questions concerning degree of concentration and methods of sampling to ascertain the conditions should be referred to a qualified industrial hygienist. [Order 73-5, § 296-24-23019, filed 5/9/73 and Order 73-4, § 296-24-23019, filed 5/7/73.]

WAC 296-24-23021 Dockboards (bridge plates). (1)

Portable and powered dockboards shall be strong enough to carry the load imposed on them.

(2) Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.

(3) Powered dockboards shall be designed and constructed in accordance with Commercial Standard CS202-56 (1956) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce.

(4) Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

(5) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position. [Order 73-5, § 296-24-23021, filed 5/9/73 and Order 73-4, § 296-24-23021, filed 5/7/73.]

WAC 296-24-23023 Trucks and railroad cars. (1)

The brakes of highway trucks shall be set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.

(2) Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations.

(3) Fixed jacks may be necessary to support a semitrailer and prevent up-ending during the loading or unloading when the trailer is not coupled to a tractor.

(4) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position. [Order 73-5, § 296-24-23023, filed 5/9/73 and Order 73-4, § 296-24-23023, filed 5/7/73.]

WAC 296-24-23025 Operator training. Only trained and authorized operators shall be permitted to operate a powered industrial truck. Methods shall be devised to train operators in the safe operation of powered industrial trucks. [Order 73-5, § 296-24-23025, filed 5/9/73 and Order 73-4, § 296-24-23025, filed 5/7/73.]

WAC 296-24-23027 Truck operations. (1) Trucks shall not be driven up to anyone standing in front of a bench or other fixed object.

(2) No person shall be allowed to stand or pass under the elevated portion of any truck, whether loaded or empty.

(3) Unauthorized personnel shall not be permitted to ride on powered industrial trucks. A safe place to ride shall be provided where riding of trucks is authorized.

(4) The employer shall prohibit arms or legs from being placed between the uprights of the mast or outside the running lines of the truck.

(5) When leaving a powered industrial truck unattended, load engaging means shall be fully lowered, controls shall be neutralized, power shall be shut off, and brakes set. Wheels blocked if the truck is parked on an incline. (a) 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.

(b) 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.

(6) A safe distance shall be maintained from the edge of ramps or platforms while on any elevated dock, or platform or freight car. Trucks shall not be used for opening or closing freight doors.

(7) Brakes shall be set and wheel blocks shall be in place to prevent movement of trucks, trailers, or railroad cars while loading or unloading. Fixed jacks may be necessary to support a semitrailer during loading or unloading when the trailer is not coupled to a tractor. The flooring of trucks, trailers, and railroad cars shall be checked for breaks and weakness before they are driven onto.

(8) There shall be sufficient headroom under overhead installations, lights, pipes, sprinkler system, etc.

(9) An overhead guard shall be used as protection against falling objects. It should be noted that an overhead guard is intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application, but not to withstand the impact of a falling capacity load.

(10) A load backrest extension shall be used whenever necessary to minimize the possibility of the load or part of it from falling rearward.

(11) Only approved industrial trucks shall be used in hazardous locations.

(12) Whenever a truck is equipped with vertical only, or vertical and horizontal controls elevatable with the lifting carriage or forks for lifting personnel, the following additional precautions shall be taken for the protection of personnel being elevated.

(a) Use of a safety platform firmly secured to the lifting carriage and/or forks.

(b) Means shall be provided whereby personnel on the platform can shut off power to the truck.

(c) Such protection from falling objects as indicated necessary by the operating conditions shall be provided.

(13) 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.

(14) Fire aisles, access to stairways, and fire equipment shall be kept clear. [Order 74-27, § 296-24-23027, filed 5/7/74; Order 73-5, § 296-24-23027, filed 5/9/73 and Order 73-4, § 296-24-23027, filed 5/7/73.]

WAC 296-24-23029 Traveling. (1) All traffic regulations shall be observed, including authorized plant speed limits. A safe distance shall be maintained approximately three truck lengths from the truck ahead, and the truck shall be kept under control at all times.

(2) The right of way shall be yielded to ambulances, fire trucks, or other vehicles in emergency situations.

(3) Other trucks traveling in the same direction at intersections, blind spots, or other dangerous locations shall not be passed.

(4) The driver shall be required to slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.

(5) Railroad tracks shall be crossed diagonally wherever possible. Parking closer than 8 feet from the center of railroad tracks is prohibited.

(6) The driver shall be required to look in the direction of, and keep a clear view of the path of travel.

(7) Grades shall be ascended or descended slowly.

(a) When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.

(b) Unloaded trucks should be operated on all grades with the load engaging means downgrade.

(c) On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(8) Under all travel conditions the truck shall be operated at a speed that will permit it to be brought to a stop in a safe manner.

(9) Stunt driving and horseplay shall not be permitted.

(10) The driver shall be required to slow down for wet and slippery floors.

(11) Dockboard or bridgeplates, shall be properly secured before they are driven over. Dockboard or bridgeplates shall be driven over carefully and slowly and their rated capacity never exceeded.

(12) Elevators shall be approached slowly, and then entered squarely after the elevator car is properly leveled. Once on the elevator, the controls shall be neutralized, power shut off, and the brakes set.

(13) Motorized hand trucks must enter elevator or other confined areas with load end forward.

(14) Running over loose objects on the roadway surface shall be avoided.

(15) While negotiating turns, speed shall be reduced to a safe level, by means of turning the hand steering wheel in a smooth, sweeping motion. Except when maneuvering at a very low speed, the hand steering wheel shall be turned at a moderate, even rate. [Order 73-5, § 296-24-23029, filed 5/9/73 and Order 73-4, § 296-24-23029, filed 5/7/73.]

WAC 296-24-23031 Loading. (1) Only stable or safely arranged loads shall be handled. Caution shall be exercised when handling off-center loads which cannot be centered.

(2) Only loads within the rated capacity of the truck shall be handled.

(3) The long or high (including multiple-tiered) loads which may affect capacity shall be adjusted.

(4) When attachments are used, particular care should be taken in securing, manipulating, positioning, and transporting the load. Trucks equipped with attachments shall be operated as partially loaded trucks when not handling a load.

(5) A load engaging means shall be placed under the load as far as possible; the mast shall be carefully tilted backward to stabilize the load.

(6) Extreme care shall be used when tilting the load forward or backward, particularly when high tiering. Tilting forward with load engaging means elevated shall be prohibited except to pick up a load. An elevated load shall not be tilted forward except when the load is in a deposit position over a rack or stack. When stacking or tiering, only enough backward tilt to stabilize the load shall be used. [Order 73-5, § 296-24-23031, filed 5/9/73 and Order 73-4, § 296-24-23031, filed 5/7/73.]

WAC 296-24-23033 Operation of the truck. (1) If at any time a powered industrial truck is found to be in need of repair, defective, or in any way unsafe, the truck shall be taken out of service until it has been restored to safe operating condition.

(2) Fuel tanks shall not be filled while the engine is running. Spillage shall be avoided.

(3) Spillage of oil or fuel shall be carefully washed away or completely evaporated and the fuel tank cap replaced before restarting engine.

(4) No truck shall be operated with a leak in the fuel system until the leak has been corrected.

(5) Open flames shall not be used for checking electrolyte level in storage batteries or gasoline level in fuel tanks. [Order 73-5, § 296-24-23033, filed 5/9/73 and Order 73-4, § 296-24-23033, filed 5/7/73.]

WAC 296-24-23035 Maintenance of industrial trucks. (1) Any power operated industrial truck not in safe operating condition shall be removed from service. All repairs shall be made by authorized personnel.

(2) No repairs shall be made in Classes I, II, and III locations.

(3) Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.

(4) Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.

(5) All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.

(6) Industrial trucks shall not be altered so that the relative positions of the various parts are different from what they were when originally received from the manufacturer, nor shall they be altered either by the addition of extra parts not provided by the manufacturer or by the elimination of any parts, except as provided in WAC 296-24-23003. Additional counterweighting of fork trucks shall not be done unless approved by the truck manufacturer.

(7) Industrial trucks shall be examined before being placed in service, and shall not be placed in service if the examination shows any condition adversely affecting the safety of the vehicle. Such examination shall be made at least daily.

Where industrial trucks are used on a round-the-clock basis, they shall be examined after each shift. Defects when found shall be immediately reported and corrected.

(8) Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service, and not returned to service until the cause for the emission of such sparks and flames has been eliminated.

(9) When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.

(10) Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible

agents should be used for cleaning trucks. Low flash point (below 100°F.) solvents shall not be used. High flash point (at or above 100°F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.

(11) Where it is necessary to use antifreeze in the engine cooling system, only those products having glycol base shall be used.

(12) Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks. Such conversion equipment shall be approved. The description of the component parts of this conversion system and the recommended method of installation on specific trucks are contained in the "Listed by Report". [Order 73-5, § 296-24-23035, filed 5/9/73 and Order 73-4, § 296-24-23035, filed 5/7/73.]

WAC 296-24-233 Motor vehicle trucks and trailers.

(1) Only qualified drivers shall be permitted to operate motor vehicle trucks, and shall possess a current Motor Vehicle Operator's License.

(2) Motor vehicle trucks must be equipped with brakes which will safely hold the maximum load on maximum grades.

(3) Trailers must be equipped with good, workable air brakes, or other type of brake equipment approved by the State Commission on Equipment. Air must be cut into the trailer brake system at the time that the trailer is coupled to the truck.

(4) Brakes on trucks and trailers must be tested before equipment descends a steep grade.

(5) Truck drivers shall at all times operate equipment at a safe speed for roadway conditions.

(6) Safe methods of loading and unloading motor vehicle trucks and trailers shall be observed at all times.

(7) To prevent accidents during the backing of trucks where vision is obstructed, a signalman shall be stationed at a point giving him a clear view of the rear of the truck and the operator of the truck at all times.

(8) Truck drivers shall sound their horn before starting to back, and shall sound the horn intermittently during the entire backing operation.

(9) Dump trucks shall have a device installed on the frame which will be of sufficient strength to hold the bed in the raised position when employees are working in an exposed position underneath.

(10) All parts and accessories of trucks and trailers shall be kept in good repair and safe condition. Tires worn beyond the point of safety shall not be used.

(11) All motor vehicle trucks and trailers shall be equipped with standard lights, horn, flags, flares, etc., to conform to the State of Washington Motor Vehicles Laws.

(12) All loads transported on trucks and/or trucks and trailers shall be properly secured and distributed, and limited to a safe operating load for the condition of the roadway, and the capacity of the bridges, trestles, and other structures.

(13) Precautions to be taken while inflating tires. Un-mounted 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.

(14) Trucks parked on an incline shall have the steered wheels turned into the curb and shall have at least one (1) "driver" wheel chocked on each side, independent of the braking system.

(15) Motor vehicles used regularly for transportation of workmen shall be well equipped, covered against the weather and maintained in good mechanical condition at all times.

(a) Seats, which shall be properly secured, shall be provided in each vehicle to accommodate the total number of workers normally transported. Where it becomes necessary under emergency conditions to transport more workers than the seating capacity of the truck will accommodate, all workers not having seats shall ride within the vehicle. Under no circumstances shall workers ride on fenders or running boards of the vehicle.

(b) No worker shall ride in or on any vehicle with his legs hanging over the end or sides. A safety bar should be placed across the rear opening of all manhaul trucks which are not equipped with tail gates.

(c) Vehicles shall be equipped with compartments or screen of such strength to retain sharp tools which could present a hazard to employees being transported.

(d) All dump-trucks used to transport workers shall be equipped with an adequate safety chain or locking device which will eliminate the possibility of the body of the truck being raised while workers are riding in the truck.

(e) Explosives or highly inflammable materials shall not be carried in or on any vehicle while it is used to transport workers.

(f) Exhaust systems shall be installed and maintained in proper condition, and shall be so designed as to eliminate the exposure of the workers to the exhaust gases and fumes.

(g)(i) The number of persons allowed in the cab of a single bench seat crew truck shall not exceed two (2) in addition to the driver. Crew trucks designed and constructed with additional seating capacity behind the normal driver's seat may carry additional passengers in the seating area behind the driver's seat. Crew trucks with bucket-type seats may carry only the number of passengers for which the bucket seats are provided. In any seating arrangement, the driver must be able to maintain full freedom of motion. Additionally, the number of passengers or seating arrangement shall not obstruct the driver's normal vision.

(ii) When trucks are designed and constructed with larger than normal seating capacity in the front seat, the total number of passengers may be increased provided that the operator's vision and control functions, as required in (15)(g)(i), are maintained.

(h) All enclosed crew trucks shall have an emergency exit in addition to the regular entrance.

(i) Trucks used for hauling gravel shall not be used as crew trucks unless they are equipped as follows:

(i) Steps in proper place or places.

(ii) Wooden floors.

(iii) Seats are securely fastened.

(iv) Truck is properly covered.

(v) All other general regulations covering crew trucks are fully conformed with.

(j) Half-ton vehicles shall haul not more than six persons including driver. Three-quarter-ton vehicles shall haul not more than eight persons including driver.

(k) All vehicles carrying crews shall be equipped with stretchers and fire extinguishers.

(l) No heating units in which there are open fires shall be used in vehicles transporting crews. [Order 76-29, § 296-24-233, filed 9/30/76; Order 76-6, § 296-24-233, filed 3/1/76; Order 75-11, § 296-24-233, filed 4/4/75; Order 74-27, § 296-24-233, filed 5/7/74; Order 73-5, § 296-24-233, filed 5/9/73 and Order 73-4, § 296-24-233, filed 5/7/73.]

WAC 296-24-235 Overhead and gantry cranes. [Order 73-5, § 296-24-235, filed 5/9/73 and Order 73-4, § 296-24-235, filed 5/7/73.]

WAC 296-24-23501 Definitions. (1) A "crane" is a machine for lifting and lowering a load and moving it horizontally, with the hoisting mechanism and integral part of the machine. Cranes whether fixed or mobile are driven manually or by power.

(2) An "automatic crane" is a crane which when activated operates through a preset cycle or cycles.

(3) A "cab-operated crane" is a crane controlled by an operator in a cab located on the bridge or trolley.

(4) "Cantilever gantry crane" means a gantry or semigantry crane in which the bridge girders or trusses extend transversely beyond the crane runway on one or both sides.

(5) "Floor-operated crane" means a crane which is pendant or nonconductive rope controlled by an operator on the floor or an independent platform.

(6) "Gantry crane" means a crane similar to an overhead crane except that the bridge for carrying the trolley or trolleys is rigidly supported on two or more legs running on fixed rails or other runway.

(7) "Hot metal handling crane" means an overhead crane used for transporting or pouring molten material.

(8) "Overhead crane" means a crane with a movable bridge carrying a movable or fixed hoisting mechanism and traveling on an overhead fixed runway structure.

(9) "Power-operated crane" means a crane whose mechanism is driven by electric, air, hydraulic, or internal combustion means.

(10) A "pulpit-operated crane" is a crane operated from a fixed operator station not attached to the crane.

(11) A "remote-operated crane" is a crane controlled by an operator not in a pulpit or in the cab attached to the crane, by any method other than pendant or rope control.

(12) A "semigantry crane" is a gantry crane with one end of the bridge rigidly supported on one or more legs that run on a fixed rail or runway, the other end of the bridge being supported by a truck running on an elevated rail or runway.

(13) "Storage bridge crane" means a gantry type crane of long span usually used for bulk storage of material; the bridge girders or trusses are rigidly or nonrigidly supported on one or more legs. It may have one or more fixed or hinged cantilever ends.

(14) "Wall crane" means a crane having a jib with or without trolley and supported from a side wall or line of columns of a building. It is a traveling type and operates on a runway attached to the side wall or columns.

(15) "Appointed" means assigned specific responsibilities by the employer or the employer's representative.

(16) "ANSI" means the American National Standards Institute.

(17) An "auxiliary hoist" is a supplemental hoisting unit of lighter capacity and usually higher speed than provided for the main hoist.

(18) A "brake" is a device used for retarding or stopping motion by friction or power means.

(19) A "drag brake" is a brake which provides retarding force without external control.

(20) A "holding brake" is a brake that automatically prevents motion when power is off.

(21) "Bridge" means that part of a crane consisting of girders, trucks, end ties, footwalks, and drive mechanism which carries the trolley or trollies.

(22) "Bridge travel" means the crane movement in a direction parallel to the crane runway.

(23) A "bumper" (buffer) is an energy absorbing device for reducing impact when a moving crane or trolley reaches the end of its permitted travel; or when two moving cranes or trollies come in contact.

(24) The "cab" is the operator's compartment on a crane.

(25) "Clearance" means the distance from any part of the crane to a point of the nearest obstruction.

(26) "Collectors" (current) are contacting devices for collecting current from runway or bridge conductors.

(27) "Conductors, bridge" are the electrical conductors located along the bridge structure of a crane to provide power to the trolley.

(28) "Conductors, runway" (main) are the electrical conductors located along a crane runway to provide power to the crane.

(29) The "control braking means" is a method of controlling crane motor speed when in an overhauling condition.

(30) "Countertorque" means a method of control by which the power to the motor is reversed to develop torque in the opposite direction.

(31) "Dynamic" means a method of controlling crane motor speeds when in the overhauling condition to provide a retarding force.

(32) "Regenerative" means a form of dynamic braking in which the electrical energy generated is fed back into the power system.

(33) "Mechanical" means a method of control by friction.

(34) "Controller, spring return" means a controller which when released will return automatically to a neutral position.

(35) "Designated" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

(36) A "drift point" means a point on a travel motion controller which releases the brake while the motor is not energized. This allows for coasting before the brake is set.

(37) The "drum" is the cylindrical member around which the ropes are wound for raising or lowering the load.

(38) An "equalizer" is a device which compensates for unequal length or stretch of a rope.

(39) "Exposed" means capable of being contacted inadvertently. Applied to hazardous objects not adequately guarded or isolated.

(40) "Fail-safe" means a provision designed to automatically stop or safely control any motion in which a malfunction occurs.

(41) "Footwalk" means the walkway with handrail, attached to the bridge or trolley for access purposes.

(42) A "hoist" is an apparatus which may be a part of a crane, exerting a force for lifting or lowering.

(43) "Hoist chain" means the load bearing chain in a hoist.

NOTE: Chain properties do not conform to those shown in ANSI B30.9-1971, Safety Code for Slings.

(44) "Hoist motion" means that motion of a crane which raises and lowers a load.

(45) "Load" means the total superimposed weight on the load block or hook.

(46) The "load block" is the assembly of hook or shackle, swivel, bearing, sheaves, pins, and frame suspended by the hoisting rope.

(47) "Magnet" means an electromagnetic device carried on a crane hook to pick up loads magnetically.

(48) "Main hoist" means the hoist mechanism provided for lifting the maximum rated load.

(49) A "man trolley" is a trolley having an operator's cab attached thereto.

(50) "Rated load" means the maximum load for which a crane or individual hoist is designed and built by the manufacturer and shown on the equipment nameplate(s).

(51) "Rope" refers to wire rope, unless otherwise specified.

(52) "Running sheave" means a sheave which rotates as the load block is raised or lowered.

(53) "Runway" means an assembly of rails, beams, girders, brackets, and framework on which the crane or trolley travels.

(54) "Side pull" means that portion of the hoist pull acting horizontally when the hoist lines are not operated vertically.

(55) "Span" means the horizontal distance center to center of runway rails.

(56) "Standby crane" means a crane which is not in regular service but which is used occasionally or intermittently as required.

(57) A "stop" is a device to limit travel of a trolley or crane bridge. This device normally is attached to a fixed

structure and normally does not have energy absorbing ability.

(58) A "switch" is a device for making, breaking, or for changing the connections in an electric circuit.

(59) An "emergency stop switch" is a manually or automatically operated electric switch to cut off electric power independently of the regular operating controls.

(60) A "limit switch" is a switch which is operated by some part or motion of a power-driven machine or equipment to alter the electric circuit associated with the machine or equipment.

(61) A "main switch" is a switch controlling the entire power supply to the crane.

(62) A "master switch" is a switch which dominates the operation of contractors, relays, or other remotely operated devices.

(63) The "trolley" is the unit which travels on the bridge rails and carries the hoisting mechanism.

(64) "Trolley travel" means the trolley movement at right angles to the crane runway.

(65) "Truck" means the unit consisting of a frame, wheels, bearings, and axles which supports the bridge girders or trolleys. [Order 73-5, § 296-24-23501, filed 5/9/73 and Order 73-4, § 296-24-23501, filed 5/7/73.]

WAC 296-24-23503 General requirements. (1) Application. This section applies to overhead and gantry cranes, including semigantry, cantilever gantry, wall cranes, storage bridge cranes, and others having the same fundamental characteristics. These cranes are grouped because they all have trolleys and similar travel characteristics.

(2) New and Existing Equipment. All new overhead and gantry cranes constructed and installed on or after the effective date of these standards, shall meet the design specifications of the American National Standard Safety Code for Overhead and Gantry Cranes, ANSI B30.2.0-1967. Overhead and gantry cranes constructed before the effective date of these standards, should be modified to conform to those design specifications, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section. (See WAC 296-24-010 VARIANCE AND PROCEDURE).

(3) Modifications. Cranes may be modified and rerated provided such modifications and the supporting structure are checked thoroughly for the new rated load by a qualified engineer or the equipment manufacturer. The crane shall be tested in accordance with WAC 296-24-23521(2). New rated load shall be displayed in accordance with (5) of this section.

(4) Wind Indicators and Rail Clamps. Outdoor storage bridges shall be provided with automatic rail clamps. A wind-indicating device shall be provided which will give a visible or audible alarm to the bridge operator at a predetermined wind velocity. If the clamps act on the rail heads, any beads or weld flash on the rail heads shall be ground off.

(a) Calculations for wind pressure on outside overhead traveling cranes shall be based on not less than 30 pounds per square foot of exposed surface.

(5) Rated Load Marking. 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.

(6) Clearance from Obstruction. (a) Minimum clearance of 3 inches overhead and 2 inches laterally shall be provided and maintained between crane and obstructions in conformity with Specification No. 61 Crane Manufacturers Association of America, Inc., Thomas Circle NW, Washington, D.C. 20005.

(b) Where passageways or walkways are provided obstructions shall not be placed so that safety of personnel will be jeopardized by movements of the crane.

(7) Clearance Between Parallel Cranes. If the runways of two cranes are parallel, and there are no intervening walls or structure, there shall be adequate clearance provided and maintained between the two bridges.

(8) Designated personnel. Only designated personnel shall be permitted to operate a crane covered by this section. [Order 74-27, § 296-24-23503, filed 5/7/74; Order 73-5, § 296-24-23503, filed 5/9/73 and Order 73-4, § 296-24-23503, filed 5/7/73.]

WAC 296-24-23505 Cabs. (1) Cab Location. (a) The general arrangement of the cab and the location of control and protective equipment shall be such that all operating handles are within convenient reach of the operator when facing the area to be served by the load hook, or while facing the direction of travel of the cab. The arrangement shall allow the operator a full view of the load hook in all positions.

(b) The cab shall be located to afford a minimum of 3 inches clearance from all fixed structures within its area of possible movement.

(c) The clearance of the cab above the working floor or passageway should be not less than seven feet (7').

(2) Access to Crane. Access to the cab and/or bridge walkway shall be by a conveniently placed fixed ladder, stairs, or platform, requiring no step over any gap exceeding 12 inches. Fixed ladders shall be in conformance with the American National Standard Safety Code for Fixed Ladders, ANSI A14.3-1956.

(3) Fire Extinguisher. A carbon dioxide, dry-chemical, or equivalent hand fire extinguisher should be kept in the cab. Carbon tetrachloride extinguishers shall not be used.

(4) Lighting. Light in the cab shall be sufficient to enable the operator to see clearly enough to perform his work. [Order 73-5, § 296-24-23505, filed 5/9/73 and Order 73-4, § 296-24-23505, filed 5/7/73.]

WAC 296-24-23507 Footwalks and ladders. (1) Location of Footwalks. (a) If sufficient headroom is available on cab-operated cranes, a footwalk shall be provided on the drive side along the entire length of the bridge of all cranes having the trolley running on the top of the girders. To give sufficient access to the opposite side of the trolley, there should be provided either a footwalk mounted on the trolley, a suitable footwalk or

platform in the building, or a footwalk on the opposite side of the crane at least twice the length of the trolley.

(b) Footwalks should be located to give a headroom not less than 78 inches. In no case shall less than 48 inches be provided. If 48 inches of headroom cannot be provided, footwalks should be omitted from the crane and a stationary platform or landing stage built for workmen making repairs.

(2) Construction of Footwalks. (a) Footwalks shall be of rigid construction and designed to sustain a distributed load of at least 50 pounds per square foot.

(b) Footwalks shall have a walking surface of antislip type.

NOTE: Wood will meet this requirement.

(c) Footwalks should be continuous and permanently secured.

(d) Footwalks should have a clear passageway at least 18 inches wide except opposite the bridge motor, where they should be not less than 15 inches. The inner edge shall extend at least to the line of the outside edge of the lower cover plate or flange of the girder.

(3) Toeboards and Handrails for Footwalks. Toeboards and handrails shall be in compliance with WAC 296-24-750 through WAC 296-24-75011.

(4) Ladders and Stairways. (a) Gantry cranes shall be provided with ladders or stairways extending from the ground to the footwalk or cab platform.

(b) Stairways shall be equipped with rigid and substantial metal handrails. Walking surfaces shall be of an antislip type.

(c) Ladders shall be permanently and securely fastened in place and shall be constructed in compliance with WAC 296-24-810 through WAC 296-24-81011. [Order 73-5, § 296-24-23507, filed 5/9/73 and Order 73-4, § 296-24-23507, filed 5/7/73.]

WAC 296-24-23509 Stops, bumpers, rail sweeps, and guards. (1) Trolley Stops. (a) Stops shall be provided at the limits of travel of the trolley.

(b) Stops shall be fastened to resist forces applied when contacted.

(c) A stop engaging the tread of the wheel shall be of a height at least equal to the radius of the wheel.

(2) Bridge bumpers. (a) A crane shall be provided with bumpers or other automatic means providing equivalent effect, unless the crane travels at a slow rate of speed and has a faster deceleration rate due to the use of sleeve bearings, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance by the nature of the crane operation and there is no hazard of striking any object in this limited distance or is used in similar operating conditions. The bumpers shall be capable of stopping the crane (not including the lifted load) at an average rate of deceleration not to exceed 3 ft/s/s when traveling in either direction at 20 percent of the rated load speed.

(i) The bumpers shall have sufficient energy absorbing capacity to stop the crane when traveling at a speed of at least 40 percent of rated load speed.

(ii) The bumpers shall be so mounted that there is no direct shear on bolts.

(iii) Bumpers shall be so designed and installed as to minimize parts falling from the crane in case of breakage.

(3) Trolley bumpers. (a) A trolley shall be provided with bumpers or other automatic means of equivalent effect, unless the trolley travels at a slow rate of speed, or is not operated near the ends of bridge and trolley travel, or is restricted to a limited distance of the runway and there is no hazard of striking any object in this limited distance, or is used in similar operating conditions. The bumpers shall be capable of stopping the trolley (not including the lifted load) at an average rate of deceleration not to exceed 4.7 ft./s/s when traveling in either direction at one-third of the rated load speed.

(i) When more than one trolley is operated on the same bridge, each shall be equipped with bumpers or equivalent on their adjacent ends.

(b) Bumpers or equivalent shall be designed and installed to minimize parts falling from the trolley in case of age.

(4) Rail Sweeps. Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the truck wheels.

(5) Guards for Hoisting Ropes. (a) If hoisting ropes run near enough to other parts to make fouling or chafing possible, guards shall be installed to prevent this condition.

(b) A guard shall be provided to prevent contact between bridge conductors and hoisting ropes if they could come into contact.

(6) Guards for Moving Parts. (a) Exposed moving parts such as gears, set screws, projecting keys, chains, chain sprockets, and reciprocating components which might constitute a hazard under normal operating conditions shall be guarded.

(b) Guards shall be securely fastened.

(c) Each guard shall be capable of supporting without permanent distortion the weight of a 200-pound person unless the guard is located where it is impossible for a person to step on it. [Order 74-27, § 296-24-23509, filed 5/7/74; Order 73-5, § 296-24-23509, filed 5/9/73 and Order 73-4, § 296-24-23509, filed 5/7/73.]

WAC 296-24-23511 Brakes. (1) Brakes for Hoists. (a) Each independent hoisting unit of a crane shall be equipped with at least one self-setting brake, hereafter referred to as a holding brake, applied directly to the motor shaft or some part of the gear train.

(b) Each independent hoisting unit of a crane, except worm-gear hoists, the angle of whose worm is such as to prevent the load from accelerating in the lowering direction shall, in addition to a holding brake, be equipped with control braking means to prevent overspeeding.

(2) Holding Brakes. (a) Holding brakes for hoist motors shall have not less than the following percentage of the full load hoisting torque at the point where the brake is applied.

(i) 125 percent when used with a control braking means other than mechanical.

(ii) 100 percent when used in conjunction with a mechanical control braking means.

(iii) 100 percent each if two holding brakes are provided.

(b) Holding brakes on hoists shall have ample thermal capacity for the frequency of operation required by the service.

(c) Holding brakes on hoists shall be applied automatically when power is removed.

(d) Where necessary holding brakes shall be provided with adjustment means to compensate for wear.

(e) The wearing surface of all holding-brake drums or discs shall be smooth.

(f) Each independent hoisting unit of a crane handling hot metal and having power control braking means shall be equipped with at least two holding brakes.

(3) Control Braking Means. (a) A power control braking means such as regenerative, dynamic or countertorque braking, or a mechanically controlled braking means shall be capable of maintaining safe lowering speeds of rated loads.

(b) The control braking means shall have ample thermal capacity for the frequency of operation required by service.

(4) Brakes for Trolleys and Bridges. (a) Foot operated brakes shall not require an applied force of more than 70 pounds to develop manufacturer's rated brake torque.

(b) Brakes may be applied by mechanical, electrical, pneumatic, hydraulic, or gravity means.

(c) Where necessary brakes shall be provided with adjustment means to compensate for wear.

(d) The wearing surface of all brake drums or discs shall be smooth.

(e) All foot-brake pedals shall be constructed so that the operator's foot will not easily slip off the pedal.

(f) Foot-operated brakes shall be equipped with automatic means for positive release when pressure is released from the pedal.

(g) Brakes for stopping the motion of the trolley or bridge shall be of sufficient size to stop the trolley or bridge within a distance in feet equal to 10 percent of full load speed in feet per minute when traveling at full speed with full load.

(h) If holding brakes are provided on the bridge or trolley(s), they shall not prohibit the use of a drift point in the control circuit.

(i) Brakes on trolleys and bridges shall have ample thermal capacity for the frequency of operation required by the service to prevent impairment of functions from overheating.

(5) Application of Trolley Brakes. (a) On cab-operated cranes with cab on trolley, a trolley brake shall be required as specified under (4) of this section.

(b) A drag brake may be applied to hold the trolley in a desired position on the bridge and to eliminate creep with the power off.

(6) Application of Bridge Brakes. (a) On cab-operated cranes with cab on bridge, a bridge brake is required as specified under (4) of this section.

(b) On cab-operated cranes with cab on trolley, a bridge brake of the holding type shall be required.

(c) On all floor, remote and pulpit-operated crane bridge drives, a brake or noncoasting mechanical drive shall be provided. [Order 73-5, § 296-24-23511, filed

5/9/73 and Order 73-4, § 296-24-23511, filed 5/7/73.]

WAC 296-24-23513 Electric equipment. (1) General. (a) Wiring and equipment shall comply with Chapter 296-45 WAC and The State of Washington Electrical Construction Code.

(b) The control circuit voltage shall not exceed 600 volts for a.c. or d.c. current.

(c) The voltage at pendant pushbuttons shall not exceed 150 volts for a.c. and 300 volts for d.c.

(d) Where multiple conductor cable is used with a suspended pushbutton station, the station shall be supported in a manner that will protect the electrical conductors against strain.

(e) Pendant control boxes shall be constructed to prevent electrical shock and shall be clearly marked for identification of functions.

(2) Equipment. (a) Electrical equipment shall be so located or enclosed that live parts will not be exposed to accidental contact under normal operating conditions.

(b) Electric equipment shall be protected from dirt, grease, oil, and moisture.

(c) Guards for live parts shall be substantial and so located that they cannot be accidentally deformed so as to make contact with the live parts.

(3) Controllers. (a) Cranes not equipped with spring-return controllers or momentary contact pushbuttons shall be provided with a device which will disconnect all motors from the line on failure of power and will not permit any motor to be restarted until the controller handle is brought to the "off" position, or a reset switch or button is operated.

(b) Lever operated controllers shall be provided with a notch or latch which in the "off" position prevents the handle from being inadvertently moved to the "on" position. An "off" detent or spring return arrangement is acceptable.

(c) The controller operating handle shall be located within convenient reach of the operator.

(d) As far as practicable, the movement of each controller handle shall be in the same general directions as the resultant movements of the load.

(e) The control for the bridge and trolley travel shall be so located that the operator can readily face the direction of travel.

(f) For floor-operated cranes, the controller or controllers if rope operated, shall automatically return to the "off" position when released by the operator.

(g) Pushbuttons in pendant stations shall return to the off position when pressure is released by the crane operator.

(h) Automatic cranes shall be so designed that all motions shall fail-safe if any malfunction of operation occurs.

(i) Remote-operated cranes shall function so that if the control signal for any crane motion becomes ineffective the crane motion shall stop.

(4) Resistors. (a) Enclosures for resistors shall have openings to provide adequate ventilation, and shall be installed to prevent the accumulation of combustible matter near hot parts.

(b) Resistor units shall be supported so as to be free as possible from vibration.

(c) Provision shall be made to prevent broken parts or molten metal falling upon the operator or from the crane.

(5) Switches. (a) The power supply to the runway conductors shall be controlled by a switch or circuit breaker located on a fixed structure, accessible from the floor, and arranged to be locked in the open position.

(b) On cab-operated cranes a switch or circuit breaker of the enclosed type, with provision for locking in the open position shall be provided in the leads from the runway conductors. A means of opening this switch or circuit breaker shall be located within easy reach of the operator.

(c) On floor-operated cranes, a switch or circuit breaker of the enclosed type, with provision for locking in the open position, shall be provided in the leads from the runway conductors. This disconnect shall be mounted on the bridge or footwalk near the runway collectors. One of the following types of floor operated disconnects shall be provided:

(i) Nonconductive rope attached to the main disconnect switch.

(ii) An undervoltage trip for the main circuit breaker operated by an emergency stop button in the pendant pushbutton station.

(iii) A main line contactor operated by a switch or pushbutton in the pendant pushbutton station.

(d) The hoisting motion of all electric traveling cranes shall be provided with an overtravel limit switch in the hoisting direction.

(e) All cranes using a lifting magnet shall have a magnet circuit switch of the enclosed type with provision for locking in the open position. Means for discharging the inductive load of the magnet shall be provided.

(6) Runway Conductors. Conductors of the open type mounted on the crane runway beams or overhead shall be so located or so guarded that persons entering or leaving the cab or crane footwalk normally could not come into contact with them.

(7) Extension Lamps. If a service receptacle is provided in the cab or on the bridge of cab-operated cranes, it shall be a grounded three-prong type permanent receptacle, not exceeding 300 volts.

(8) Floor Operated Cranes. (a) An unobstructed aisle not less than three feet (3') 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.

(b) The handles of control ropes shall be distinctly different in contour so that, without looking, the operator will know which is the hoisting and which is the lowering handle. The direction of all movements of the crane shall be clearly indicated in some manner so that the operator can easily become familiar with them.

(c) When repairing runways, repairmen shall place rail stops and warning signs or signals so as to protect both ends of the section to be repaired.

(d) Repairmen shall take care to prevent loose parts from falling or being thrown upon the floor beneath.

[Order 73-5, § 296-24-23513, filed 5/9/73 and Order 73-4, § 296-24-23513, filed 5/7/73.]

WAC 296-24-23515 Hoisting equipment. (1)

Sheaves. (a) Sheave grooves shall be smooth and free from surface defects which could cause rope damage.

(b) Sheaves carrying ropes which can be momentarily unloaded shall be provided with close-fitting guards or other suitable devices to guide the rope back into the groove when the load is applied again.

(c) The sheaves in the bottom block shall be equipped with close-fitting guards that will prevent ropes from becoming fouled when the block is lying on the ground with ropes loose.

(d) Pockets and flanges of sheaves used with hoist chains shall be of such dimensions that the chain does not catch or bind during operation.

(e) All running sheaves shall be equipped with means for lubrication. Permanently lubricated, sealed and/or shielded bearings meet this requirement.

(2) Ropes. (a) In using hoisting ropes, the crane manufacturer's recommendation shall be followed. The rated load divided by the number of parts of rope shall not exceed 20 percent of the nominal breaking strength of the rope.

(b) Socketing shall be done in the manner specified by the manufacturer of the assembly.

(c) Rope shall be secured to the drum as follows:

(i) No less than two wraps of rope shall remain on the drum when the hook is in its extreme low position.

(ii) Rope end shall be anchored by a clamp securely attached to the drum, or by a socket arrangement approved by the crane or rope manufacturer.

(d) Rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope. Spacing and number of all types of clips shall be in accordance with (2)(e) of this section. Clips shall be drop-forged steel in all sizes manufactured commercially. When a newly installed rope has been in operation for an hour, all nuts on the clip bolts shall be retightened.

(e) Diameter of Rope	Number of Clips Required	Space Between Clips
1 1/2 inch	8	10 inches
1 3/8 inch	7	9 inches
1 1/4 inch	6	8 inches
1 1/8 inch	5	7 inches
1 inch	5	6 inches
7/8 inch	5	5 1/4 inches
3/4 inch	5	4 1/2 inches
3/8 to 5/8 inch	4	3 inches

(f) Swaged or compressed fittings shall be applied as recommended by the rope or crane manufacturer.

(g) Wherever exposed to temperatures, at which fiber cores would be damaged, rope having an independent wire-rope or wire-strand core, or other temperature-damage resistant core shall be used.

(h) Replacement rope shall be the same size, grade, and construction as the original rope furnished by the crane manufacturer, unless otherwise recommended by a

wire rope manufacturer due to actual working condition requirements.

(3) Equalizers. If a load is supported by more than one part of rope, the tension in the parts shall be equalized.

(4) Hooks. Hooks shall meet the manufacturer's recommendations and shall not be overloaded. [Order 73-5, § 296-24-23515, filed 5/9/73 and Order 73-4, § 296-24-23515, filed 5/7/73.]

WAC 296-24-23517 Warning device. Except for floor operated cranes a gong or other effective warning signal shall be provided for each crane equipped with a powered traveling mechanism. [Order 73-5, § 296-24-23517, filed 5/9/73 and Order 73-4, § 296-24-23517, filed 5/7/73.]

WAC 296-24-23519 Inspection. (1) Inspection Classification. (a) Initial inspection. Prior to initial use all new and altered cranes shall be inspected to insure compliance with the provisions of these standards.

(b) Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

(i) Frequent inspection - Daily to monthly intervals.

(ii) Periodic inspection - 1 to 12 month intervals.

(2) Frequent inspection. The following items shall be inspected for defects at intervals as defined in (1)(b) of this section or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(a) All functional operating mechanisms for maladjustment interfering with proper operation. Daily.

(b) Deterioration or leakage in lines, tanks, valves, drain pumps, and other parts of air or hydraulic systems. Daily.

(c) Hooks with deformation or cracks. Visual inspection daily; monthly inspection with signed reports. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook refer to WAC 296-24-23523(3)(c)(i).

(d) Hoist or load attachment chains, including end connections, for excessive wear, twist, distorted links interfering with proper function, or stretch beyond manufacturer's recommendations. Visual inspection daily; monthly inspection with signed report.

(e) Rope slings, including end connections, for excessive wear, broken wires, stretch, kinking, or twisting. Visual inspection daily; monthly inspection with signed report.

(f) All functional operating mechanisms for excessive wear of components.

(g) Rope reeving for noncompliance with manufacturer's recommendations.

(3) Periodic Inspection. Complete inspections of the crane shall be performed at intervals as generally defined in (1)(b)(ii) of this section, depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of (2) of this section and in addition, the following items. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(a) Deformed, cracked, or corroded members.

(b) Loose bolts or rivets.

(c) Cracked or worn sheaves and drums.

(d) Worn, cracked or distorted parts such as pins, bearings, shafts, gears, rollers, locking and clamping devices.

(e) Excessive wear on brake system parts, linings, pawls, and ratchets.

(f) Load, wind, and other indicators over their full range, for any significant inaccuracies.

(g) Gasoline, diesel, electric, or other powerplants for improper performance or noncompliance with applicable safety requirements.

(h) Excessive wear of chain drive sprockets and excessive chain stretch.

(i) Crane hooks. Magnetic particle or other suitable crack detecting inspection should be performed at least once each year.

(j) Electrical apparatus, for signs of pitting or any deterioration of controller contactors, limit switches and pushbutton stations.

(4) Cranes Not in Regular Use. (a) A crane which has been idle for a period of 1 month or more, but less than 6 months, shall be given an inspection conforming with requirements of (2) of this section and WAC 296-24-23525(2), before placing in service.

(b) A crane which has been idle for a period of over 6 months shall be given a complete inspection conforming with requirements of (2) and (3) of this section and WAC 296-24-23525(2) before placing in service.

(c) Standby cranes shall be inspected at least semi-annually in accordance with requirements of (2) of this section and WAC 296-24-23525(2). Standby cranes exposed to adverse environment should be inspected more frequently. [Order 73-5, § 296-24-23519, filed 5/9/73 and Order 73-4, § 296-24-23519, filed 5/7/73.]

WAC 296-24-23521 Testing. (1) Operational Tests.

(a) Prior to initial use all new and altered cranes shall be tested to insure compliance with this section including the following functions:

(i) Hoisting and lowering.

(ii) Trolley travel.

(iii) Bridge travel.

(iv) Limit switches, locking and safety devices.

(b) The trip setting of hoist limit switches shall be determined by tests with an empty hook traveling in increasing speeds up to the maximum speed. The actuating mechanism of the limit switch shall be located so

that it will trip the switch, under all conditions, in sufficient time to prevent contact of the hook or hook block with any part of the trolley.

(2) **Rated Load Test.** Prior to initial use all new, extensively repaired, and altered cranes should be tested by or under the direction of an appointed or authorized person, confirming the load rating of the crane. The load rating should not be more than 80 percent of the maximum load sustained during the test. Test loads shall not be more than 125 percent of the rated load unless otherwise recommended by the manufacturer. The tests reports shall be placed on file where readily available to appointed personnel. [Order 73-5, § 296-24-23521, filed 5/9/73 and Order 73-4, § 296-24-23521, filed 5/7/73.]

WAC 296-24-23523 Maintenance. (1) **Preventive Maintenance.** A preventive maintenance program based on the crane manufacturer's recommendations shall be established.

(2) **Maintenance Procedure.** (a) Before adjustments and repairs are started on a crane the following precautions shall be taken:

(i) The crane to be repaired shall be run to a location where it will cause the least interference with other cranes and operations in the area.

(ii) All controllers shall be at the off position.

(iii) The main or emergency switch shall be open and locked in the open position.

(iv) Warning or "out of order" signs shall be placed on the crane, also on the floor beneath or on the hook where visible from the floor.

(v) Where other cranes are in operation on the same runway, rail stops or other suitable means shall be provided to prevent interference with the idle crane.

(vi) Where temporary protective rail stops are not available, or practical, a signalman should be placed at a visual vantage point for observing the approach of an active crane and warning its operator when reaching the limit of safe distance from the idle crane.

(b) After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated and maintenance equipment removed.

(3) **Adjustments and Repairs.** (a) Any unsafe conditions disclosed by the inspection requirements of WAC 296-24-23519 shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel.

(b) Adjustments shall be maintained to assure correct functioning of components. The following are examples:

(i) All functional operating mechanisms.

(ii) Limit switches.

(iii) Control systems.

(iv) Brakes.

(v) Power plants.

(c) Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples:

(i) Accessory components, such as hooks, shall be carefully examined periodically and at the time of annual examination and inspection. Cracked or deformed

hooks shall be discarded immediately and not reused on any equipment subject to the provisions of this code.

(ii) Load attachment chains and rope slings showing defects described in WAC 296-24-23519(2)(d) and (e) respectively.

(iii) All critical parts which are cracked, broken, bent, or excessively worn.

(iv) Pendant control stations shall be kept clean and function labels kept legible. [Order 73-5, § 296-24-23523, filed 5/9/73 and Order 73-4, § 296-24-23523, filed 5/7/73.]

WAC 296-24-23525 Rope inspection. (1) **Running Ropes.** A thorough inspection of all ropes shall be made at least once a month and a full written, dated, and signed report of rope condition kept on file where readily available to appointed personnel. Any deterioration, resulting in appreciable loss of original strength, such as described below, shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard:

(a) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(b) A number of broken outside wires and the degree of distribution or concentration of such broken wires.

(c) Worn outside wires.

(d) Corroded or broken wires at end connections.

(e) Corroded, cracked, bent, worn, or improperly applied end connections.

(f) Severe kinking, crushing, cutting, or unstranding.

(2) **Other Ropes.** All rope which has been idle for a period or a month or more due to shutdown or storage of a crane on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by an appointed person whose approval shall be required for further use of the rope. A written and dated report of the rope condition shall be available for inspection. [Order 73-5, § 296-24-23525, filed 5/9/73 and Order 73-4, § 296-24-23525, filed 5/7/73.]

WAC 296-24-23527 Handling the load. (1) **Size of Load.** The crane shall not be loaded beyond its rated load except for test purposes as provided in WAC 296-24-23521.

(2) **Attaching the Load.** (a) The hoist chain or hoist rope shall be free from kinks or twists and shall not be wrapped around the load.

(b) The load shall be attached to the load block hook by means of slings or other approved devices.

(c) Care shall be taken to make certain that the sling clears all obstacles.

(3) **Moving the Load.** (a) The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(c) During hoisting care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) The load does not contact any obstructions.

(d) Cranes shall not be used for side pulls except when specifically authorized by a responsible person who has determined that the stability of the crane is not thereby endangered and that various parts of the crane will not be overstressed.

(e) While any employee is on the load or hook, there shall be no hoisting, lowering, or traveling.

(f) The employer shall require that the operator avoid carrying loads over people.

(g) The operator shall test the brakes each time a load approaching the rated load is handled. The brakes shall be tested by raising the load a few inches and applying the brakes.

(h) The load shall not be lowered below the point where less than two full wraps of rope remain on the hoisting drum.

(i) When two or more cranes are used to lift a load one qualified responsible person shall be in charge of the operation. He shall analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(j) The employer shall assure that the operator does not leave his position at the controls while the load is suspended.

(k) When starting the bridge and when the load or hook approaches near or over personnel, the warning signal shall be sounded.

(4) Hoist Limit Switch. (a) At the beginning of each operator's shift, the upper limit switch of each hoist shall be tried out under no load. Extreme care shall be exercised; the block shall be "inched" into the limit or run in at slow speed. If the switch does not operate properly, the appointed person shall be immediately notified.

(b) The hoist limit switch which controls the upper limit of travel of the load block shall never be used as an operating control. [Order 73-5, § 296-24-23527, filed 5/9/73 and Order 73-4, § 296-24-23527, filed 5/7/73.]

WAC 296-24-23529 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 repairmen or inspectors.

(2) No person should be permitted to operate a crane who cannot speak and read the English language, or who is under eighteen (18) years of age.

(3) No person shall be permitted to operate a crane whose hearing or eye-sight is impaired, or who may be suffering from heart disease or similar ailments.

(4) 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.

(5) The operator shall not eat, smoke or read while actually engaged in the operation of the crane, or operate the crane when he is physically unfit.

(6) The operator or someone especially designated shall properly lubricate all working parts of the crane.

(7) Cranes shall be kept clean.

(8) 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.

(9) If the power goes off, the operator shall immediately throw all controllers to "off" position until the power is again available.

(10) Before closing the main switch the operator shall make sure that all controllers are in "off" position until the power is again available.

(11) The operator shall recognize signals only from the man who is supervising the lift. Operating signals shall follow an established standard. Whistle signals may be used where one crane only is in operation.

(12) 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.

(13) When lowering a load, the operator shall proceed carefully and make sure that he has the load under safe control.

(14) When leaving the cage the operator shall throw all controllers to "off" position and open the main switch.

(15) 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.

(16) Operators shall not permit anyone to ride on the load or hooks, unless using a lifeline or safety device approved by the Department. [Order 73-5, § 296-24-23529, filed 5/9/73 and Order 73-4, § 296-24-23529, filed 5/7/73.]

WAC 296-24-23531 Other requirements—General. (1) Ladders. (a) The employer shall insure that hands are free from encumbrances while personnel are using ladders.

(b) Articles which are too large to be carried in pockets or belts shall be lifted and lowered by hand line.

(2) Cabs. (a) Necessary clothing and personal belongings shall be stored in such a manner as not to interfere with access or operation.

(b) Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

(3) Fire Extinguishers. The employer shall insure that operators are familiar with the operation and care of fire extinguishers provided. [Order 73-5, § 296-24-23531, filed 5/9/73 and Order 73-4, § 296-24-23531, filed 5/7/73.]

WAC 296-24-237 Construction, operation and maintenance—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 (5).

(4) Chain and electric hoists shall be equipped with an approved device which will automatically lock the load when hoisting is stopped.

(5) Electric hoists shall be provided with an approved limit stop to prevent the hoist block from traveling too far in case the operating handle is not released in time. [Order 73-5, § 296-24-237, filed 5/9/73 and Order 73-4, § 296-24-237, filed 5/7/73.]

WAC 296-24-238 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 or other means shall be used to prevent hoists cylinder becoming detached from hanger. [Order 73-5, § 296-24-238, filed 5/9/73 and Order 73-4, § 296-24-238, filed 5/7/73.]

WAC 296-24-240 Crawler locomotive and truck cranes. [Order 73-5, § 296-24-240, filed 5/9/73 and Order 73-4, § 296-24-240, filed 5/7/73.]

WAC 296-24-24001 Definitions. (1) A "crawler crane" consists of a rotating superstructure with power plant, operating machinery, and boom, mounted on a base, equipped with crawler treads for travel. Its function is to hoist and swing loads at various radii.

(2) A "locomotive crane" consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or car equipped for travel on railroad track. It may be self-propelled or propelled by an outside source. Its function is to hoist and swing loads at various radii.

(3) A "truck crane" consists of a rotating superstructure with power plant, operating machinery and boom, mounted on an automotive truck equipped with a power plant for travel. Its function is to hoist and swing loads at various radii.

(4) A "wheel mounted crane" (wagon crane) consists of a rotating superstructure with power plant, operating machinery and boom, mounted on a base or platform equipped with axles and rubber-tired wheels for travel. The base is usually propelled by the engine in the superstructure, but it may be equipped with a separate engine controlled from the superstructure. Its function is to hoist and swing loads at various radii.

(5) An "accessory" is a secondary part or assembly of parts which contributes to the overall function and usefulness of a machine.

(6) "Appointed" means assigned specific responsibilities by the employer or the employer's representative.

(7) "ANSI" means the American National Standards Institute.

(8) An "angle indicator" (boom) is an accessory which measures the angle of the boom to the horizontal.

(9) The "axis of rotation" is the vertical axis around which the crane superstructure rotates.

(10) "Axle" means the shaft or spindle with which or about which a wheel rotates. On truck- and wheel-mounted cranes it refers to an automotive type of axle assembly including housings, gearing, differential, bearings, and mounting appurtenances.

(11) "Axle" (bogie) means two or more automotive-type axles mounted in tandem in a frame so as to divide the load between the axles and permit vertical oscillation of the wheels.

(12) The "base" (mounting) is the traveling base or carrier on which the rotating superstructure is mounted such as a car, truck, crawlers, or wheel platform.

(13) The "boom" (crane) is a member hinged to the front of the rotating superstructure with the outer end supported by ropes leading to a gantry or "A" frame and used for supporting the hoisting tackle.

(14) The "boom angle" is the angle between the longitudinal centerline of the boom and the horizontal. The boom longitudinal centerline is a straight line between the boom foot pin (heel pin) centerline and boom point sheave pin centerline.

(15) The "boom hoist" is a hoist drum and rope reeving system used to raise and lower the boom. The rope system may be all live reeving or a combination of live reeving and pendants.

(16) The "boom stop" is a device used to limit the angle of the boom at the highest position.

(17) A "brake" is a device used for retarding or stopping motion by friction or power means.

(18) A "cab" is housing which covers the rotating superstructure machinery and/or operator's station. On truck crane trucks a separate cab covers the driver's station.

(19) The "clutch" is a friction, electromagnetic, hydraulic, pneumatic, or positive mechanical device for engagement or disengagement of power.

(20) The "counterweight" is a weight used to supplement the weight of the machine in providing stability for lifting working loads.

(21) "Designated" means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

(22) The "drum" is the cylindrical members around which ropes are wound for raising and lowering the load or boom.

(23) "Dynamic" (loading) means loads introduced into the machine or its components by forces in motion.

(24) The "gantry" (A-frame) is a structural frame, extending above the superstructure, to which the boom supports ropes are reeved.

(25) A "jib" is an extension attached to the boom point to provide added boom length for lifting specified loads. The jib may be in line with the boom or offset to various angles.

(26) "Load" (working) means the external load, in pounds, applied to the crane, including the weight of load-attaching equipment such as load blocks, shackles, and slings.

(27) "Load block" (upper) means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended from the boom point.

(28) "Load block" (lower) means the assembly of hook or shackle, swivel, sheaves, pins, and frame suspended by the hoisting ropes.

(29) A "load hoist" is a hoist drum and rope reeving system used for hoisting and lowering loads.

(30) "Load ratings" are crane ratings in pounds established by the manufacturer in accordance with WAC 296-24-24005.

(31) "Outriggers" are extendable or fixed metal arms, attached to the mounting base, which rest on supports at the outer ends.

(32) "Rail clamp" means a tong-like metal device, mounted on a locomotive crane car, which can be connected to the track.

(33) "Reeving" means a rope system in which the rope travels around drums and sheaves.

(34) "Rope" refers to a wire rope unless otherwise specified.

(35) "Side loading" means a load applied at an angle to the vertical plane of the boom.

(36) A "standby crane" is a crane which is not in regular service but which is used occasionally or intermittently as required.

(37) A "standing (guy) rope" is a supporting rope which maintains a constant distance between the points of attachment to the two components connected by the rope.

(38) "Structural competence" means the ability of the machine and its components to withstand the stresses imposed by applied loads.

(39) "Superstructure" means the rotating upper frame structure of the machine and the operating machinery mounted thereon.

(40) "Swing" means the rotation of the superstructure for movement of loads in a horizontal direction about the axis of rotation.

(41) "Swing mechanism" means the machinery involved in providing rotation of the superstructure.

(42) "Tackle" is an assembly of ropes and sheaves arranged for hoisting and pulling.

(43) "Transit" means the moving or transporting of a crane from one jobsite to another.

(44) "Travel" means the functions of the machine moving from one location to another, on a jobsite.

(45) The "travel mechanism" is the machinery involved in providing travel.

(46) "Wheelbase" means the distance between centers of front and rear axles. For a multiple axle assembly the axle center for wheelbase measurement is taken as the midpoint of the assembly.

(47) The "whipline" (auxiliary hoist) is a separate hoist rope system of lighter load capacity and higher speed than provided by the main hoist.

(48) A "winch head" is a power driven spool for handling of loads by means of friction between fiber or wire rope and spool. [Order 73-5, § 296-24-24001, filed 5/9/73 and Order 73-4, § 296-24-24001, filed 5/7/73.]

WAC 296-24-24003 General requirements. (1) Application. This section applies to crawler cranes, locomotive cranes, wheel mounted cranes of both truck and self-propelled wheel type, and any variations thereof which retain the same fundamental characteristics. This section includes only cranes of the above types, which are basically powered by internal combustion engines or electric motors and which utilize drums and ropes. Cranes designed for railway and automobile wreck clearances are excepted. The requirements of these standards are applicable only to machines when used as lifting cranes.

(2) New and Existing Equipment. All new crawler, locomotive, and truck cranes constructed and utilized on or after the effective date of these standards, shall meet the design specifications of the American National Standard Safety Code for Crawler, Locomotive, and Truck Cranes, ANSI B 30.5-1968. Crawler, locomotive, and truck cranes constructed prior to the effective date of these standards should be modified to conform to those design specifications by December 31, 1973, unless it can be shown that the crane cannot feasibly or economically be altered and that the crane substantially complies with the requirements of this section. Replacement parts shall be of equal or better quality than the original equipment and suitable for the purpose. Repairs or modifications shall be such as to render the equipment equal to or better than the original construction or design.

(3) Designated Personnel. Only designated personnel shall be permitted to operate a crane covered by this section. [Order 74-27, § 296-24-24003, filed 5/7/74; Order 73-5, § 296-24-24003, filed 5/9/73 and Order 73-4, § 296-24-24003, filed 5/7/73.]

WAC 296-24-24005 Load ratings. (1) Load Ratings—Where Stability Governs Lifting Performance. (a) The margin of stability for determination of load ratings, with booms of stipulated lengths at stipulated working radii for the various types of crane mountings is established by taking a percentage of the loads which will produce a condition of tipping or balance with the boom in the least stable direction, relative to the mounting. The load ratings shall not exceed the following percentages for cranes, with the indicated types of mounting under conditions stipulated in (1)(b) and (c) of this section.

Type of crane mounting:	Maximum load ratings (percent of tipping loads)
Locomotive, without outriggers;	
Booms 60 feet or less	85
Booms over 60 feet	85 ¹
Locomotive, using outriggers fully extended . .	80
Crawler, without outriggers	75
Crawler, using outriggers fully extended	85

Type of crane mounting:	Maximum load ratings (percent of tipping loads)
Truck and wheel mounted without outriggers or using outriggers fully extended	85

¹Unless this results in less than 30,000 pound-foot net stabilizing moment about the rail, which shall be minimum with such booms.

(b) The following stipulation shall govern the application of the values in (1)(a) of this section for locomotive cranes:

(i) Tipping with or without the use of outriggers occurs when half of the wheels farthest from the load leave the rail.

(ii) The crane shall be standing on track which is level within 1 percent grade.

(iii) Radius of the load is the horizontal distance from a projection of the axis of rotation to the rail support surface, before loading, to the center of vertical hoist line or tackle with load applied.

(iv) Tipping loads from which ratings are determined shall be applied under static conditions only, i.e., without dynamic effect of hoisting, lowering, or swinging.

(v) The weight of all auxiliary handling devices such as hoist blocks, hooks, and slings shall be considered a part of the load rating.

(c) Stipulations governing the application of the values in (i)(a) of this section for crawler, truck, and wheel-mounted cranes shall be in accordance with Crane Load-Stability Test Code. Society of Automotive Engineers (SAE) J765.

NOTE: The effectiveness of these preceding stability factors will be influenced by such additional factors as freely suspended loads, track, wind, or ground conditions, condition and inflation of rubber tires, boom lengths, proper operating speeds for existing conditions, and, in general, careful and competent operation. All of these shall be taken into account by the user.

(2) 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.

(3) Inspection Classification. (a) Initial Inspection. Prior to initial use all new and altered cranes shall be inspected to insure compliance with provisions of these standards. [Order 73-5, § 296-24-24005, filed 5/9/73 and Order 73-4, § 296-24-24005, filed 5/7/73.]

WAC 296-24-24007 Inspection classification. (1) Regular Inspection. Inspection procedure for cranes in regular service is divided into two general classifications based upon the intervals at which inspection should be

performed. The intervals in turn are dependent upon the nature of the critical components of the crane and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as "frequent" and "periodic" with respective intervals between inspections as defined below:

(a) Frequent inspection: Daily to monthly intervals.

(b) Periodic inspection: One- to 12-month intervals, or as specifically recommended by the manufacturer.

(2) Frequent Inspection. Items such as the following shall be inspected for defects at intervals as defined in (2)(a) of this section or as specifically indicated including observation during operation for any defects which might appear between regular inspection. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(a) All control mechanisms for maladjustment interfering with proper operation: Daily.

(b) All control mechanisms for excessive wear of components and contamination by lubricants or other foreign matter.

(c) All safety devices for malfunction.

(d) Deterioration or leakage in air or hydraulic systems: Daily.

(e) Crane hooks with deformations or cracks. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook.

(f) Rope reeving for noncompliance with manufacturer's recommendations.

(g) Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.

(3) Periodic Inspection. Complete inspections of the crane shall be performed at intervals as generally defined in (2)(b) of this section depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of (3) of this section and in addition, items such as the following. Any deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:

(a) Deformed, cracked, or corroded members, in the crane structure and boom.

(b) Loose bolts or rivets.

(c) Cracked or worn sheaves and drums.

(d) Worn, cracked, or distorted parts such as pins, bearings, shafts, gears, rollers and locking devices.

(e) Excessive wear on brake and clutch system parts, linings, pawls, and ratchets.

(f) Load, boom angle, and other indicators over their full range, for any significant inaccuracies.

(g) Gasoline, diesel, electric, or other power plants for improper performance or noncompliance with safety requirements.

(h) Excessive wear of chain-drive sprockets and excessive chain stretch.

(i) Travel steering, braking, and locking devices, for malfunction.

(j) Excessively worn or damaged tires.

(4) Cranes not in Regular Use. (a) A crane which has been idle for a period of one month or more, but less

than 6 months, shall be given an inspection conforming with requirements of (3) of this section and WAC 296-24-24013(2)(b) before placing in service.

(b) A crane which has been idle for a period of six months shall be given a complete inspection conforming with requirements of (3) and (4) of this section and WAC 296-24-24013(2)(b) before placing in service.

(c) Standby cranes shall be inspected at least semi-annually in accordance with requirements of (3) of this section and WAC 296-24-24013(2)(b). Such cranes which are exposed to adverse environment should be inspected more frequently.

(5) Inspection Records. Written, dated, and signed inspection reports and records shall be made monthly on critical items in use such as brakes, crane hooks, and ropes. Records shall be kept readily available. [Order 73-5, § 296-24-24007, filed 5/9/73 and Order 73-4, § 296-24-24007, filed 5/7/73.]

WAC 296-24-24009 Testing. (1) Operational Tests.

(a) In addition to prototype tests and quality-control measures, the user of each new production crane shall require that it be tested and related data supplied by the manufacturer to the extent necessary to assure compliance with the operational requirements of this paragraph including functions such as the following:

- (i) Load hoisting and lowering mechanisms
- (ii) Boom hoisting and lower mechanisms
- (iii) Swinging mechanism
- (iv) Travel mechanism
- (v) Safety devices

(b) Where the complete production crane is not supplied by one manufacturer such tests shall be conducted at final assembly.

(c) Certified production-crane test results shall be made available.

(2) Rated Load Test. (a) Written reports shall be available showing test procedures and confirming the adequacy of repairs or alterations.

(b) Test loads shall not exceed 110 percent of the rated load at any selected working radius.

(c) Where rerating is necessary:

(i) Crawler, truck, and wheel-mounted cranes shall be tested in accordance with SAE Recommended Practice, Crane Load Stability Test Code J765 (April 1961).

(ii) Locomotive cranes shall be tested in accordance with WAC 296-24-24005(1)(a) and (b).

(iii) Rerating test report shall be readily available.

(d) No cranes shall be rerated in excess of the original load ratings unless such rating changes are approved by the crane manufacturer or final assembler. [Order 73-5, § 296-24-24009, filed 5/9/73 and Order 73-4, § 296-24-24009, filed 5/7/73.]

WAC 296-24-24011 Maintenance procedure. (1)

Any unsafe conditions disclosed by the inspection requirements of this section shall be corrected before operation of the crane is resumed. Adjustments and repairs shall be done only by designated personnel.

(2) After adjustments and repairs have been made the crane shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance

equipment removed. [Order 73-5, § 296-24-24011, filed 5/9/73 and Order 73-4, § 296-24-24011, filed 5/7/73.]

WAC 296-24-24013 Rope inspection. (1) Running Ropes. A thorough inspection of all ropes in use shall be made at least once a month and a full written, dated, and signed report of rope condition kept on file where readily available. All inspections shall be performed by an appointed or authorized person. Any deterioration, resulting in appreciable loss of original strength, such as described below, shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard:

(a) Reduction of rope diameter below nominal diameter due to loss of core support, internal, or external corrosion or wear of outside wires.

(b) A number of broken outside wires and the degree of distribution of concentration of such broken wires.

(c) Worn outside wires.

(d) Corroded or broken wires at end connections.

(e) Corroded, cracked, bent, worn, or improperly applied end connections.

(f) Severe kinking, crushing, cutting, or unstranding.

(2) Other Ropes. (a) Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to inspect ropes at these locations.

(b) All rope which has been idle for a period of a month or more due to shut down or storage of a crane on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration and shall be performed by an appointed or authorized person whose approval shall be required for further use of the rope. A written and dated report of the rope condition shall be available.

(c) Particular care shall be taken in the inspection of nonrotating rope. [Order 73-5, § 296-24-24013, filed 5/9/73 and Order 73-4, § 296-24-24013, filed 5/7/73.]

WAC 296-24-24015 Handling the load. (1) Size of Load. (a) No crane shall be loaded beyond the rated load, except for test purposes as provided in WAC 296-24-24009.

(b) When loads which are limited by structural competence rather than by stability are to be handled, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

(2) Attaching the Load. (a) The hoist rope shall not be wrapped around the load.

(b) The load shall be attached to the hook by means of slings or other approved devices.

(3) Moving the Load. (a) The employer shall assure that:

(i) The crane is level and where necessary blocked properly.

(ii) The load is well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist, the following conditions shall be noted:

- (i) Hoist rope shall not be kinked.
- (ii) Multiple part lines shall not be twisted around around each other.
- (iii) The hook shall be brought over the load in such a manner as to prevent swinging.
- (iv) If there is a slack rope condition, it should be determined that the rope is properly seated on the drum and in the sheaves.

(c) During hoisting care shall be taken that:

- (i) There is no sudden acceleration or deceleration of the moving load.
- (ii) The load does not contact any obstructions.
- (d) Side loading of booms shall be limited to freely suspended loads. Cranes shall not be used for dragging loads sideways.

(e) No hoisting, lowering, swinging, or traveling shall be done while anyone is on the load or hook.

(f) The operator should avoid carrying loads over people.

(g) On truck mounted cranes, no loads shall be lifted over the front area except as approved by the crane manufacturer.

(h) The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

(i) Outriggers shall be used when the load to be handled at that particular radius exceeds the rated load without outriggers as given by the manufacturer for that crane. Where floats are used they shall be securely attached to the outriggers. Wood blocks used to support outriggers shall:

- (i) Be strong enough to prevent crushing.
- (ii) Be free from defects.
- (iii) Be of sufficient width and length to prevent shifting or toppling under load.

(j) Neither the load nor the boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.

(k) Before lifting loads with locomotive cranes without using outriggers, means shall be applied to prevent the load from being carried by the truck springs.

(l) When two or more cranes are used to lift one load, one designated person shall be responsible for the operation. He shall be required to analyze the operation and instruct all personnel involved in the proper positioning, rigging of the load, and the movements to be made.

(m) In transit the following additional precautions shall be exercised.

- (i) The boom shall be carried in line with the direction of motion.
- (ii) The superstructure shall be secured against rotation, except when negotiating turns when there is an operator in the cab or the boom is supported on a dolly.
- (iii) The empty hook shall be lashed or otherwise restrained so that it cannot swing freely.

(n) Before traveling a crane with load, a designated person shall be responsible for determining and controlling safety. Decisions such as position of load, boom location, ground support, travel route, and speed of movement shall be in accord with his determinations.

(o) A crane with or without load shall not be traveled with the boom so high that it may bounce back over the cab.

(p) When rotating the crane, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radii at which it can be controlled. A tag or restraint line shall be used when rotation of the load is hazardous.

(q) When a crane is to be operated at a fixed radius, the boom-hoist pawl or other positive locking device shall be engaged.

(r) Ropes shall not be handled on a winch head without the knowledge of the operator.

(s) While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

(4) Holding the Load. (a) The operator shall not be permitted to leave his position at the controls while the load is suspended.

(b) No person should be permitted to stand or pass under a load on the hook.

(c) If the load must remain suspended for any considerable length of time, the operator shall hold the drum from rotating in the lowering direction by activating the positive controllable means of the operator's station. [Order 73-5, § 296-24-24015, filed 5/9/73 and Order 73-4, § 296-24-24015, filed 5/7/73.]

WAC 296-24-24017 Other requirements. (1) Rail Clamps. Rail clamps shall not be used as a means of restraining tipping of a locomotive crane.

(2) Ballast or Counterweight. Cranes shall not be operated without the full amount of any ballast or counterweight in place as specified by the maker, but truck cranes that have dropped the ballast or counterweight may be operated temporarily with special care and only for light loads without full ballast or counterweight in place. The ballast or counterweight in place specified by the manufacturer shall not be exceeded.

(3) Cabs. (a) Necessary clothing and personal belongings shall be stored in such a manner as to not interfere with access or operation.

(b) Tools, oil cans, waste, extra fuses, and other necessary articles shall be stored in the tool box, and shall not be permitted to lie loose in or about the cab.

(4) Refueling. (a) Refueling with small portable containers shall be done with Underwriter's Laboratories or Factory Mutual Laboratories approved, or equivalent, safety type can equipped with an automatic closing cap and flame arrester.

(b) Machines shall not be refueled with the engine running.

(5) Fire Extinguishers. (a) A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the cab or vicinity of the crane.

(b) Operating and maintenance personnel shall be made familiar with the use and care of the fire extinguishers provided.

(6) Swinging Locomotive Cranes. A locomotive crane shall not be swung into a position where railway cars on an adjacent track might strike it, until it has been ascertained that cars are not being moved on the adjacent

track and proper flag protection has been established. [Order 73-5, § 296-24-24017, filed 5/9/73 and Order 73-4, § 296-24-24017, filed 5/7/73.]

WAC 296-24-24019 Operating near electric power lines. (1) Clearances. Except where the 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 crane have been erected to prevent physical contact with the lines, cranes shall be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

(a) For lines rated 50 kv. or below, minimum clearance between the lines and any part of the crane or load shall be 10 feet.

(b) 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.

(c) In transit with no load and boom lowered the clearance shall be a minimum of 4 feet.

(2) Boom Guards. Cage-type boom guards, insulating links, or proximity warning devices may be used on cranes, but the use of such devices shall not operate to alter the requirements of (1) of this section.

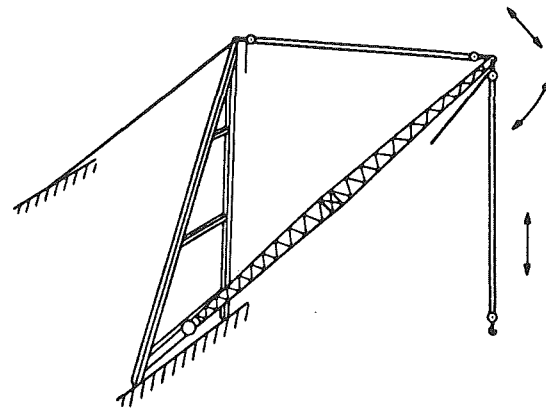
(3) Notification. Before the commencement of operations near electrical lines, the owners of the lines or their authorized representative shall be notified and provided with all pertinent information. The cooperation of the owner shall be requested.

(4) Overhead Wires. 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. [Order 73-5, § 296-24-24019, filed 5/9/73 and Order 73-4, § 296-24-24019, filed 5/7/73.]

WAC 296-24-245 Derricks. [Order 73-5, § 296-24-245, filed 5/9/73 and Order 73-4, § 296-24-245, filed 5/7/73.]

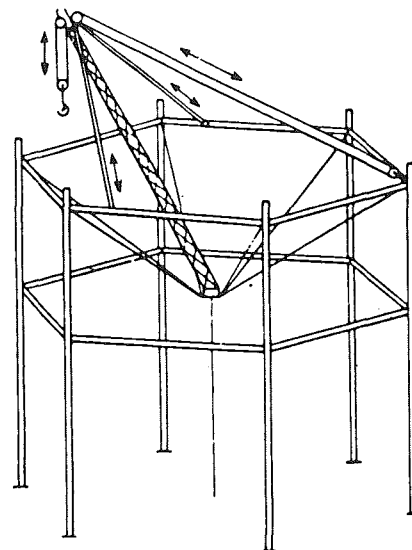
WAC 296-24-24501 Definitions. (1) A "derrick" is an apparatus consisting of a mast or equivalent member held at the head by guys or braces, with or without a boom, for use with a hoisting mechanism and operating ropes.

(2) "A-frame derrick" means a derrick in which the boom is hinged from a cross member between the bottom ends of two upright members spread apart at the lower ends and joined at the top; the boom point secured to the junction of the side members, and the side members are braced or guyed from this junction point.



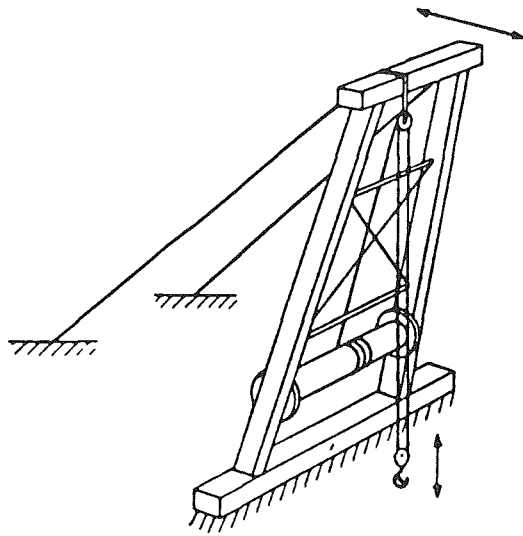
A-FRAME

(3) A "basket derrick" is a derrick without a boom, similar to a gin pole with its base supported by ropes attached to corner posts or other parts of the structure. The base is at a lower elevation than its supports. The location of the base of a basket derrick can be changed by varying the length of the rope supports. The top of the pole is secured with multiple reeved guys to position the top of the pole to the desired location by varying the length of the upper guy lines. The load is raised and lowered by ropes through a sheave or block secured to the top of the pole.



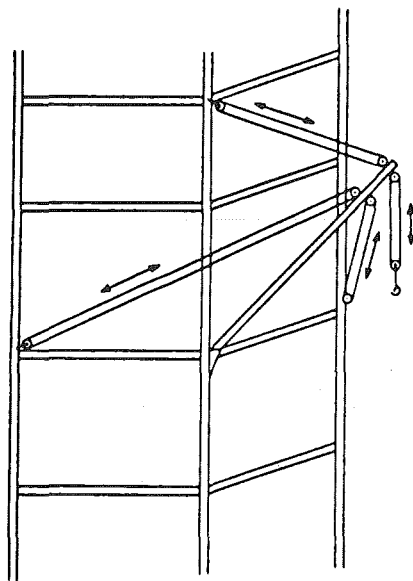
BASKET

(4) "Breast derrick" means a derrick without boom. The mast consists of two side members spread farther apart at the base than at the top and tied together at top and bottom by rigid members. The mast is prevented from tipping forward by guys connected to its top. The load is raised and lowered by ropes through a sheave or block secured to the top crosspiece.



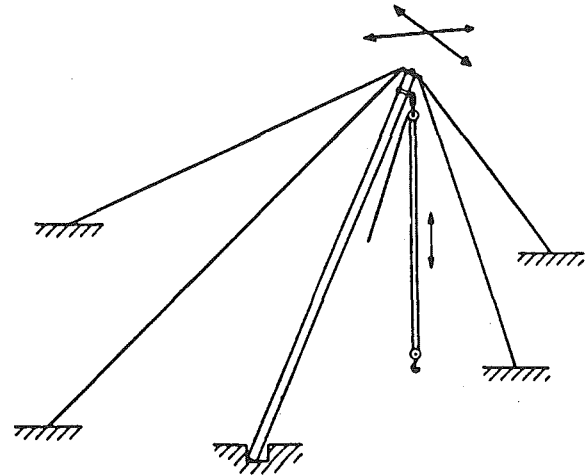
BREAST

(5) "Chicago boom derrick" means a boom which is attached to a structure, and outside upright member of the structure serving as the mast, and the boom being stepped in a fixed socket clamped to the upright. The derrick is complete with load, boom, and boom point swing line falls.



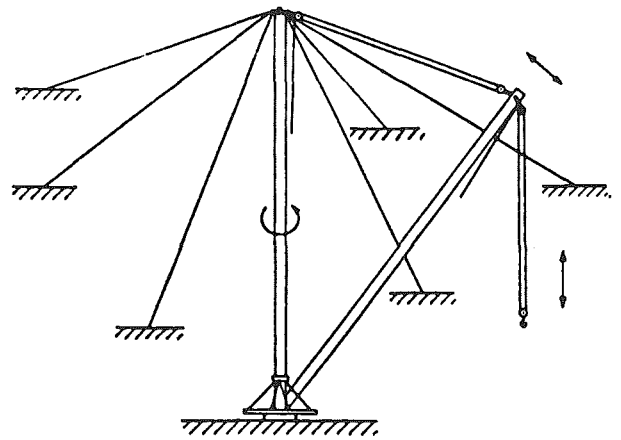
CHICAGO BOOM

(6) A "gin pole derrick" is a derrick without a boom. Its guys are so arranged from its top as to permit leaning the mast in any direction. The load is raised and lowered by ropes reeved through sheaves or blocks at the top of the mast.



GIN POLE

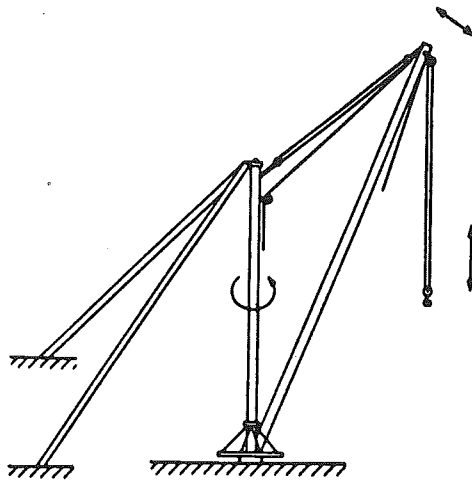
(7) "Guy derrick" means a fixed derrick consisting of a mast capable of being rotated, supported in a vertical position by guys, and a boom whose bottom end is hinged or pivoted to move in a vertical plane with a reeved rope between the head of the mast and the boom point for raising and lowering the boom, and a reeved rope from the boom point for raising and lowering the load.



GUY

(8) "Shearleg derrick" means a derrick without a boom and similar to a breast derrick. The mast, wide at the bottom and narrow at the top, is hinged at the bottom and has its top secured by a multiple reeved guy to permit handling loads at various radii by means of load tackle suspended from the mast top.

(9) A "stiffleg derrick" is a derrick similar to a guy derrick except that the mast is supported or held in place by two or more stiff members, called stifflegs, which are capable of resisting either tensile or compressive forces. Sills are generally provided to connect the lower ends of the stifflegs to the foot of the mast.



STIFF LEG

(10) "Appointed" means assigned specific responsibilities by the employer or the employer's representative.

(11) "ANSI" means the American National Standards Institute.

(12) A boom is a timber or metal section or strut, pivoted or hinged at the heel (lower end) at a location fixed in height on a frame or mast or vertical member, and with its point (upper end) supported by chains, ropes, or rods to the upper end of the frame mast, or vertical member. A rope for raising and lowering the load is reeved through sheaves or a block at the boom point. The length of the boom shall be taken as the straight line distance between the axis of the foot pin and the axis of the boom point sheave pin, or where used, the axis of the upper load block attachment pin.

(13) "Boom harness" means the block and sheave arrangement on the boom point to which the topping lift cable is reeved for lowering and raising the boom.

(14) The "boom point" is the outward end of the top section of the boom.

(15) "Derrick bullwheel" means a horizontal ring or wheel, fastened to the foot of a derrick, for the purpose of turning the derrick by means of ropes leading from this wheel to a powered drum.

(16) "Designated" means selected or assigned by the employer or employer's representative as being qualified to perform specific duties.

(17) "Eye" means a loop formed at the end of a rope by securing the dead end to the live end at the base of the loop.

(18) A "fiddle block" is a block consisting of two sheaves in the same plane held in place by the same cheek plates.

(19) The "foot bearing" or "foot block" (sill block) is the lower support on which the mast rotates.

(20) A "gudgeon pin" is a pin connecting the mast cap to the mast allowing rotation of the mast.

(21) A "guy" is a rope used to steady or secure the mast or other member in the desired position.

(22) "Load, working" means the external load, in pounds, applied to the derrick, including the weight of

load attaching equipment such as load blocks, shackles, and slings.

(23) "Load block, lower" means the assembly of sheaves, pins, and frame suspended by the hoisting rope.

(24) "Load block, upper" means the assembly of sheaves, pins, and frame suspended from the boom.

(25) "Mast" means the upright member of the derrick.

(26) "Mast cap (spider)" means the fitting at the top of the mast to which the guys are connected.

(27) "Reeving" means a rope system in which the rope travels around drums and sheaves.

(28) "Rope" refers to wire rope unless otherwise specified.

(29) "Safety Hook" means a hook with a latch to prevent slings or load from accidentally slipping off the hook.

(30) "Side loading" is a load applied at an angle to the vertical plane of the boom.

(31) The "sill" is a member connecting the foot block and stiffleg or a member connecting the lower ends of a double member mast.

(32) A "standby derrick" is a derrick not in regular service which is used occasionally or intermittently as required.

(33) "Stiff leg" means a rigid member supporting the mast at the head.

(34) "Swing" means rotation of the mast and/or boom for movements of loads in a horizontal direction about the axis of rotation. [Order 73-5, § 296-24-24501, filed 5/9/73 and Order 73-4, § 296-24-24501, filed 5/7/73.]

WAC 296-24-24503 General requirements. (1) Application. This section applies to guy, stiffleg, basket, breast, gin pole, Chicago Boom and A-frame derricks of the stationary type, capable of handling loads at variable reaches and powered by hoists through systems of rope reeving, used to perform lifting hook work, single or multiple line bucket work, grab, grapple, and magnet work. Derricks may be permanently installed for temporary use as in construction work. The requirements of this section also apply to any modification of these types which retain their fundamental features, except for floating derricks.

(2) New and existing equipment. All new derricks constructed and installed on or after the effective date of these standards shall meet the design specifications of the "American National Standard Safety Code for Derricks, ANSI B30.6-1969". Derricks constructed prior to the effective date of these standards should be modified to conform to these design specifications by December 31, 1973 unless it can be shown that the derrick cannot feasibly or economically be altered and that the derrick substantially complies with the requirements of this section.

(a) Operating controls shall be marked or an explanation of the controls shall be posted in full view of the operator.

(b) Cranes or derricks having a movable working boom shall have a radius or boom angle indicator installed. This shall be located where the operator can readily read it while in his normal operating position.

(c) Top of boom painted. The top six feet of the boom or jib shall be painted bright yellow.

(3) Designated Personnel. Only designated personnel shall be permitted to operate a derrick covered by this section. [Order 76-6, § 296-24-24503, filed 3/1/76; Order 73-5, § 296-24-24503, filed 5/9/73 and Order 73-4, § 296-24-24503, filed 5/7/73.]

WAC 296-24-24505 Load ratings. (1) Rated Load Marking. For permanently installed derricks with fixed lengths of boom, guy, and mast, a substantial, durable, and clearly legible rating chart shall be provided with each derrick and securely affixed where it is visible to personnel responsible for the safe operation of the equipment. The chart shall include the following data:

(a) Manufacturer's approved load ratings at corresponding ranges of boom angle or operating radii.

(b) Specific lengths of components on which the load ratings are based.

(c) Required parts for hoist reeving. Size and construction of rope may be shown either on the rating chart or in the operating manual

(2) Nonpermanent Installations. For nonpermanent installations, the employer shall provide sufficient information from which capacity charts can be prepared for the particular installation. The capacity charts shall be located at the derricks or the jobsite office. [Order 73-5, § 296-24-24505, filed 5/9/73 and Order 73-4, § 296-24-24505, filed 5/7/73.]

WAC 296-24-24507 Inspection. (1) Inspection Classification. (a) Prior to initial use all new and altered derricks shall be inspected to insure compliance with the provisions of these standards.

(b) Inspection procedure for derricks in regular service is divided into two general classifications based upon the intervals at which inspection should be performed. The intervals in turn are dependent upon the nature of the critical components of the derrick and the degree of their exposure to wear, deterioration, or malfunction. The two general classifications are herein designated as frequent and periodic with respective intervals between inspections as defined below:

(i) Frequent inspection - Daily to monthly intervals.

(ii) Periodic inspection - 1- to 12-month intervals, or as specified by the manufacturer.

(2) Frequent Inspection. Items such as the following shall be inspected for defects at intervals as defined in (1)(b)(i) of this section or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. Deficiencies shall be carefully examined for any safety hazard.

(a) All control mechanisms: Inspect daily for adjustment, wear, and lubrication.

(b) All chords and lacing: Inspect daily, visually.

(c) Tension in guys: Daily.

(d) Plumb of the mast.

(e) Deterioration or leakage in air or hydraulic systems: Daily.

(f) Derrick hooks for deformations or cracks; for hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook, refer to WAC 296-24-24511(3)(c).

(g) Rope reeving; visual inspection for noncompliance with derrick manufacturer's recommendations.

(h) Hoist brakes, clutches, and operating levers: check daily for proper functioning before beginning operations.

(i) Electrical apparatus for malfunctioning, signs of excessive deterioration, dirt, and moisture accumulation.

(3) Periodic Inspection. (a) Complete inspections of the derrick shall be performed at intervals as generally defined in (1)(b)(ii) of this section depending upon its activity, severity of service, and environment, or as specifically indicated below. These inspections shall include the requirements of (2) of this section and in addition, items such as the following. Deficiencies shall be carefully examined and a determination made as to whether they constitute a safety hazard:

(i) Structural members for deformations, cracks, and corrosion.

(ii) Bolts or rivets for tightness.

(iii) Parts such as pins, bearings, shafts, gears, sheaves, drums, rollers, locking and clamping devices, for wear, cracks, and distortion.

(iv) Gudgeon pin for cracks, wear, and distortion each time the derrick is to be erected.

(v) Power plants for proper performance and compliance with applicable safety requirements.

(vi) Hooks: magnetic particle or other suitable crack detecting inspection should be performed at least once each year.

(b) Foundation or supports shall be inspected for continued ability to sustain the imposed loads.

(4) Derricks not in Regular Use. (a) A derrick which has been idle for a period of 1 month or more, but less than 6 months, shall be given an inspection conforming with requirements of (2) of this section and WAC 296-24-24513(2) before placing in service.

(b) A derrick which has been idle for a period of over 6 months shall be given a complete inspection conforming with requirements of (2) and (3) of this section and WAC 296-24-24513(3) before placing in service.

(c) Standby derricks shall be inspected at least semi-annually in accordance with requirements of (2) of this section and WAC 296-24-24513(3). Those exposed to adverse environment should be inspected more frequently. [Order 73-5, § 296-24-24507, filed 5/9/73 and Order 73-4, § 296-24-24507, filed 5/7/73.]

WAC 296-24-24509 Testing. (1) Operational Tests. Prior to initial use all new and altered derricks shall be tested to ensure compliance with this section including the following functions:

(a) Load hoisting and lowering.

(b) Boom up and down.

(c) Swing.

(d) Operation of clutches and brakes of hoist.

(2) Anchorages. All anchorages shall be approved by the appointed person. Rock and hairpin anchorages may require special testing. [Order 73-5, § 296-24-24509, filed 5/9/73 and Order 73-4, § 296-24-24509, filed 5/7/73.]

WAC 296-24-24511 Maintenance. (1) Preventive Maintenance. A preventive maintenance program based on the derrick manufacturer's recommendations shall be established.

(2) Maintenance Procedure. (a) Before adjustments and repairs are started on a derrick the following precautions shall be taken:

(i) The derrick to be repaired shall be arranged so it will cause the least interference with other equipment and operations in the area.

(ii) All hoist drum dogs shall be engaged.

(iii) The main or emergency switch shall be locked in the open position, if an electric hoist is used.

(iv) Warning or out of order signs shall be placed on the derrick and hoist.

(v) The repairs of booms or derricks shall either be made when the booms are lowered and adequately supported or safely tied off.

(vi) A good communication system shall be set up between the hoist operator and the appointed individual in charge of the derrick operations before any work on the equipment is started.

(vii) Welding repairs shall be approved by an appointed person.

(b) After adjustments and repairs have been made the derrick shall not be operated until all guards have been reinstalled, safety devices reactivated, and maintenance equipment removed.

(3) Adjustments and Repairs. (a) Any unsafe conditions disclosed by inspection shall be corrected before operation of the derrick is resumed.

(b) Adjustments shall be maintained to assure correct functioning of components.

(c) Repairs or replacements shall be provided promptly as needed for safe operation. The following are examples of conditions requiring prompt repair or replacement:

(i) Hooks showing defects described in WAC 296-24-24507(2)(f) shall be discarded.

(ii) All critical parts which are cracked, broken, bent, or excessively worn.

(iii) Pitted or burned electrical contacts should be corrected only by replacement and in sets. Controller parts should be lubricated as recommended by the manufacturer.

(iv) All replacement and repaired parts shall have at least the original safety factor. [Order 73-5, § 296-24-24511, filed 5/9/73 and Order 73-4, § 296-24-24511, filed 5/7/73.]

WAC 296-24-24513 Rope inspection. (1) Running Ropes. A thorough inspection of all ropes in use shall be made at least once a month and a full written, dated, and signed report of rope condition kept on file where readily available. Any deterioration, resulting in appreciable loss of original strength, such as described below,

shall be carefully noted and determination made as to whether further use of the rope would constitute a safety hazard:

(a) Reduction of rope diameter below nominal diameter due to loss of core support, internal or external corrosion, or wear of outside wires.

(b) A number of broken outside wires and the degree of distribution or concentration of such broken wires.

(c) Worn outside wires.

(d) Corroded or broken wires at end connections.

(e) Corroded, cracked, bent, worn, or improperly applied end connections.

(f) Severe kinking, crushing, cutting, or unstranding.

(2) Idle Ropes. All rope which has been idle for a period of a month or more due to shutdown or storage of derrick on which it is installed shall be given a thorough inspection before it is placed in service. This inspection shall be for all types of deterioration. A written and dated report of the rope condition shall be available.

(3) Nonrotating Ropes. Particular care shall be taken in the inspection of nonrotating rope.

NOTE: Limited Travel Ropes. Heavy wear and/or broken wires may occur in sections in contact with equalizer sheaves or other sheaves where rope travel is limited, or with saddles. Particular care shall be taken to inspect ropes at these locations.

[Order 73-5, § 296-24-24513, filed 5/9/73 and Order 73-4, § 296-24-24513, filed 5/7/73.]

WAC 296-24-24515 Operations of derricks. Derrick operation shall be directed only by the individual specifically designated for that purpose. [Order 73-5, § 296-24-24515, filed 5/9/73 and Order 73-4, § 296-24-24515, filed 5/7/73.]

WAC 296-24-24517 Handling the load. (1) Size of Load. (a) No derrick shall be loaded beyond the rated load.

(b) When loads approach the maximum rating of the derrick, it shall be ascertained that the weight of the load has been determined within plus or minus 10 percent before it is lifted.

(2) Attaching the Load. (a) The hoist rope shall not be wrapped around the load.

(b) The load shall be attached to the hook by means of slings or other suitable devices.

(3) Moving the Load. (a) The load shall be well secured and properly balanced in the sling or lifting device before it is lifted more than a few inches.

(b) Before starting to hoist, the following conditions shall be noted:

(i) Hoist rope shall not be kinked.

(ii) Multiple part lines shall not be twisted around each other.

(iii) The hook shall be brought over the load in such a manner as to prevent swinging.

(iv) If there is a slack rope condition, it should be determined that the rope is properly seated on the drum and in the sheaves.

(c) During hoisting, care shall be taken that:

(i) There is no sudden acceleration or deceleration of the moving load.

(ii) Load does not contact any obstructions.

(d) A derrick shall not be used for side loading except when specifically authorized by a responsible person who has determined that the various structural components will not be overstressed.

(e) No hoisting, lowering, or swinging shall be done while anyone is on the load or hook.

(f) The operator shall avoid carrying loads over people.

(g) The operator shall test the brakes each time a load approaching the rated load is handled by raising it a few inches and applying the brakes.

(h) Neither the load nor boom shall be lowered below the point where less than two full wraps of rope remain on their respective drums.

(i) When rotating a derrick, sudden starts and stops shall be avoided. Rotational speed shall be such that the load does not swing out beyond the radius at which it can be controlled.

(j) Boom and hoisting rope systems shall not be twisted.

(4) Holding the Load. (a) The operator shall not be allowed to leave his position at the controls while the load is suspended.

(b) People should not be permitted to stand or pass under a load on the hook.

(c) If the load must remain suspended for any considerable length of time, a dog, or pawl and ratchet, or other equivalent means, rather than the brake alone, shall be used to hold the load.

(5) Use of Winch Heads. (a) Ropes shall not be handled on a winch head without the knowledge of the operator.

(b) While a winch head is being used, the operator shall be within convenient reach of the power unit control lever.

(6) Securing Boom. Dogs, pawls, or other positive holding mechanism on the hoist shall be engaged. When not in use, the derrick boom shall:

(a) Be laid down;

(b) Be secured to a stationary member, as nearly under the head as possible, by attachment of a sling to the load block; or

(c) Be hoisted to a vertical position and secured to the mast. [Order 73-5, § 296-24-24517, filed 5/9/73 and Order 73-4, § 296-24-24517, filed 5/7/73.]

WAC 296-24-24519 Other requirements. (1)

Guards. (a) Exposed moving parts, such as gears, ropes, setscrews, projecting keys, chains, chain sprockets, and reciprocating components, which constitute a hazard under normal operating conditions shall be guarded.

(b) Guards shall be securely fastened.

(c) Each guard shall be capable of supporting without permanent distortion, the weight of a 200-pound person unless the guard is located where it is impossible for a person to step on it.

(2) Hooks. (a) Hooks shall meet the manufacturer's recommendations and shall not be overloaded.

(b) Safety latch type hooks shall be used wherever possible.

(3) Fire Extinguishers. (a) A carbon dioxide, dry chemical, or equivalent fire extinguisher shall be kept in the immediate vicinity of the derrick.

(b) Operating and maintenance personnel shall be familiar with the use and care of the fire extinguishers provided.

(4) Refueling. (a) Refueling with portable containers shall be done with Underwriters' Laboratory, Inc. (UL), or Factory Mutual Laboratories approved, or equivalent, safety type containers equipped with automatic closing spout and flame arrester.

(b) Machines shall not be refueled with the engine running.

(5) Operating Near Electric Powerlines. (a) Except where the electrical distribution and transmission lines have been deenergized and visibility grounded at point of work or where insulating barriers not a part of or an attachment to the derrick have been erected to prevent physical contact with the lines, derricks shall be operated proximate to, under, over, by, or near powerlines only in accordance with the following:

(i) For lines rated 50 kv. or below minimum clearance between the lines and any part of the derrick or load shall be 10 feet.

(ii) For lines rated over 50 kv. minimum clearance between lines and any part of the derrick or load shall be 10 feet plus 0.4 inch for each 1 kv. over 50 kv., or use twice the length of the line insulator, but never less than 10 feet.

(b) Cage-type boom guards, insulating links, or proximity warning devices may be used on derricks, but the use of such devices shall not operate to alter the requirements of (5)(a) of this section.

(c) Before the commencement of operations near electrical lines, the owners of the lines or their authorized representatives shall be notified and provided with pertinent information. The owner's cooperation shall be requested.

(d) Any overhead wire shall be considered to be an energized line until the owner of the line or their authorized representatives state that it is deenergized.

(6) Cab or Operating Enclosure. (a) Necessary clothing and personnel belongings shall be stored in such a manner as to not interfere with access or operation.

(b) Tools, oilcans, waste, extra fuses, and other necessary articles shall be stored in the toolbox, and shall not be permitted to lie loose in or about the cab or operating enclosure. [Order 73-5, § 296-24-24519, filed 5/9/73 and Order 73-4, § 296-24-24519, filed 5/7/73.]

WAC 296-24-260 Helicopters. (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 chin straps.

(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. Handsignals 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. [Order 76-28, § 296-24-260, filed 9/28/76.]

WAC 296-24-293 "A" frames. (1) All timbers for "A" Frames shall be of correct size, length, and condition to sustain the maximum contemplated loads.

(2) "A" Frame timbers shall be braced with two (2) spreaders spaced one-quarter the length of the "A" Frame from each end. Cross bracing shall cross between the two spreaders. Bracing material shall be not less than two-thirds of the rated strength of the "A" Frame timbers.

(3) Tie rods (staybolts) of not less than one-twelfth (1/12) the diameter of the main "A" Frame timbers shall be used. Tie rods shall be placed directly above the upper spreader and directly below the lower spreader. Ends of bolts shall be secured at each end with malleable washers and nuts.

(4) The base of the "A" Frame shall be securely anchored. Elevating type "A" Frames shall be set in pinion-type sockets. Pinion bases shall be securely anchored.

(5) Guy lines shall be of sufficient strength to carry the load imposed upon them and shall be securely fastened in place. [Order 73-5, § 296-24-293, filed 5/9/73 and Order 73-4, § 296-24-293, filed 5/7/73.]

WAC 296-24-294 Rigging. [Order 73-5, § 296-24-294, filed 5/9/73 and Order 73-4, § 296-24-294, filed 5/7/73.]

WAC 296-24-29401 Wire rope. (1) **Safe Loads.** Whenever used in connection with work, employment, occupations or uses to which these standards are applicable, wire rope shall not be subjected to loads in excess of one-fifth (1/5) the breaking load as given in the schedule of the cable manufacturer. Except as required in Standard for material hoists.

(2) **Condemned.** When cables deteriorate through rust, wear, broken wires, undue strain or other conditions to the extent of fifteen per cent (15%) of their original strength, use of cables shall be discontinued.

(3) **Straps and Ribbons.** The strap or steel ribbon type of cable shall not be used in the suspension of scaffolding.

(4) **Inspections.** There shall be not less than monthly inspection of all wire rope in use, and all wire rope must be inspected before put into use.

(5) **Fastening.** The following methods of fastening and attaching wire rope shall be adhered to:

(a) **Sockets.** The end of wire rope to be set into socket fittings held securely with molten babbitt or zinc (not lead). The wires of the cable shall be frayed out and each wire bent toward the outside of socket, so that the end of each wire projects well into the depth of the socket. This method of fastening cables should be left in the hands of an experienced workman in this kind of work.

(b) **Wrapping.** Thimbles spliced into rope and the splice securely wrapped.

(c) **Bolted.** Thimbles inserted and held in place by at least a three bolt clamp or three U-bolt clips. Clamps shall be of standard size for the sizes of the cable in use.

(d) **Lashing.** For temporary work, by passing rope at least twice around large object such as a post, avoiding sharp points and carrying the end back several feet and securing it by clamps, clips or lashing to the cable. [Order 76-29, § 296-24-29401, filed 9/30/76; Order 73-5, § 296-24-29401, filed 5/9/73 and Order 73-4, § 296-24-29401, filed 5/7/73.]

WAC 296-24-29403 Hemp rope. (1) **Quality.** Whenever hemp rope is used it shall be first grade long fiber Manila hemp rope.

(2) **Strength.** Rope shall not be used to support loads in excess of those given in table for hemp and Manila rope.

(3) **Lashed.** Supporting ropes shall be double lashed at each point of suspension.

(4) **Pads.** Where supporting ropes are brought over sharp corners of steel, stone, or other material liable to cut the rope, or are in any other way subject to abrasion, they shall be protected at such points by the use of bagging, wooden blocks or other protective padding.

(5) **Knot Ends.** Rope knots shall have their loose and free ends lashed to the standing part in order to prevent their becoming untied.

(6) **Inspection.** All ropes shall be inspected before used.

(7) **Defective Rope.** Rope badly frayed, rotted, exposed to the action of acid or caustic, or otherwise defective and unsafe, shall be condemned and destroyed to avoid all possibility of future use by mistake. [Order 73-5, § 296-24-29403, filed 5/9/73 and Order 73-4, § 296-24-29403, filed 5/7/73.]

WAC 296-24-29405 Hemp and wire rope slings. (1) **Inspection.** All rope slings shall be inspected thoroughly and regularly at intervals of not more than one month, and when not in use, shall be stored in a dry place.

(2) **Pads.** Rope slings shall be protected with pads or blocks when wrapped around sharp edges of structural shapes, casting, etc.

(3) **Slip-Notch.** Slings shall not be used in single strand slip-notch form.

(4) **Acids.** Hemp rope shall not be used as slings for handling objects contaminated with acid.

(5) **How Attached.** Hand-ropes (guide-ropes) shall not be attached to slings but to hoisting tackle, or (only when necessary) attached to the object handled.

(6) **Strength.** All slings shall be of sufficient strength for handling the imposed loads. See tables given for hemp and wire ropes.

(7) **Double Slings.** Double slings shall be used on all horizontal loads over twelve feet (12') in length, and the distance between the points where slings are attached shall be sufficient to prevent the load from tipping up endwise.

(8) **Spreaders.** Spreaders shall be used where there is a danger of sling ends or "hitches" slipping together.

(9) **Defective—Destroyed.** Defective and unsafe slings shall be destroyed in order to avoid possibility of their being used by mistake. [Order 73-5, § 296-24-29405, filed 5/9/73 and Order 73-4, § 296-24-29405, filed 5/7/73.]

WAC 296-24-29407 Guys. Guy wires and ropes shall be of sufficient strength to carry the load imposed upon them and shall be securely fastened in place. [Order 73-5, § 296-24-29407, filed 5/9/73 and Order 73-4, § 296-24-29407, filed 5/7/73.]

WAC 296-24-29409 Thimbles. Wherever rope is permanently fastened by a single wrap to a metal object less in diameter or shortest measurement than three times the diameter of the rope, a galvanized thimble (of size intended for the rope) shall be inserted between the object and the loop of the rope. [Order 73-5, § 296-24-29409, filed 5/9/73 and Order 73-4, § 296-24-29409, filed 5/7/73.]

WAC 296-24-29411 Blocks and falls. Blocks and falls shall be carefully inspected before being used. Blocks shall be of substantial construction and maintained in good condition while in use. Blocks shall fit the sizes of ropes they carry and shall not chafe or abrade the ropes running through them. [Order 73-5, § 296-24-29411, filed 5/9/73 and Order 73-4, § 296-24-29411, filed 5/7/73.]

WAC 296-24-29413 Chains and cables. (1) If at any time any three foot (3') length of chain is found to have stretched one-third (1/3) the length of a link it shall be discarded.

(2) The practice of placing bolts or nails between two links to shorten chains is prohibited.

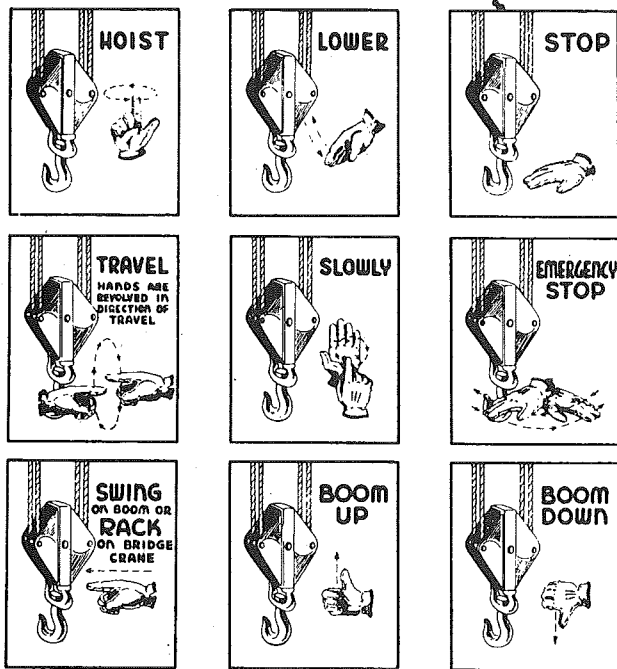
(3) Splicing broken chains by inserting a bolt between two links with the heads of the bolt and the nut sustaining the load, or passing one link through another and inserting a bolt or nail to hold it, is prohibited.

(3) 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.

(4) 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.

(5) Cables shall be periodically inspected. A copy of the report of the inspections of each running cable shall be filed in a place readily accessible to the Department, or authorized representative.

CRANE SIGNALS



CRANE SIGNALS

1. Do not remove the load or the crane unless you understand the floor signal clearly.
2. Be careful that the load does not swing to injure your hook-on man or other floormen; make certain they are in the clear.
3. When raising or lowering the load, see that it will safely clear adjacent stockpiles or machinery.
4. Never pick up a load greater than the capacity of your crane. In case of doubt, call your foreman.
5. Never do ANYTHING that is not safe.
6. Co-operate with your hook-on or floorman. You and he are a team handling a valuable piece of equipment—Never let it become a hazard.

[Order 73-5, § 296-24-29413, filed 5/9/73 and Order 73-4, § 296-24-29413, filed 5/7/73.]

WAC 296-24-29415 Slings. This section applies to slings used in conjunction with other material handling equipment for the movement of material by hoisting, in employments covered by this Chapter. The types of slings covered are those made from alloy steel chain, wire rope, metal mesh, natural or synthetic fiber rope (conventional three strand construction), and synthetic web (nylon, polyester, and polypropylene). [Order 76-6, § 296-24-29415, filed 3/1/76.]

WAC 296-24-29417 Definitions. (1) Angle of Loading. Means the inclination of a leg or branch of a sling measured from the horizontal or vertical plane as shown in Fig. D-5; provided that an angle of loading of five degrees or less from the vertical may be considered a vertical angle of loading.

(2) Basket Hitch. Means a sling configuration whereby the sling is passed under the load and has both ends, end attachments, eyes or handles on the hook or a single master link.

(3) Braided Wire Rope. Means a wire rope formed by plaiting component wire ropes.

(4) Bridle Wire Rope Sling. Means a sling composed of multiple wire rope legs with the top ends gathered in a fitting that goes over the lifting hook.

(5) Cable Laid Endless Sling—mechanical Joint. Means a wire rope sling made endless by joining the ends of a single length of cable laid rope with one or more metallic fittings.

(6) Cable Laid Grommet—hand Tucked. Means an endless wire rope sling made from one length of rope wrapped six times around a core formed by hand tucking the ends of the rope inside the six wraps.

(7) Cable Laid Rope. Means a wire rope composed of six wire ropes wrapped around a fiber or wire rope core.

(8) Cable Laid Rope Sling—mechanical Joint. Means a wire rope sling made from a cable laid rope with eyes fabricated by pressing or swaging [swagging] one or more metal sleeves over the rope junction.

(9) Choker Hitch. Means a sling configuration with one end of the sling passing under the load and through an end attachment, handle or eye on the other end of the sling.

(10) Coating. Means an elastomer or other suitable material applied to a sling or to a sling component to impart desirable properties.

(11) Cross Rod. Means a wire used to join spirals of metal mesh to form a complete fabric. (See Fig. D-2.)

(12) Designated. Means selected or assigned by the employer or the employer's representative as being qualified to perform specific duties.

(13) Equivalent Entity. Means a person or organization (including an employer) which, by possession of equipment, technical knowledge and skills, can perform with equal competence the same repairs and tests as the person or organization with which it is equated.

(14) Fabric (metal mesh). Means the flexible portion of a metal mesh sling consisting of a series of transverse coils and cross rods.

(15) Female Handle (choker). Means a handle with a handle eye and a slot of such dimension as to permit passage of a male handle thereby allowing the use of a metal mesh sling in a choker hitch. (See Fig. D-1.)

(16) Handle. Means a terminal fitting to which metal mesh fabric is attached. (See Fig. D-1.)

(17) Handle Eye. Means an opening in a handle of a metal mesh sling shaped to accept a hook, shackle or other lifting device. (See Fig. D-1.)

(18) Hitch. Means a sling configuration whereby the sling is fastened to an object or load, either directly to it or around it.

(19) Link. Means a single ring of a chain.

(20) Male Handle (triangle). Means a handle with a handle eye.

(21) Master Coupling Link. Means an alloy steel welded coupling link used as an intermediate link to join alloy steel chain to master links. (See Fig. D-3.)

(22) Master Link or Gathering Ring. Means a forged or welded steel link used to support all members (legs) of an alloy steel chain sling or wire rope sling. (See Fig. D-3.)

(23) Mechanical Coupling Link. Means a non-welded, mechanically closed steel link used to attach master links, hooks, etc., to alloy steel chain.

(24) Proof Load. Means the load applied in performance of a proof test.

(25) Proof Test. Means a nondestructive tension test performed by the sling manufacturer or an equivalent entity to verify construction and workmanship of a sling.

(26) Rated Capacity or Working Load Limit. Means the maximum working load permitted by the provisions of this section.

(27) Reach. Means the effective length of an alloy steel chain sling measured from the top bearing surface of the upper terminal component to the bottom bearing surface of the lower terminal component.

(28) Selvage Edge. Means the finished edge of synthetic webbing designed to prevent unraveling.

(29) Sling. Means an assembly which connects the load to the material handling equipment.

(30) Sling Manufacturer. Means a person or organization that assembles sling components into their final form for sale to users.

(31) Spiral. Means a single transverse coil that is the basic element from which metal mesh is fabricated. (See Fig. D-2.)

(32) Strand Laid Endless Sling-mechanical Joint. Means a wire rope sling made endless from one length of rope with the ends joined by one or more metallic fittings.

(33) Strand Laid Grommet-hand Tucked. Means an endless wire rope sling made from one length of strand wrapped six times around a core formed by hand tucking the ends of the strand inside the six wraps.

(34) Strand Laid Rope. Means a wire rope made with strands (usually six or eight) wrapped around a fiber core, wire strand core, or independent wire rope core (IWRC).

(35) Vertical Hitch. Means a method of supporting a load by a single, vertical part or leg of the sling. (See Fig. D-4.) [Order 76-6, § 296-24-29417, filed 3/1/76.]

WAC 296-24-29419 Safe operating practices. Whenever any sling is used, the following practices shall be observed:

(1) Slings that are damaged or defective shall not be used.

(2) Slings shall not be shortened with knots or bolts or other makeshift devices.

(3) Sling legs shall not be kinked.

(4) Slings shall not be loaded in excess of their rated capacities.

(5) Slings used in a basket hitch shall have the loads balanced to prevent slippage.

(6) Slings shall be securely attached to their loads.

(7) Slings shall be padded or protected from the sharp edges of their loads.

(8) Suspended loads shall be kept clear of all obstructions.

(9) All employees shall be kept clear of loads about to be lifted and of suspended loads.

(10) Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load.

(11) Shock loading is prohibited.

(12) A sling shall not be pulled from under a load when the load is resting on the sling. [Order 76-6, § 296-24-29419, filed 3/1/76.]

WAC 296-24-29421 Inspections. Each day before being used, the sling and all fastenings and attachments shall be inspected for damage or defects by a competent person designated by the employer. Additional inspections shall be performed during sling use, where service conditions warrant. Damaged or defective slings shall be immediately removed from service. [Order 76-6, § 296-24-29421, filed 3/1/76.]

WAC 296-24-29423 Alloy steel chain slings. (1) Sling identification. Alloy steel chain slings shall have permanently affixed durable identification stating size, grade, rated capacity and reach.

(2) Attachments.

(a) Hooks, rings, oblong links, pear shaped links, welded or mechanical coupling links or other attachments shall have a rated capacity at least equal to that of the alloy steel chain with which they are used or the sling shall not be used in excess of the rated capacity of the weakest component.

(b) Makeshift links or fasteners formed from bolts or rods, or other such attachments, shall not be used.

(3) Inspections.

(a) In addition to the inspection required by WAC 296-24-29421, a thorough periodic inspection of alloy steel chain slings in use shall be made on a regular basis, to be determined on the basis of:

(i) Frequency of sling use;

(ii) Severity of service conditions;

(iii) Nature of lifts being made; and

(iv) Experience gained on the service life of slings used in similar circumstances. Such inspections shall in no event be at intervals greater than once every 12 months.

(b) The employer shall make and maintain a record of the most recent month in which each alloy steel chain sling was thoroughly inspected, and shall make such record available for examination.

(c) The thorough inspection of alloy steel chain slings shall be performed by a competent person designated by the employer, and shall include a thorough inspection for wear, defective welds, deformation and increase in length. Where such defects or deterioration are present, the sling shall be immediately removed from service.

(4) 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 a certificate of the proof test and shall make it available for examination.

(5) Sling Use. Alloy steel chain slings shall not be used with loads in excess of the rated capacities prescribed in Table D-1. Slings not included in this table shall be used only in accordance with the manufacturer's recommendations.

(6) Safe Operating Temperatures. Alloy steel chain slings shall be permanently removed from service if they are heated above 1000° F. When exposed to service temperatures in excess of 600° F. maximum working load limits permitted in Table D-1 shall be reduced in accordance with the chain or sling manufacturer's recommendations.

(7) Repairing and Reconditioning Alloy Steel Chain Slings.

(a) Worn or damaged alloy steel chain slings or attachments shall not be used until repaired. When welding or heat testing is performed, slings shall not be used unless repaired, reconditioned and proof tested by the sling manufacturer or an equivalent entity.

(b) Mechanical coupling links or low carbon steel repair links shall not be used to repair broken lengths of chain.

(8) Effects of Wear. If the chain size at any point of any links is less than that stated in Table D-2, the sling shall be removed from service.

(9) Deformed Attachments.

(a) Alloy steel chain sling with cracked or deformed master links, coupling links or other components shall be removed from service.

(b) Slings shall be removed from service if hooks are cracked, have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook. [Order 76-29, § 296-24-29423, filed 9/30/76; Order 76-6, § 296-24-29423, filed 3/1/76.]

WAC 296-24-29425 Wire rope slings. (1) Sling Use. Wire rope slings shall not be used with loads in excess of the rated capacities shown in Tables D-3 through D-14. Slings not included in these tables shall be used only in accordance with the manufacturer's recommendations.

(2) Minimum Sling Lengths.

(a) Cable laid and 6x19 and 6x37 slings shall have a minimum clear length of wire rope 10 times the component rope diameter between splices, sleeves or end fittings.

(b) Braided slings shall have a minimum clear length of wire rope 40 times the component rope diameter between the loops or end fittings.

(c) Cable laid grommets, strand laid grommets and endless slings shall have a minimum circumferential length of 96 times their body diameter.

(3) Safe Operating Temperatures. Fiber core wire rope slings of all grades shall be permanently removed

from service if they are exposed to temperatures in excess of 200°F. When nonfiber core wire rope slings of any grade are used at temperatures above 400°F or below minus 60°F, recommendations of the sling manufacturer regarding use at that temperature shall be followed.

(4) End Attachments.

(a) Welding of end attachments, except covers to thimbles, shall be performed prior to the assembly of the sling.

(b) All welded end attachments shall not be used unless proof tested by the manufacturer or equivalent entity at twice their rated capacity prior to initial use. The employer shall retain a certificate of the proof test, and make it available for examination.

(5) Removal From Service. Wire rope slings shall be immediately removed from service if any of the following conditions are present:

(a) Ten randomly distributed broken wires in one rope lay, or five broken wires in one strand in one rope lay.

(b) Wear or scraping of one-third the original diameter of outside individual wires.

(c) Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure.

(d) Evidence of heat damage.

(e) End attachments that are cracked, deformed or worn.

(f) Hooks that have been opened more than 15 percent of the normal throat opening measured at the narrowest point or twisted more than 10 degrees from the plane of the unbent hook.

(g) Corrosion of the rope or end attachments.

(6) Knots and Wire Rope Clips. Eyes in wire rope slings shall not be formed by using knots or wire rope clips. [Order 76-6, § 296-24-29425, filed 3/1/76.]

WAC 296-24-29427 Metal mesh slings. (1) Sling Marking. Each metal mesh sling shall have permanently affixed to it a durable marking that states the rated capacity for vertical basket hitch and choker hitch loadings.

(2) Handles. Handles shall have a rated capacity at least equal to the metal fabric and exhibit no deformation after proof testing.

(3) Attachments of Handles to Fabric. The fabric and handles shall be joined so that:

(a) The rated capacity of the sling is not reduced.

(b) The load is evenly distributed across the width of the fabric.

(c) Sharp edges will not damage the fabric.

(4) Sling Coatings. Coatings which diminish the rated capacity of a sling shall not be applied.

(5) Sling Testing. All new and repaired metal mesh slings, including handles, shall not be used unless proof tested by the manufacturer or equivalent entity at a minimum of 1-1/2 times their rated capacity. Elastomer impregnated slings shall be proof tested before coating.

(6) Proper Use of Metal Mesh Slings. Metal mesh slings shall not be used to lift loads in excess of their rated capacities as prescribed in Table D-15. Slings not included in this table shall be used only in accordance with the manufacturer's recommendations.

(7) Safe Operating Temperatures. Metal mesh slings which are not impregnated with elastomers may be used in a temperature range from minus 20°F to plus 550°F without decreasing the working load limit. Metal mesh slings impregnated with polyvinyl chloride or neoprene may be used only in a temperature range from zero degrees to plus 200°F. For operations outside these temperature ranges or for metal mesh slings impregnated with other materials, the sling manufacturer's recommendations shall be followed.

(8) Repairs.

(a) Metal mesh slings which are repaired shall not be used unless repaired by a metal mesh sling manufacturer or an equivalent entity.

(b) Once repaired, each sling shall be permanently marked or tagged, or a written record maintained, to indicate the date and nature of the repairs and the person or organization that performed the repairs. Records of repairs shall be made available for examination.

(9) Removal from Service. Metal mesh slings shall be immediately removed from service if any of the following conditions are present:

(a) A broken weld or broken brazed joint along the sling edge.

(b) Reduction in wire diameter of 25 per cent due to abrasion or 15 per cent due to corrosion.

(c) Lack of flexibility due to distortion of the fabric.

(d) Distortion of the female handle so that the depth of the slot is increased more than 10 per cent.

(e) Distortion of either handle so that the width of the eye is decreased more than 10 per cent.

(f) A 15 per cent reduction of the original cross sectional area of metal at any point around the handle eye.

(g) Distortion of either handle out of its plane. [Order 76-6, § 296-24-29427, filed 3/1/76.]

WAC 296-24-29429 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.

(b) Fiber rope slings shall have a diameter of curvature meeting at least the minimums specified in Figs. D-4 and D-5.

(c) 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 10 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 60 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. [Order 76-6, § 296-24-29429, filed 3/1/76.]

WAC 296-24-29431 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.

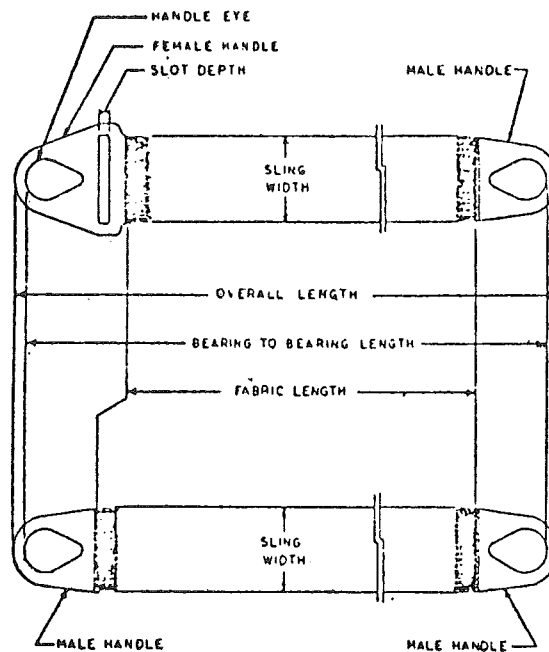


FIG. D-1

Metal Mesh Sling (Typical)

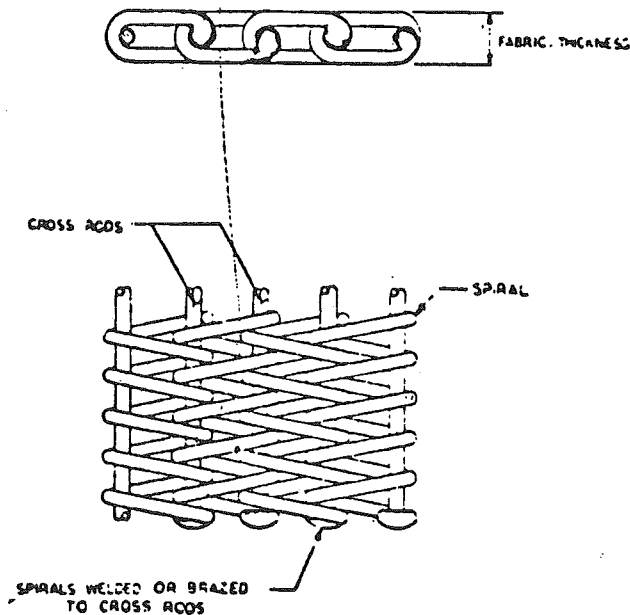


FIG. D-2

Metal Mesh Construction

- (1) Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical as shown in Figure D-5.
- (2) Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load, as shown in Figure D-5.
- (3) Quadruple sling rating is same as triple sling because normal lifting practice may not distribute load uniformly to all 4 legs.

TABLE D-1: Part 2—Triple and Quadruple Slings

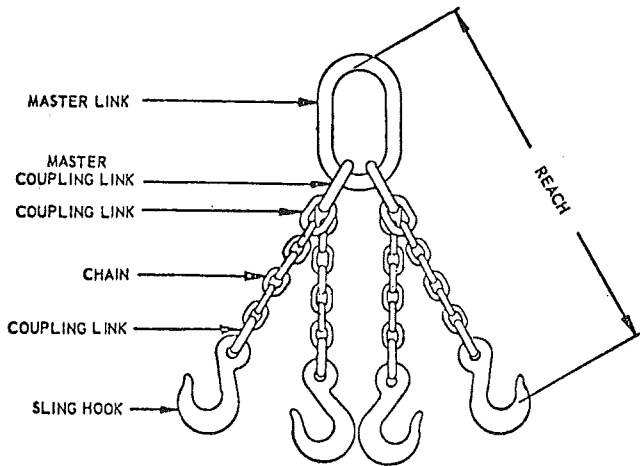


FIG. D-3.

MAJOR COMPONENTS OF A QUADRUPLE SLING.

Chain Size, Inches	Single Branch Sling - degree Loading	Triple and Quadruple Sling ⁽³⁾ Vertical Angle ⁽¹⁾		
		30 degree	45 degree	60 degree
		Horizontal Angle ⁽²⁾		
		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	16,500	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

- (1) Rating of multileg slings adjusted for angle of loading measured as the included angle between the inclined leg and the vertical as shown in Figure D-5.
- (2) Rating of multileg slings adjusted for angle of loading between the inclined leg and the horizontal plane of the load, as shown in Figure D-5.
- (3) Quadruple sling rating is same as triple sling because normal lifting practice may not distribute load uniformly to all 4 legs.

TABLE D-1

RATED CAPACITY (WORKING LOAD LIMIT), FOR ALLOY STEEL CHAIN SLINGS* RATED CAPACITY (WORKING LOAD LIMIT), POUNDS

TABLE D-1: Part 1—Double Slings

Chain Size, Inches	Single Branch Sling - degree Loading	Double Sling ¹ Vertical Angle ¹		
		30 degree	45 degree	60 degree
		Horizontal Angle ²		
		60 degree	45 degree	30 degree
1/4	3,250	5,650	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 D-2

MINIMUM ALLOWABLE CHAIN SIZE AT ANY POINT OF LINK

Chain Size, Inches	Minimum Allowable Chain Size, Inches
1/4	13/64
3/8	19/64
1/2	25/64
5/8	31/64
3/4	19/32
7/8	45/64
1	13/16
1-1/8	29/32
1-1/4	1
1-3/8	1- 3/32
1-1/2	1- 3/16
1-3/4	1-13/32

TABLE D-3

RATED CAPACITIES FOR SINGLE LEG SLINGS 6x19 and 6x37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH FIBER CORE (FC)

Rope		Rated Capacities, Tons (2,000 lb)								
Dia. (Inches)	Constr.	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 columns.
 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.

TABLE D-4

RATED CAPACITIES FOR SINGLE LEG SLINGS 6x19 and 6x37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)

Rope		Rated Capacities, Tons (2,000 lb)								
Dia. (Inches)	Constr.	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

TABLE D-4—cont.

Rope		Rated Capacities, Tons (2,000 lb)								
Dia. (Inches)	Constr.	Vertical			Choker			Vertical Basket*		
		HT	MS	S	HT	MS	S	HT	MS	S
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 1 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.

TABLE D-5

RATED CAPACITIES FOR SINGLE LEG SLINGS CABLE LAID ROPE - MECHANICAL SPLICE ONLY 7x7x7 & 7x7x19 CONSTRUCTIONS GALVANIZED AIRCRAFT GRADE ROPE 7x6x19 IWRC CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	Vertical	Choker	Vertical Basket*	
1/4	7x7x7	0.50	0.38	1.0	
3/8	7x7x7	1.1	0.81	2.0	
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	
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.

TABLE D-6

RATED CAPACITIES FOR SINGLE LEG SLINGS 8-PART AND 6-PART BRAIDED ROPE 6x7 AND 6x19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7x7 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	6x7	0.42	0.32	0.32	0.24	0.74	0.55
1/8	6x7	0.76	0.57	0.57	0.42	1.3	0.98
3/16	6x7	1.7	1.3	1.3	0.94	2.9	2.2
3/32	7x7	0.51	0.39	0.38	0.29	0.89	0.67
1/8	7x7	0.95	0.71	0.71	0.53	1.6	1.2
3/16	7x7	2.1	1.5	1.5	1.2	3.6	2.7
3/16	6x19	1.7	1.3	1.3	0.98	3.0	2.2
1/4	6x19	3.1	2.3	2.3	1.7	5.3	4.0
5/16	6x19	4.8	3.6	3.6	2.7	8.3	6.2
3/8	6x19	6.8	5.1	5.1	3.8	12.0	8.9
7/16	6x19	9.3	6.9	6.9	5.2	16.0	12.0
1/2	6x19	12.0	9.0	9.0	6.7	21.0	15.0
9/16	6x19	15.0	11.0	11.0	8.5	26.0	20.0
5/8	6x19	19.0	14.0	14.0	10.0	32.0	24.0
3/4	6x19	27.0	20.0	20.0	15.0	46.0	35.0
7/8	6x19	36.0	27.0	27.0	20.0	62.0	47.0
1	6x19	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.

TABLE D-7

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS 6x19 AND 6x37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH FIBER CORE (FC)

TABLE D-7: Part 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6x19	0.85	0.88	0.70	0.72	0.49	0.51
5/16	6x19	1.3	1.4	1.1	1.1	0.76	0.79
3/8	6x19	1.8	1.9	1.5	1.6	1.1	1.1
7/16	6x19	2.5	2.6	2.0	2.2	1.4	1.5
1/2	6x19	3.2	3.4	2.6	2.8	1.8	2.0
9/16	6x19	4.0	4.3	3.2	3.5	2.3	2.5
5/8	6x19	4.8	5.3	4.0	4.4	2.8	3.1
3/4	6x19	6.8	7.6	5.5	6.2	3.9	4.4
7/8	6x19	8.9	10.0	7.3	8.4	5.1	5.9
1	6x19	11.0	13.0	9.4	11.0	6.7	7.7
1-1/8	6x19	14.0	16.0	12.0	13.0	8.4	9.5
1-1/4	6x37	17.0	19.0	14.0	16.0	9.8	11.0
1-3/8	6x37	20.0	23.0	17.0	19.0	12.0	13.0

TABLE D-7: Part 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1-1/2	6x37	24.0	27.0	20.0	22.0	14.0	16.0
1-5/8	6x37	28.0	32.0	23.0	26.0	16.0	18.0
1-3/4	6x37	33.0	37.0	27.0	30.0	19.0	21.0
2	6x37	43.0	48.0	35.0	39.0	25.0	28.0

HT = Hand Tucked Splice.
 MS = Mechanical Splice.

TABLE D-7: Part 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Ver 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6x19	1.3	1.3	1.0	1.1	0.74	0.76
5/16	6x19	2.0	2.0	1.6	1.7	1.1	1.2
3/8	6x19	2.8	2.9	2.3	2.4	1.6	1.7
7/16	6x19	3.7	4.0	3.0	3.2	2.1	2.3
1/2	6x19	4.8	5.1	3.9	4.2	2.8	3.0
9/16	6x19	6.0	6.5	4.9	5.3	3.4	3.7
5/8	6x19	7.3	8.0	5.9	6.5	4.2	4.6
3/4	6x19	10.0	11.0	8.3	9.3	5.8	6.6
7/8	6x19	13.0	15.0	11.0	13.0	7.7	8.9
1	6x19	17.0	20.0	14.0	16.0	10.0	11.0
1-1/8	6x19	22.0	24.0	18.0	20.0	13.0	14.0
1-1/4	6x37	25.0	29.0	21.0	23.0	15.0	17.0
1-3/8	6x37	31.0	35.0	25.0	28.0	18.0	20.0
1-1/2	6x37	36.0	41.0	30.0	33.0	21.0	24.0
1-5/8	6x37	43.0	48.0	35.0	39.0	25.0	28.0
1-3/4	6x37	49.0	56.0	40.0	45.0	28.0	32.0
2	6x37	64.0	72.0	52.0	59.0	37.0	41.0

HT = Hand Tucked Splice.
 MS = Mechanical Splice.

TABLE D-8

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS 6x19 AND 6x37 CLASSIFICATION IMPROVED PLOW STEEL GRADE ROPE WITH INDEPENDENT WIRE ROPE CORE (IWRC)

TABLE D-8: Part 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	Vert 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6x19	0.92	0.97	0.75	0.79	0.53	0.56
5/16	6x19	1.4	1.5	1.1	1.2	0.81	0.87

TABLE D-8: Part 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	2-Leg Bridle Slings					
		Vert 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
3/8	6x19	2.0	2.1	1.6	1.8	1.1	1.2
7/16	6x19	2.7	2.9	2.2	2.4	1.5	1.7
1/2	6x19	3.4	3.8	2.8	3.1	2.0	2.2
9/16	6x19	4.3	4.8	3.5	3.9	2.5	2.7
5/8	6x19	5.2	5.9	4.2	4.8	3.0	3.4
3/4	6x19	7.3	8.4	5.9	6.9	4.2	4.9
7/8	6x19	9.6	11.0	7.8	9.3	5.5	6.6
1	6x19	12.0	15.0	10.0	12.0	7.2	8.5
1-1/8	6x19	16.0	18.0	13.0	15.0	9.0	10.0
<hr/>							
1-1/4	6x37	18.0	21.0	15.0	17.0	10.0	12.0
1-3/8	6x37	22.0	25.0	18.0	21.0	13.0	15.0
1-1/2	6x37	26.0	30.0	21.0	25.0	15.0	17.0
1-5/8	6x37	31.0	35.0	25.0	29.0	18.0	20.0
1-3/4	6x37	35.0	41.0	29.0	33.0	20.0	24.0
2	6x37	46.0	53.0	37.0	43.0	26.0	30.0

HT = Hand Tucked Splice.
MS = Mechanical Splice.

TABLE D-8: Part 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)					
Dia. (Inches)	Constr.	3-Leg Bridle Sling					
		Vert 30 degree Horz 60 degree		45 degree Angle		Vert 60 degree Horz 30 degree	
		HT	MS	HT	MS	HT	MS
1/4	6x19	1.4	1.4	1.1	1.2	0.79	0.84
5/16	6x19	2.1	2.3	1.7	1.8	1.2	1.3
3/8	6x19	3.0	3.2	2.4	2.6	1.7	1.9
7/16	6x19	4.0	4.4	3.3	3.6	2.3	2.5
1/2	6x19	5.1	5.7	4.2	4.6	3.0	3.3
9/16	6x19	6.4	7.1	5.2	5.8	3.7	4.1
5/8	6x19	7.8	8.8	6.4	7.2	4.5	5.1
3/4	6x19	11.0	13.0	8.9	10.0	6.3	7.3
7/8	6x19	14.0	17.0	12.0	14.0	8.3	9.9
1	6x19	19.0	22.0	15.0	18.0	11.0	13.0
1-1/8	6x19	23.0	27.0	19.0	22.0	13.0	16.0
<hr/>							
1-1/4	6x37	27.0	32.0	22.0	26.0	16.0	18.0
1-3/8	6x37	33.0	38.0	27.0	31.0	19.0	22.0
1-1/2	6x37	39.0	45.0	32.0	37.0	23.0	26.0
1-5/8	6x37	46.0	53.0	38.0	43.0	27.0	31.0
1-3/4	6x37	53.0	61.0	43.0	50.0	31.0	35.0
2	6x37	68.0	79.0	56.0	65.0	40.0	46.0

HT = Hand Tucked Splice.
MS = Mechanical Splice.

TABLE D-9

RATED CAPACITIES FOR 2-LEG & 3-LEG BRIDLE SLINGS CABLE LAID ROPE - MECHANICAL SPLICE ONLY 7x7x7 AND 7x7x19 CONSTRUCTIONS GALVANIZED AIR-CRAFT GRADE ROPE 7x6x19 IWRC CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE

TABLE D-9: Part 1—2-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	2-Leg Bridle Sling			
		Vert 30 deg Horz 60 deg		45 degree Angle	
		Vert 30 deg Horz 60 deg	45 degree Angle	Vert 60 deg Horz 30 deg	Vert 60 deg Horz 30 deg
1/4	7x7x7	0.87	0.71	0.50	
3/8	7x7x7	1.9	1.5	1.1	
1/2	7x7x7	3.2	2.6	1.8	
5/8	7x7x7	4.8	3.9	2.8	
3/4	7x7x7	6.6	5.4	3.8	
<hr/>					
5/8	7x7x19	5.0	4.1	2.9	
3/4	7x7x19	7.0	5.7	4.1	
7/8	7x7x19	9.3	7.6	5.4	
1	7x7x19	12.0	9.7	6.9	
1-1/8	7x7x19	14.0	12.0	8.2	
1-1/4	7x7x19	17.0	14.0	9.9	
<hr/>					
3/4	7x6x19 IWRC	6.6	5.4	3.8	
7/8	7x6x19 IWRC	8.7	7.1	5.0	
1	7x6x19 IWRC	11.0	9.0	6.4	
1-1/8	7x6x19 IWRC	13.0	11.0	7.7	
1-1/4	7x6x19 IWRC	16.0	13.0	9.2	
1-5/16	7x6x19 IWRC	17.0	14.0	10.0	
1-3/8	7x6x19 IWRC	19.0	15.0	11.0	
1-1/2	7x6x19 IWRC	22.0	18.0	13.0	

TABLE D-9: Part 2—3-Leg Bridle Slings

Rope		Rated Capacities, Tons (2,000 lb)			
Dia. (Inches)	Constr.	3-Leg Bridle Sling			
		Vert 30 deg Horz 60 deg		45 degree Angle	
		Vert 30 deg Horz 60 deg	45 degree Angle	Vert 60 deg Horz 30 deg	Vert 60 deg Horz 30 deg
1/4	7x7x7	1.3	1.1	0.75	
3/8	7x7x7	2.8	2.3	1.6	
1/2	7x7x7	4.8	3.9	2.8	
5/8	7x7x7	7.2	5.9	4.2	
3/4	7x7x7	9.9	8.1	5.7	
<hr/>					
5/8	7x7x19	7.5	6.1	4.3	
3/4	7x7x19	10.0	8.6	6.1	
7/8	7x7x19	14.0	11.0	8.1	
1	7x7x19	18.0	14.0	10.0	
1-1/8	7x7x19	21.0	17.0	12.0	
1-1/4	7x7x19	26.0	21.0	15.0	
<hr/>					
3/4	7x6x19 IWRC	9.9	8.0	5.7	
7/8	7x6x19 IWRC	13.0	11.0	7.5	
1	7x6x19 IWRC	17.0	13.0	9.6	
1-1/8	7x6x19 IWRC	20.0	16.0	11.0	
1-1/4	7x6x19 IWRC	24.0	20.0	14.0	
1-5/16	7x6x19 IWRC	26.0	21.0	15.0	
1-3/8	7x6x19 IWRC	28.0	23.0	16.0	
1-1/2	7x6x19 IWRC	33.0	27.0	19.0	

TABLE D-10

RATED CAPACITIES FOR 2-LEG AND 3-LEG BRIDLE SLINGS 8-PART AND 6-PART BRAIDED ROPE 6x7 AND 6x19 CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE 7x7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE

TABLE D-10: Part 1—2-Leg Bridle Slings




Component		Rated Capacities, Tons (2,000 lb)					
Rope		2-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	60 degree	8-Part	6-Part	8-Part	6-Part
3/32	6x7	0.74	0.55	0.60	0.45	0.42	0.32
1/8	6x7	1.3	0.98	1.1	0.80	0.76	0.57
3/16	6x7	2.9	2.2	2.4	1.8	1.7	1.3
3/32	7x7	0.89	0.67	0.72	0.55	0.51	0.39
1/8	7x7	1.6	1.2	1.3	1.0	0.95	0.71
3/16	7x7	3.6	2.7	2.9	2.2	2.1	1.5
3/16	6x19	3.0	2.2	2.4	1.8	1.7	1.3
1/4	6x19	5.3	4.0	4.3	3.2	3.1	2.3
5/16	6x19	8.3	6.2	6.7	5.0	4.8	3.6
3/8	6x19	12.0	8.9	9.7	7.2	6.8	5.1
7/16	6x19	16.0	12.0	13.0	9.8	9.3	6.9
1/2	6x19	21.0	15.0	17.0	13.0	12.0	9.0
9/16	6x19	26.0	20.0	21.0	16.0	15.0	11.0
5/8	6x19	32.0	24.0	26.0	20.0	19.0	14.0
3/4	6x19	46.0	35.0	38.0	28.0	27.0	20.0
7/8	6x19	62.0	47.0	51.0	38.0	36.0	27.0
1	6x19	81.0	61.0	66.0	50.0	47.0	35.0

TABLE D-10: Part 2—3-Leg Bridle Slings

Component		Rated Capacities, Tons (2,000 lb)					
Rope		3-Leg Bridle Slings					
Dia. (Inches)	Constr.	Vert 30 degree		45 degree		Vert 60 degree	
		Horz 60 degree	60 degree	8-Part	6-Part	8-Part	6-Part
3/32	6x7	1.1	0.83	0.90	0.68	0.64	0.48
1/8	6x7	2.0	1.5	1.6	1.2	1.1	0.85
3/16	6x7	4.4	3.3	3.6	2.7	2.5	1.9
3/32	7x7	1.3	1.0	1.1	0.82	0.77	0.58
1/8	7x7	2.5	1.8	2.0	1.5	1.4	1.1
3/16	7x7	5.4	4.0	4.4	3.3	3.1	2.3
3/16	6x19	4.5	3.4	3.7	2.8	2.6	1.9
1/4	6x19	8.0	6.0	6.5	4.9	4.6	3.4
5/16	6x19	12.0	9.3	10.0	7.6	7.1	5.4
3/8	6x19	18.0	13.0	14.0	11.0	10.0	7.7
7/16	6x19	24.0	18.0	20.0	15.0	14.0	10.0
1/2	6x19	31.0	23.0	25.0	19.0	18.0	13.0
9/16	6x19	39.0	29.0	32.0	24.0	23.0	17.0
5/8	6x19	48.0	36.0	40.0	30.0	28.0	21.0
3/4	6x19	69.0	52.0	56.0	42.0	40.0	30.0
7/8	6x19	94.0	70.0	76.0	57.0	54.0	40.0
1	6x19	122.0	91.0	99.0	74.0	70.0	53.0

TABLE D-11

RATED CAPACITIES FOR STRAND LAID GROMMET - HAND TUCKED IMPROVED PLOW STEEL GRADE ROPE

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.			
		Vertical	Choker	Vertical Basket*
1/4	7x19	0.85	0.64	1.7
5/16	7x19	1.3	1.0	2.6
3/8	7x19	1.9	1.4	3.8
7/16	7x19	2.6	1.9	5.2
1/2	7x19	3.3	2.5	6.7
9/16	7x19	4.2	3.1	8.4
5/8	7x19	5.2	3.9	10.00
3/4	7x19	7.4	5.6	15.0
7/8	7x19	10.0	7.5	20.0
1	7x19	13.0	9.7	26.0
1-1/8	7x19	16.0	12.0	32.0
1-1/4	7x37	18.0	14.0	37.0
1-3/8	7x37	22.0	16.0	44.0
1-1/2	7x37	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.

TABLE D-12

RATED CAPACITIES FOR CABLE LAID GROMMET - HAND TUCKED 7x6x7 AND 7x6x19 CONSTRUCTIONS IMPROVED PLOW STEEL GRADE ROPE 7x7x7 CONSTRUCTION GALVANIZED AIRCRAFT GRADE ROPE







CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.			
		Vertical	Choker	Vertical Basket*
3/8	7x6x7	1.3	0.95	2.5
9/16	7x6x7	2.8	2.1	5.6
5/8	7x6x7	3.8	2.8	7.6

TABLE D-12—cont.

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.			
		Vertical	Choker	Vertical Basket*
3/8	7x7x7	1.6	1.2	3.2
9/16	7x7x7	3.5	2.6	6.9
5/8	7x7x7	4.5	3.4	9.0
5/8	7x6x19	3.9	3.0	7.9
3/4	7x6x19	5.1	3.8	10.0
15/16	7x6x19	7.9	5.9	16.0
1-1/8	7x6x19	11.0	8.4	22.0
1-5/16	7x6x19	15.0	11.0	30.0
1-1/2	7x6x19	19.0	14.0	39.0
1-11/16	7x6x19	24.0	18.0	49.0
1-7/8	7x6x19	30.0	22.0	60.0
2-1/4	7x6x19	42.0	31.0	84.0
2-5/8	7x6x19	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.

TABLE D-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	6x19 IWRC	0.92	0.69	1.8
3/8	6x19 IWRC	2.0	1.5	4.1
1/2	6x19 IWRC	3.6	2.7	7.2
5/8	6x19 IWRC	5.6	4.2	11.0
3/4	6x19 IWRC	8.0	6.0	16.0
7/8	6x19 IWRC	11.0	8.1	21.0
1	6x19 IWRC	14.0	10.0	28.0
1-1/8	6x19 IWRC	18.0	13.0	35.0
1-1/4	6x37 IWRC	21.0	15.0	41.0
1-3/8	6x37 IWRC	25.0	19.0	50.0

TABLE D-13—cont.

ROPE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.			
		Vertical	Choker	Vertical Basket*
1-1/2	6x37 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.

TABLE D-14

RATED CAPACITIES FOR CABLE LAID ENDLESS SLINGS—MECHANICAL JOINT 7x7x7 AND 7x7x19 CONSTRUCTIONS GALVANIZED AIRCRAFT GRADE ROPE 7x6x19 IWRC CONSTRUCTION IMPROVED PLOW STEEL GRADE ROPE




CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.			
		Vertical	Choker	Vertical Basket*
1/4	7x7x7	0.83	0.62	1.6
3/8	7x7x7	1.8	1.3	3.5
1/2	7x7x7	3.0	2.3	6.1
5/8	7x7x7	4.5	3.4	9.1
3/4	7x7x7	6.3	4.7	12.0
5/8	7x7x19	4.7	3.5	9.5
3/4	7x7x19	6.7	5.0	13.0
7/8	7x7x19	8.9	6.6	18.0
1	7x7x19	11.0	8.5	22.0
1-1/8	7x7x19	14.0	10.0	28.0
1-1/4	7x7x19	17.0	12.0	33.0
3/4	7x6x19 IWRC	6.2	4.7	12.0
7/8	7x6x19 IWRC	8.3	6.2	16.0
1	7x6x19 IWRC	10.0	7.9	21.0
1-1/8	7x6x19 IWRC	13.0	9.7	26.0
1-1/4	7x6x19 IWRC	16.0	12.0	31.0
1-3/8	7x6x19 IWRC	18.0	14.0	37.0

TABLE D-14—cont.

CABLE BODY		RATED CAPACITIES, TONS (2,000 lb)		
Dia. (Inches)	Constr.	Vertical	Choker	Vertical Basket*
1-1/2	7x6x19 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.

TABLE D-15

RATED CAPACITIES
 CARBON STEEL & STAINLESS STEEL
 METAL MESH SLINGS

EFFECT OF ANGLE ON RATED CAPACITIES
 IN BASKET HITCH

SLING WIDTH IN INCHES		30 deg	45 deg	60 deg
		Vertical 60 deg Horizontal	Vertical 45 deg Horizontal	Vertical 30 deg Horizontal

Heavy Duty-10 Ga 35 Spirals/Ft of sling width

2	1,500	3,000	2,600	2,100	1,500
3	2,700	5,400	4,700	3,800	2,700
4	4,000	8,000	6,900	5,600	4,000
6	6,000	12,000	10,400	8,400	6,000
8	8,000	16,000	13,800	11,300	8,000
10	10,000	20,000	17,000	14,100	10,000
12	12,000	24,000	20,700	16,900	12,000
14	14,000	28,000	24,200	19,700	14,000
16	16,000	32,000	27,700	22,600	16,000
18	18,000	36,000	31,100	25,400	18,000
20	20,000	40,000	34,600	28,200	20,000

Medium Duty-12 Ga 43 Spirals/Ft of sling width

2	1,350	2,700	2,300	1,900	1,400
3	2,000	4,000	3,500	2,800	2,000
4	2,700	5,400	4,700	3,800	2,700
6	4,500	9,000	7,800	6,400	4,500
8	6,000	12,000	10,400	8,500	6,000
10	7,500	15,000	13,000	10,600	7,500
12	9,000	18,000	15,600	12,700	9,000
14	10,500	21,000	18,200	14,800	10,500
16	12,000	24,000	20,800	17,000	12,000
18	13,500	27,000	23,400	19,100	13,500
20	15,000	30,000	26,000	21,200	15,000

TABLE D-15—cont.

EFFECT OF ANGLE ON RATED CAPACITIES
 IN BASKET HITCH

SLING WIDTH IN INCHES		30 deg	45 deg	60 deg
		Vertical 60 deg Horizontal	Vertical 45 deg Horizontal	Vertical 30 deg Horizontal

Light Duty-14 Ga 59 Spirals/Ft of sling width

2	900	1,800	1,600	1,300	900
3	1,400	2,800	2,400	2,000	1,400
4	2,000	4,000	3,500	2,800	2,000
6	3,000	6,000	5,200	4,200	3,000
8	4,000	8,000	6,900	5,700	4,000
10	5,000	10,000	8,600	7,100	5,000
12	6,000	12,000	10,400	8,500	6,000
14	7,000	14,000	12,100	9,900	7,000
16	8,000	16,000	13,900	11,300	8,000
18	9,000	18,000	15,600	12,700	9,000
20	10,000	20,000	17,300	14,100	10,000

TABLE D-16

MANILA ROPE SLINGS

TABLE D-16: Part 1—Eye and Eye Sling

Rope Dia- Meter		EYE & EYE SLING						
		BASKET HITCH				Angle of Rope to Vertical		
Nomi- nal Inches	Nominal Weight per 100 ft. Pounds	Angle of Rope to Horizontal				Angle of Rope to Vertical		
		90°	60°	45°	30°	0°	30°	45°	60°
1/2	7.5	480	240	960	830	680	480	480
9/16	10.4	620	310	1,240	1,070	875	620	620
5/8	13.3	790	395	1,580	1,370	1,120	790	790
3/4	16.7	970	485	1,940	1,680	1,370	970	970
13/16	19.5	1,170	585	2,340	2,030	1,650	1,170	1,170
7/8	22.5	1,390	695	2,780	2,410	1,970	1,390	1,390
1"	27.0	1,620	810	3,240	2,810	2,290	1,620	1,620
1 1/16	31.3	1,890	945	3,780	3,270	2,670	1,890	1,890
1 1/8	36.0	2,160	1,080	4,320	3,740	3,050	2,160	2,160
1 1/4	41.7	2,430	1,220	4,860	4,210	3,440	2,430	2,430
1 5/16	47.9	2,700	1,350	5,400	4,680	3,820	2,700	2,700
1 1/2	59.9	3,330	1,670	6,660	5,770	4,710	3,330	3,330
1 5/8	74.6	4,050	2,030	8,100	7,010	5,730	4,050	4,050
1 3/4	89.3	4,770	2,390	9,540	8,260	6,740	4,770	4,770
2"	107.5	5,580	2,790	11,200	9,660	7,890	5,580	5,580
2 1/8	125.0	6,480	3,240	13,000	11,200	9,160	6,480	6,480
2 1/4	146.0	7,380	3,690	14,800	12,800	10,400	7,380	7,380
2 1/2	166.7	8,370	4,190	16,700	14,500	11,800	8,370	8,370
2 5/8	190.8	9,360	4,680	18,700	16,200	13,200	9,360	9,360

See Figures D-4 & D-5 for sling configuration description.

TABLE D-16: Part 2—Endless Sling

		ENDLESS SLING							
		BASKET HITCH							
Rope Dia- Meter	Nominal Weight per 100 ft.	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				Vertical 60°	
				90°	60°	45°	30°		
Nominal in Inches	100 ft. in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				60°	
				0°	30°	45°	60°		
1/2	7.5	865	430	1,730	1,500	1,220	865		
9/16	10.4	1,120	560	2,230	1,930	1,580	1,120		
5/8	13.3	1,420	710	2,840	2,460	2,010	1,420		
3/4	16.7	1,750	875	3,490	3,020	2,470	1,750		
13/16	19.5	2,110	1,050	4,210	3,650	2,980	2,110		
7/8	22.5	2,500	1,250	5,000	4,330	3,540	2,500		
1"	27.0	2,920	1,460	5,830	5,050	4,120	2,920		
1 1/16	31.3	3,400	1,700	6,800	5,890	4,810	3,400		
1 1/8	36.0	3,890	1,940	7,780	6,730	5,500	3,890		
1 1/4	41.7	4,370	2,190	8,750	7,580	6,190	4,370		
1 5/16	47.9	4,860	2,430	9,720	8,420	6,870	4,860		
1 1/2	59.9	5,990	3,000	12,000	10,400	8,480	5,990		
1 5/8	74.6	7,290	3,650	14,600	12,600	10,300	7,290		
1 3/4	89.3	8,590	4,290	17,200	14,900	12,100	8,590		
2"	107.5	10,000	5,020	20,100	17,400	14,200	10,000		
2 1/8	125.0	11,700	5,830	23,300	20,200	16,500	11,700		
2 1/4	146.0	13,300	6,640	26,600	23,000	18,800	13,300		
2 1/2	166.7	15,100	7,530	30,100	26,100	21,300	15,100		
2 5/8	190.8	16,800	8,420	33,700	29,200	23,800	16,800		

See Figures D-4 & D-5 for sling configuration description.

TABLE D-17: Part 2—Endless Sling

		ENDLESS SLING							
		BASKET HITCH							
Rope Dia- Meter	Nominal Weight per 100 ft.	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				Vertical 60°	
				90°	60°	45°	30°		
Nominal in Inches	100 ft. in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				60°	
				0°	30°	45°	60°		
1/2	6.5	1,140	570	2,290	1,980	1,620	1,140		
9/16	8.3	1,420	710	2,840	2,460	2,010	1,420		
5/8	10.5	1,850	925	3,710	3,210	2,620	1,850		
3/4	14.5	2,540	1,270	5,080	4,400	3,590	2,540		
13/16	17.0	3,020	1,510	6,050	5,240	4,280	3,020		
7/8	20.0	3,560	1,780	7,130	6,170	5,040	3,560		
1"	26.0	4,460	2,230	8,930	7,730	6,310	4,460		
1 1/16	29.0	5,130	2,570	10,300	8,890	7,260	5,130		
1 1/8	34.0	5,890	2,940	11,800	10,200	8,330	5,890		
1 1/4	40.0	6,680	3,340	13,400	11,600	9,450	6,680		
1 5/16	45.0	7,670	3,830	15,300	13,300	10,800	7,670		
1 1/2	55.0	9,450	4,730	18,900	16,400	13,400	9,450		
1 5/8	68.0	11,600	5,800	23,200	20,100	16,400	11,600		
1 3/4	83.0	13,900	6,950	27,800	24,100	19,700	13,900		
2"	95.0	16,400	8,200	32,800	28,400	23,200	16,400		
2 1/8	109.0	18,900	9,450	37,800	32,700	26,700	18,900		
2 1/4	129.0	22,300	11,200	44,600	38,700	31,600	22,300		
2 1/2	149.0	25,000	12,500	50,000	43,300	35,400	25,000		
2 5/8	168.0	28,800	14,400	57,600	49,900	40,700	28,800		

See Figures D-4 & D-5 for sling configuration description.

TABLE D-17

NYLON ROPE SLINGS

TABLE D-17: Part 1—Eye and Eye Sling

		EYE & EYE SLING							
		BASKET HITCH							
Rope Dia- Meter	Nominal Weight per 100 ft.	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				Vertical 60°	
				90°	60°	45°	30°		
Nominal in Inches	100 ft. in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				60°	
				0°	30°	45°	60°		
1/2	6.5	635	320	1,270	1,100	900	635		
9/16	8.3	790	395	1,580	1,370	1,120	790		
5/8	10.5	1,030	515	2,060	1,780	1,460	1,030		
3/4	14.5	1,410	705	2,820	2,440	1,990	1,410		
13/16	17.0	1,680	840	3,360	2,910	2,380	1,680		
7/8	20.0	1,980	990	3,960	3,430	2,800	1,980		
1"	26.0	2,480	1,240	4,960	4,300	3,510	2,480		
1 1/16	29.0	2,850	1,430	5,700	4,940	4,030	2,850		
1 1/8	34.0	3,270	1,640	6,540	5,660	4,620	3,270		
1 1/4	40.0	3,710	1,860	7,420	6,430	5,250	3,710		
1 5/16	45.0	4,260	2,130	8,520	7,380	6,020	4,260		
1 1/2	55.0	5,250	2,630	10,500	9,090	7,420	5,250		
1 5/8	68.0	6,440	3,220	12,900	11,200	9,110	6,440		
1 3/4	83.0	7,720	3,860	15,400	13,400	10,900	7,720		
2"	95.0	9,110	4,560	18,200	15,800	12,900	9,110		
2 1/8	109.0	10,500	5,250	21,000	18,200	14,800	10,500		
2 1/4	129.0	12,400	6,200	24,800	21,500	17,500	12,400		
2 1/2	149.0	13,900	6,950	27,800	24,100	19,700	13,900		
2 5/8	168.0	16,000	8,000	32,000	27,700	22,600	16,000		

See Figures D-4 & D-5 for sling configuration description.

TABLE D-18

POLYESTER ROPE SLINGS

TABLE D-18: Part 1—Eye and Eye Sling

		EYE & EYE SLING							
		BASKET HITCH							
Rope Dia- Meter	Nominal Weight per 100 ft.	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Horizontal				Vertical 60°	
				90°	60°	45°	30°		
Nominal in Inches	100 ft. in Pounds	Ver- tical Hitch	Chok- er Hitch	Angle of Rope to Vertical				60°	
				0°	30°	45°	60°		
1/2	8.0	635	320	1,270	1,100	900	635		
9/16	10.2	790	395	1,580	1,370	1,120	790		
5/8	13.0	990	495	1,980	1,710	1,400	990		
3/4	17.5	1,240	620	2,480	2,150	1,750	1,240		
13/16	21.0	1,540	770	3,080	2,670	2,180	1,540		
7/8	25.0	1,780	890	3,560	3,080	2,520	1,780		
1"	30.5	2,180	1,090	4,360	3,780	3,080	2,180		
1 1/16	34.5	2,530	1,270	5,060	4,380	3,580	2,530		
1 1/8	40.0	2,920	1,460	5,840	5,060	4,130	2,920		
1 1/4	46.3	3,290	1,650	6,580	5,700	4,650	3,290		
1 5/16	52.5	3,710	1,860	7,420	6,430	5,250	3,710		
1 1/2	66.8	4,630	2,320	9,260	8,020	6,550	4,630		
1 5/8	82.0	5,640	2,820	11,300	9,770	7,980	5,640		
1 3/4	98.0	6,710	3,360	13,400	11,600	9,490	6,710		
2"	118.0	7,920	3,960	15,800	13,700	11,200	7,920		
2 1/8	135.0	9,110	4,460	18,200	15,800	12,900	9,110		
2 1/4	157.0	10,600	5,300	21,200	18,400	15,000	10,600		
2 1/2	181.0	12,100	6,050	24,200	21,000	17,100	12,100		
2 5/8	205.0	13,600	6,800	27,200	23,600	19,200	13,600		

See Figures D-4 & D-5 for sling configuration description.

TABLE D-18: Part 2—Endless Sling

ENDLESS SLING							
Rope Dia-Meter		Nominal Weight per 100 ft. in in Pounds		BASKET HITCH			
				Angle of Rope to Horizontal			
Nominal in Inches	100 ft. in Pounds	Ver-tical Hitch	Chok-er Hitch	90°	60°	45°	30°
				Angle of Rope to Vertical			
				0°	30°	45°	60°
1/2	8.0	1,140	570	2,290	1,980	1,620	1,140
9/16	10.2	1,420	710	2,840	2,460	2,010	1,420
5/8	13.0	1,780	890	3,570	3,090	2,520	1,780
3/4	17.5	2,230	1,120	4,470	3,870	3,160	2,230
13/16	21.0	2,770	1,390	5,540	4,800	3,920	2,770
7/8	25.0	3,200	1,600	6,410	5,550	4,530	3,200
1"	30.5	3,920	1,960	7,850	6,800	5,550	3,920
1 1/16	34.5	4,550	2,280	9,110	7,990	6,440	4,550
1 1/8	40.0	5,260	2,630	10,500	9,100	7,440	5,260
1 1/4	46.3	5,920	2,960	11,800	10,300	8,380	5,920
1 5/16	52.5	6,680	3,340	13,400	11,600	9,450	6,680
1 1/2	66.8	8,330	4,170	16,700	14,400	11,800	8,330
1 5/8	82.0	10,200	5,080	20,300	17,600	14,400	10,200
1 3/4	98.0	12,100	6,040	24,200	20,900	17,100	12,100
2"	118.0	14,300	7,130	28,500	24,700	20,200	14,300
2 1/8	135.0	16,400	8,200	32,800	28,400	23,200	16,400
2 1/4	157.0	19,100	9,540	38,200	33,100	27,000	19,100
2 1/2	181.0	21,800	10,900	43,600	37,700	30,800	21,800
2 5/8	205.0	24,500	12,200	49,000	42,400	34,600	24,500

See Figures D-4 & D-5 for sling configuration description.

TABLE D-19

POLYPROPYLENE ROPE SLINGS

TABLE D-19: Part 1—Eye and Eye Sling

EYE & EYE SLING							
Rope Dia-Meter		Nominal Weight per 100 ft. in in Pounds		BASKET HITCH			
				Angle of Rope to Horizontal			
Nominal in Inches	100 ft. in Pounds	Ver-tical Hitch	Chok-er Hitch	90°	60°	45°	30°
				Angle of Rope to Vertical			
				0°	30°	45°	60°
1/2	4.7	645	325	1,290	1,120	910	645
9/16	6.1	780	390	1,560	1,350	1,100	780
5/8	7.5	950	475	1,900	1,650	1,340	950
3/4	10.7	1,300	650	2,600	2,250	1,840	1,300
13/16	12.7	1,520	760	3,040	2,630	2,150	1,520
7/8	15.0	1,760	880	3,520	3,050	2,490	1,760
1"	18.0	2,140	1,070	4,280	3,700	3,030	2,140
1 1/16	20.4	2,450	1,230	4,900	4,240	3,460	2,450
1 1/8	23.7	2,800	1,400	5,600	4,850	3,960	2,800

TABLE D-19: Part 1—Eye and Eye Sling

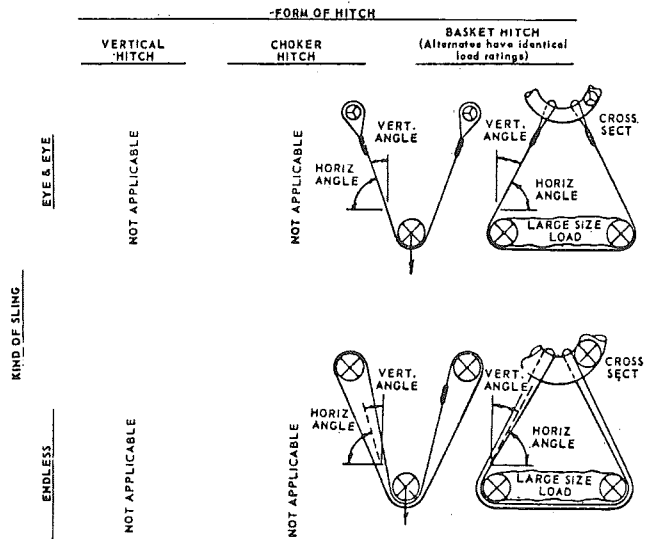
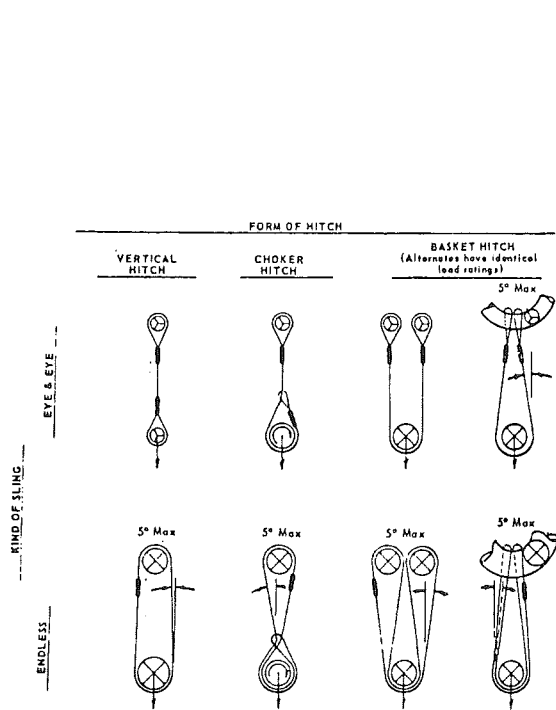
EYE & EYE SLING							
Rope Dia-Meter		Nominal Weight per 100 ft. in in Pounds		BASKET HITCH			
				Angle of Rope to Horizontal			
Nominal in Inches	100 ft. in Pounds	Ver-tical Hitch	Chok-er Hitch	90°	60°	45°	30°
				Angle of Rope to Vertical			
				0°	30°	45°	60°
1 1/4	27.0	3,210	1,610	6,420	5,560	4,540	3,210
1 5/16	30.5	3,600	1,800	7,200	6,240	5,090	3,600
1 1/2	38.5	4,540	2,270	9,080	7,860	6,420	4,540
1 5/8	47.5	5,510	2,760	11,000	9,540	7,790	5,510
1 3/4	57.0	6,580	3,290	13,200	11,400	9,300	6,580
2"	69.0	7,960	3,980	15,900	13,800	11,300	7,960
2 1/8	80.0	9,330	4,670	18,700	16,200	13,200	9,330
2 1/4	92.0	10,600	5,300	21,200	18,400	15,000	10,600
2 1/2	107.0	12,200	6,100	24,400	21,100	17,300	12,200
2 5/8	120.0	13,800	6,900	27,600	23,900	19,600	13,800

See Figures D-4 & D-5 for sling configuration description.

TABLE D-19: Part 2—Endless Sling

ENDLESS SLING							
Rope Dia-Meter		Nominal Weight per 100 ft. in in Pounds		BASKET HITCH			
				Angle of Rope to Horizontal			
Nominal in Inches	100 ft. in Pounds	Ver-tical Hitch	Chok-er Hitch	90°	60°	45°	30°
				Angle of Rope to Vertical			
				0°	30°	45°	60°
1/2	4.7	1,160	580	2,320	2,010	1,640	1,160
9/16	6.1	1,400	700	2,810	2,430	1,990	1,400
5/8	7.5	1,710	855	3,420	2,960	2,420	1,710
3/4	10.7	2,340	1,170	4,680	4,050	3,310	2,340
13/16	12.7	2,740	1,370	5,470	4,740	3,870	2,740
7/8	15.0	3,170	1,580	6,340	5,490	4,480	3,170
1"	18.0	3,850	1,930	7,700	6,670	5,450	3,860
1 1/16	20.4	4,410	2,210	8,820	7,640	6,240	4,410
1 1/8	23.7	5,040	2,520	10,100	8,730	7,130	5,040
1 1/4	27.0	5,780	2,890	11,600	10,000	8,170	5,780
1 5/16	30.5	6,480	3,240	13,000	11,200	9,170	6,480
1 1/2	38.5	8,170	4,090	16,300	14,200	11,600	8,170
1 5/8	47.5	9,920	4,960	19,800	17,200	14,000	9,920
1 3/4	57.0	11,800	5,920	23,700	20,500	16,800	11,800
2"	69.0	14,300	7,160	28,700	24,800	20,300	14,300
2 1/8	80.0	16,800	8,400	33,600	29,100	23,800	16,800
2 1/4	92.0	19,100	9,540	38,200	33,100	27,000	19,100
2 1/2	107.0	22,000	11,000	43,900	38,000	31,100	22,000
2 5/8	120.0	24,800	12,400	49,700	43,000	35,100	24,800

See Figures D-4 & D-5 for sling configuration description.



NOTES: For vertical angles of 5° or less, refer to Figure D-4 "Basic Sling Configuration with Vertical Legs".

See Figure D-4 for explanation of symbols.

FIGURE D-5

Sling Configurations with Angled Legs

NOTES: Angles of 5° or less from the vertical may be considered vertical angles.

For slings with legs more than 5° off vertical, the actual angle as shown in Figure D-5 must be considered.

EXPLANATION OF SYMBOLS: Minimum diameter of curvature

- Represents a contact surface which shall have a diameter of curvature at least double the diameter of the rope.
- Represents a contact surface which shall have a diameter of curvature at least 8 times the diameter of the rope.
- Represents a load in a choker hitch and illustrates the rotary force on the load and/or the slippage of the rope in contact with the load. Diameter of curvature of load surface shall be at least double the diameter of the rope.

FIGURE D-4

Basic Sling Configurations with Vertical Legs

TABLE D-20

RATED CAPACITY IN POUNDS SYNTHETIC WEB SLINGS 1,000 LBS. PER INCH OF WIDTH SINGLE PLY

[TABLE D-20: Part 1—Types I, II, III, & IV]

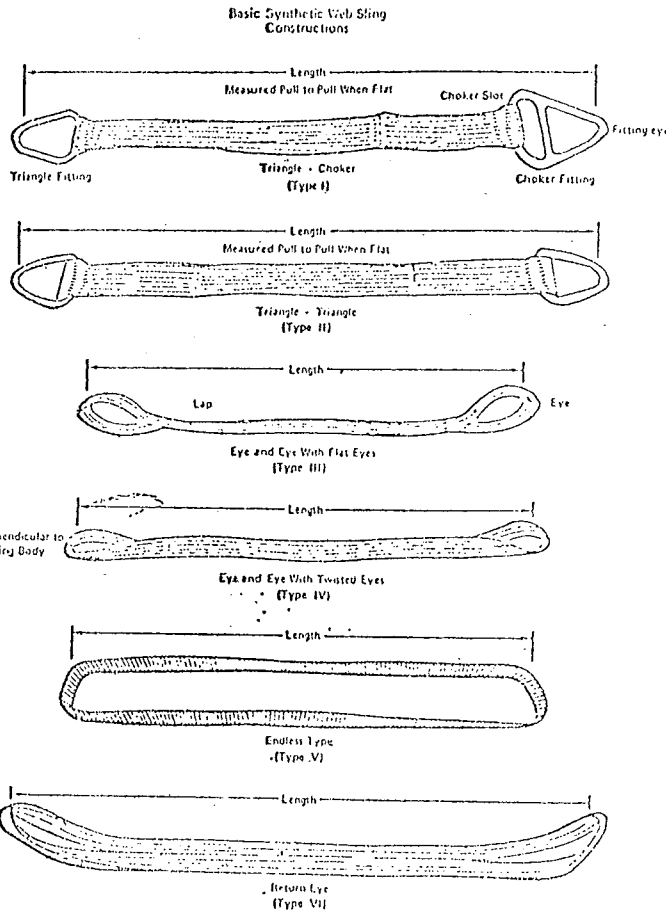


FIG. D-6

Basic Synthetic Web Slings Constructions

Sling Body Width, Inches	Triangle - Choker Slings, Type I Triangle - Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,000	750	2,000	1,700	1,400	1,000
2	2,000	1,500	4,000	3,500	2,800	2,000
3	3,000	2,200	6,000	5,200	4,200	3,000
4	4,000	3,000	8,000	6,900	5,700	4,000
5	5,000	3,700	10,000	8,700	7,100	5,000
6	6,000	4,500	12,000	10,400	8,500	6,000

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-20: Part 2—Type V]

Sling Body Width, Inches	Endless Slings, Type V					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,600	1,300	3,200	2,800	2,300	1,600
2	3,200	2,600	6,400	5,500	4,500	3,200
3	4,800	3,800	9,600	8,300	6,800	4,800
4	6,400	5,100	12,800	11,100	9,000	6,400
5	8,000	6,400	16,000	13,900	11,300	8,000
6	9,600	7,700	19,200	16,600	13,600	9,600

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-20: Part 3—Type VI]

Sling Body Width, Inches	Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	800	650	1,600	1,400	1,150	800
2	1,600	1,300	3,200	2,800	2,300	1,600
3	2,400	1,950	4,800	4,150	3,400	2,400
4	3,200	2,600	6,400	5,500	4,500	3,200
5	4,000	3,250	8,000	6,900	5,650	4,000
6	4,800	3,800	9,600	8,300	6,800	4,800

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

TABLE D-21

RATED CAPACITY IN POUNDS SYNTHETIC WEB SLINGS 1,200 LBS PER INCH OF WIDTH SINGLE PLY

[TABLE D-21: Part 1—Types I, II, III, & IV]

Sling Body Width, Inches	Triangle - Choker Slings, Type I Triangle - Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,200	900	2,400	2,100	1,700	1,200
2	2,400	1,800	4,800	4,200	3,400	2,400
3	3,600	2,700	7,200	6,200	5,100	3,600
4	4,800	3,600	9,600	8,300	6,800	4,800
5	6,000	4,500	12,000	10,400	8,500	6,000
6	7,200	5,400	14,400	12,500	10,200	7,200

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-21: Part 2—Type V]

Sling Body Width, Inches	Endless Slings, Type V					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,900	1,500	3,800	3,300	2,700	1,900
2	3,800	3,000	7,600	6,600	5,400	3,800
	5,800	4,600	11,600	10,000	8,200	5,800
4	7,700	6,200	15,400	13,300	10,900	7,700
5	9,600	7,700	19,200	16,600	13,600	9,600
6	11,500	9,200	23,000	19,900	16,300	11,500

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-21: Part 3—Type VI]

Sling Body Width, Inches	Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	950	750	1,900	1,650	1,350	950
2	1,900	1,500	3,800	3,300	2,700	1,900
3	2,850	2,250	5,700	4,950	4,050	2,850
4	3,800	3,000	7,600	6,600	5,400	3,800
5	4,750	3,750	9,500	8,250	6,750	4,750
6	5,800	4,600	11,600	10,000	8,200	5,800

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

TABLE D-22

RATED CAPACITY IN POUNDS SYNTHETIC WEB SLINGS 1,600 LBS PER INCH OF WIDTH SINGLE PLY

[TABLE D-22: Part 1—Types I, II, III, & IV]

Sling Body Width, Inches	Triangle - Choker Slings, Type I Triangle - Triangle Slings, Type II Eye & Eye with Flat Eye Slings, Type III Eye & Eye with Twisted Eye Slings, Type IV					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,600	1,200	3,200	2,800	2,300	1,600
2	3,200	2,400	6,400	5,500	4,500	3,200
3	4,800	3,600	9,600	8,300	6,800	4,800
4	6,400	4,800	12,800	11,100	9,000	6,400
5	8,000	6,000	16,000	13,800	11,300	8,000
6	9,600	7,200	19,200	16,600	13,600	9,600

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-22: Part 2—Type V]

Sling Body Width, Inches	Endless Slings, Type V					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	2,600	2,100	5,200	4,500	3,700	2,600
2	5,100	4,100	10,200	8,800	7,200	5,100
3	7,700	6,200	15,400	13,300	10,900	7,700
4	10,100	8,200	20,400	17,700	14,400	10,200
5	12,800	10,200	25,600	22,200	18,100	12,800
6	15,400	12,300	30,800	26,700	21,800	15,400

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[TABLE D-22: Part 3—Type VI]

Sling Body Width, Inches	Return Eye Slings, Type VI					
	Vert.	Choker	Vert. Basket	30° Basket	45° Basket	60° Basket
1	1,050	1,050	2,600	2,250	1,850	1,300
2	2,600	2,100	5,200	4,500	3,700	2,600
3	3,900	3,150	7,800	6,750	5,500	3,900
4	5,100	4,100	10,200	8,800	7,200	5,100
5	6,400	5,150	12,800	11,050	9,050	6,400
6	7,700	6,200	15,400	13,300	10,900	7,700

NOTES:

1. All angles shown are measured from the vertical.
2. Capacities for intermediate widths not shown may be obtained by interpolation.

[Order 76-6, § 296-24-29431, filed 3/1/76.]

Part E

HAZARDOUS MATERIALS, FLAMMABLE AND
COMBUSTIBLE LIQUIDS, SPRAY FINISHING, DIP
TANKS

WAC

- 296-24-295 Compressed gases (general requirements).
- 296-24-29501 Inspection of compressed gas cylinders.
- 296-24-29503 Compressed gases.
- 296-24-29505 Safety relief devices for compressed gas containers.
- 296-24-310 Acetylene.
- 296-24-31001 Cylinders.
- 296-24-31003 Piped systems.
- 296-24-31005 Generators and filling cylinders.
- 296-24-315 Hydrogen.
- 296-24-31501 General.
- 296-24-31503 Gaseous hydrogen systems.
- 296-24-31505 Liquefied hydrogen systems.
- 296-24-320 Oxygen.
- 296-24-32001 Scope.
- 296-24-32003 Bulk oxygen systems.
- 296-24-325 Nitrous oxide.
- 296-24-330 Flammable and combustible liquids.
- 296-24-33001 Definitions.
- 296-24-33003 Scope.
- 296-24-33005 Tank storage.
- 296-24-33007 Piping, valves, and fittings.
- 296-24-33009 Container and portable tank storage.
- 296-24-33011 Industrial plants.
- 296-24-33013 Bulk plants.
- 296-24-33015 Service stations.
- 296-24-33017 Processing plants.
- 296-24-33019 Refineries, chemical plants, and distilleries.
- 296-24-370 Spray finishing using flammable and combustible materials.
- 296-24-37001 Definitions.
- 296-24-37003 Spray booths.
- 296-24-37005 Electrical and other sources of ignition.
- 296-24-37007 Ventilation.
- 296-24-37009 Flammable and combustible liquids—Storage and handling.
- 296-24-37011 Protection.
- 296-24-37013 Operations and maintenance.
- 296-24-37015 Fixed electrostatic apparatus.
- 296-24-37017 Electrostatic hand spraying equipment.
- 296-24-37019 Drying, curing, or fusion apparatus.
- 296-24-37021 Automobile undercoating in garages.
- 296-24-37023 Powder coating.
- 296-24-37025 Organic peroxides and dual component coatings.
- 296-24-37027 Scope.
- 296-24-405 Dip tanks containing flammable or combustible liquids.
- 296-24-40501 Definitions.
- 296-24-40503 Ventilation.
- 296-24-40505 Construction of dip tanks.
- 296-24-40507 Liquids used in dip tanks, storage and handling.
- 296-24-40509 Electrical and other sources of ignition.
- 296-24-40511 Operations and maintenance.
- 296-24-40513 Extinguishment.
- 296-24-40515 Special dip tank applications.
- 296-24-450 Chlorine cylinders used in chlorinator systems.

WAC 296-24-295 Compressed gases (general requirements). [Order 73-5, § 296-24-295, filed 5/9/73 and Order 73-4, § 296-24-295, filed 5/7/73.]

WAC 296-24-29501 Inspection of compressed gas cylinders. Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual inspection. Visual and other inspections shall be conducted as prescribed in the Hazardous Materials Regulations of the Department of Transportation (49 CFR

Parts 171-179 and 14 CFR Part 103). Where those regulations are not applicable, visual and other inspections shall be conducted in accordance with Compressed Gas Association Pamphlets C-6-1968 and C-8-1962. [Order 73-5, § 296-24-29501, filed 5/9/73 and Order 73-4, § 296-24-29501, filed 5/7/73.]

WAC 296-24-29503 Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tankcars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965. [Order 73-5, § 296-24-29503, filed 5/9/73 and Order 73-4, § 296-24-29503, filed 5/7/73.]

WAC 296-24-29505 Safety relief devices for compressed gas containers. Compressed gas cylinders, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association Pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963. [Order 73-5, § 296-24-29505, filed 5/9/73 and Order 73-4, § 296-24-29505, filed 5/7/73.]

WAC 296-24-310 Acetylene. [Order 73-5, § 296-24-310, filed 5/9/73 and Order 73-4, § 296-24-310, filed 5/7/73.]

WAC 296-24-31001 Cylinders. The in-plant transfer, handling, storage, and utilization of acetylene in cylinders shall be in accordance with Compressed Gas Association Pamphlet G-1-1966. [Order 73-5, § 296-24-31001, filed 5/9/73 and Order 73-4, § 296-24-31001, filed 5/7/73.]

WAC 296-24-31003 Piped systems. The piped systems for the in-plant transfer and distribution of acetylene shall be designed, installed, maintained, and operated in accordance with Compressed Gas Association Pamphlet G-1.3-1959. [Order 73-5, § 296-24-31003, filed 5/9/73 and Order 73-4, § 296-24-31003, filed 5/7/73.]

WAC 296-24-31005 Generators and filling cylinders. Plants for the generation of acetylene and the charging (filling) of acetylene cylinders shall be designed, constructed, and tested in accordance with the standards prescribed in Compressed Gas Association Pamphlet G-1.4-1966. [Order 73-5, § 296-24-31005, filed 5/9/73 and Order 73-4, § 296-24-31005, filed 5/7/73.]

WAC 296-24-315 Hydrogen. [Order 73-5, § 296-24-315, filed 5/9/73 and Order 73-4, § 296-24-315, filed 5/7/73.]

WAC 296-24-31501 General. (1) Definitions as Used in This Section. (a) Gaseous Hydrogen system is one in which the hydrogen is delivered, stored and discharged in the gaseous form to consumer's piping. The system includes stationary or movable containers, pressure regulators, safety relief devices, manifolds, interconnecting piping and controls. The system terminates at

the point where hydrogen at service pressure first enters the consumer's distribution piping.

(b) Approved—Means unless otherwise indicated listed or approved by the following nationally recognized testing laboratories: Underwriters Laboratories, Inc., and Factory Mutual Engineering Corp.

(c) Listed—See "approved".

(d) ASME—American Society of Mechanical Engineers.

(e) DOT specifications—Regulations of the Department of Transportation published in 49 CFR Chapter I.

(f) DOT regulations—See WAC 296-24-315.

(2) Scope. (a) Gaseous hydrogen systems. (i) WAC 296-24-31503 applies to the installation of gaseous hydrogen systems on consumer premises where the hydrogen supply to the consumer premises originates outside the consumer premises and is delivered by mobile equipment.

(ii) Wac 296-24-31503 does not apply to gaseous hydrogen systems having a total hydrogen content of less than 400 cubic feet, nor to hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or his agent for the purpose of storing hydrogen and refilling portable containers, trailers, mobile supply trucks, or tank cars.

(b) Liquefied hydrogen systems. (i) WAC 296-24-31505 applies to the installation of liquefied hydrogen systems on consumer premises.

(ii) WAC 296-24-31505 does not apply to liquefied hydrogen portable containers of less than 150 liters (39.63 gallons) capacity; nor to liquefied hydrogen manufacturing plants or other establishments operated by the hydrogen supplier or his agent for the sole purpose of storing liquefied hydrogen and refilling portable containers, trailers, mobile supply trucks or tank cars [Order 73-5, § 296-24-31501, filed 5/9/73 and Order 73-4, § 296-24-31501, filed 5/7/73.]

WAC 296-24-31503 Gaseous hydrogen systems. (1) Design. (a) Containers. (i) Hydrogen containers shall comply with one of the following:

(A) Designed, constructed, and tested in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels—1968.

(B) Designed, constructed, tested and maintained in accordance with U.S. Department of Transportation Specifications and Regulations.

(ii) Permanently installed containers shall be provided with substantial noncombustible supports on firm noncombustible foundations.

(iii) Each portable container shall be legibly marked with the name "Hydrogen" in accordance with "Marking Compressed Gas Containers to Identify the Material Contained" ANSI Z48.1-1954. Each manifolded hydrogen supply unit shall be legibly marked with the name Hydrogen or a legend such as "This unit contains hydrogen."

(b) Safety relief devices. (i) Hydrogen containers shall be equipped with safety relief devices as required by the ASME Boiler and Pressure Vessel Code, Section VIII

Unfired Pressure Vessels, 1968 or the DOT Specifications and Regulations under which the container is fabricated.

(ii) Safety relief devices shall be arranged to discharge upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container, adjacent structure of personnel. This requirement does not apply to DOT Specification containers having an internal volume of 2 cubic feet or less.

(iii) Safety relief devices or vent piping shall be designed or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

(c) Piping, tubing, and fittings. (i) Piping, tubing, and fittings shall be suitable for hydrogen service and for the pressures and temperatures involved. Case iron pipe and fittings shall not be used.

(ii) Piping and tubing shall conform to Section 2—"Industrial Gas and Air Piping"—Code for Pressure Piping, ANSI B31.1-1967 with addenda B31.1-1969.

(iii) Joints in piping and tubing may be made by welding or brazing or by use of flanged, threaded, socket, or compression fittings. Gaskets and thread sealants shall be suitable for hydrogen service.

(d) Equipment assembly. (i) Valves, gauges, regulators, and other accessories shall be suitable for hydrogen service.

(ii) Installation of hydrogen systems shall be supervised by personnel familiar with proper practices with reference to their construction and use.

(iii) Storage containers, piping, valves, regulating equipment, and other accessories shall be readily accessible, and shall be protected against physical damage and against tampering.

(iv) Cabinets or housings containing hydrogen control or operating equipment shall be adequately ventilated.

(v) Each mobile hydrogen supply unit used as part of a hydrogen system shall be adequately secured to prevent movement.

(vi) Mobile hydrogen supply units shall be electrically bonded to the system before discharging hydrogen.

(e) Marking. The hydrogen storage location shall be permanently placarded as follows: "HYDROGEN—FLAMMABLE GAS—NO SMOKING—NO OPEN FLAMES," or equivalent.

(f) Testing. After installations, all piping, tubing, and fittings shall be tested and proved hydrogen gas tight at maximum operating pressure.

(2) Location. (a) General. (i) The system shall be located so that it is readily accessible to delivery equipment and to authorized personnel.

(ii) Systems shall be located above ground.

(iii) Systems shall not be located beneath electric power lines.

(iv) Systems shall not be located close to flammable liquid piping or piping of other flammable gases.

(v) Systems near aboveground flammable liquid storage shall be located on ground higher than the flammable liquid storage except when dikes, diversion curbs, grading, or separating solid walls are used to prevent accumulation of flammable liquids under the system.

(b) Specific requirements. (i) The location of a system, as determined by the maximum total contained volume of hydrogen, shall be in the order of preference as indicated by Roman numerals in Table H-1.

TABLE H-1

Nature of location	Size of hydrogen system		
	Less than 3,000 CF	3,000 CF to 15,000 CF	In excess of 15,000 CF
Outdoors	I	I	I
In a separate building	II	II	II
In a special room	III	III	Not permitted.
Inside buildings not in a special room and exposed to other occupancies	IV	Not permitted.	Not permitted.

(ii) The minimum distance in feet from a hydrogen system of indicated capacity located outdoors, in separate buildings or in special rooms to any specified outdoor exposure shall be in accordance with Table H-2.

(iii) The distances in Table H-2 Items 1, 14, and 3 to 10 inclusive do not apply where protective structures such as adequate fire walls are located between the system and the exposure.

(iv) Hydrogen systems of less than 3,000 CF when located inside buildings and exposed to other occupancies shall be situated in the building so that the system will be as follows:

(A) In an adequately ventilated area as in (3)(b)(ii) of this section.

(B) Twenty feet from stored flammable materials or oxidizing gases.

(C) Twenty-five feet from open flames, ordinary electrical equipment or other sources of ignition.

(D) Twenty-five feet from concentrations of people.

(E) Fifty feet from intakes of ventilation or air-conditioning equipment and air compressors.

(F) Fifty feet from other flammable gas storage.

(G) Protected against damage or injury due to falling objects or working activity in the area.

(H) More than one system of 3,000 CF or less may be installed in the same room, provided the systems are separated by at least 50 feet. Each such system shall meet all of the requirements of this section.

(3) Design Consideration at Specific Locations. (a) Outdoor locations. (i) Where protective walls or roofs are provided, they shall be constructed of noncombustible materials.

(ii) Where the enclosing sides adjoin each other, the area shall be properly ventilated.

(iii) Electrical equipment within 15 feet shall be in accordance with WAC 296-24-950 and WAC 296-24-955.

(b) Separate buildings. (i) Separate buildings shall be built of at least noncombustible construction. Windows and doors shall be located so as to be readily accessible in case of emergency. Windows shall be of glass or plastic in metal frames.

(ii) Adequate ventilation to the outdoors shall be provided. Inlet openings shall be located near the floor in exterior walls only. Outlet openings shall be located at the high point of the room in exterior walls or roof. Inlet and outlet openings shall each have minimum total area of one (1) square foot per 1,000 cubic feet of room volume. Discharge from outlet openings shall be directed or conducted to a safe location.

(iii) Explosion venting shall be provided in exterior walls or roof only. The venting area shall be equal to not less than 1 square foot per 30 cubic feet of room volume and may consist of any one or any combination of the following: walls of light noncombustible material, preferably single thickness, single strength glass; lightly fastened hatch covers; lightly fastened swinging doors in exterior walls opening outward; lightly fastened walls or roof designed to relieve at a maximum pressure of 25 pounds per square foot.

(iv) There shall be no sources of ignition from open flames, electrical equipment, or heating equipment.

(v) Electrical equipment shall be in accordance with WAC 296-24-950 and 296-24-955 for Class I, Division 2 locations.

(vi) Heating, if provided, shall be by steam, hot water, or other indirect means.

(c) Special rooms. (i) Floor, walls, and ceiling shall have a fire-resistance rating of at least 2 hours. Walls or partitions shall be continuous from floor to ceiling and shall be securely anchored. At least one wall shall be an exterior wall. Openings to other parts of the building shall not be permitted. Windows and doors shall be in exterior walls and shall be located so as to be readily accessible in case of emergency. Windows shall be of glass or plastic in metal frames.

(ii) Ventilation shall be as provided in (3)(b)(ii) of this section.

(iii) Explosion venting shall be as provided in (3)(b)(iii) of this section.

(iv) There shall be no sources of ignition from open flames, electrical equipment or heating equipment.

(v) Electrical equipment shall be in accordance with Article 501 of the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968), for Class I Division 2 locations.

(vi) Heating, if provided, shall be by steam, hot water, or indirect means.

(4) Operating Instructions. For installations which require any operation of equipment by the user, legible instructions shall be maintained at operating locations.

(5) Maintenance. (a) The equipment and functioning of each charged gaseous hydrogen system shall be maintained in a safe operating condition in accordance with the requirements of this section. The area within 15 feet

of any hydrogen container shall be kept free of dry vegetation and combustible material.

TABLE H-2

Type of outdoor exposure		Size of hydrogen system		
		Less than 3,000 CF	3,000 CF to 15,000 CF	In excess of 15,000 CF
1. Building or structure	Wood frame construction*	10	25	50
	Heavy timber, non-combustible or ordinary construction*	0	10	**25
	Fire-resistant construction*	0	0	0
2. Wall openings	Not above any part of a system	10	10	10
	Above any part of a system	25	25	25
3. Flammable liquids above ground	0 to 1,000 gallons	10	25	25
	In excess of 1,000 gallons	25	50	50
4. Flammable liquids below ground—0 to 1,000 gallons	Tank	10	10	10
	Vent or fill opening of tank	25	25	25
5. Flammable liquids below ground—in excess of 1,000 gallons	Tank	20	20	20
	Vent or fill opening of tank	25	25	25
6. Flammable gas storage, either high pressure or low pressure.	0 to 15,000 CF capacity	10	25	25
	In excess of 15,000 CF capacity	25	50	50
	12,000 CF or less	Refer to NFPA No. 51, gas systems for welding and cutting (1969).		
7. Oxygen storage	More than 12,000 CF	Refer to NFPA No. 566, bulk oxygen systems at consumer sites (1969).		
	Fast burning solids such as ordinary lumber, excelsior or paper	50	50	25
9. Slow burning solids such as heavy timber or coal		25	25	25
	Open flames and other sources of ignition	25	25	50

TABLE H-2

Type of outdoor exposure	Size of hydrogen system		
	Less than 3,000 CF	3,000 CF to 15,000 CF	In excess of 15,000 CF
11. Air compressor intakes or inlets to ventilating or air-condition equipment	50	50	50
12. Concentration of people***	25	50	50
13. Public sidewalks	15	15	15
14. Line of adjoining property which may be built upon	5	5	5

*Refer to NFPA No. 220 standard types of building construction for definitions of various types of construction. (1969 Ed.)

**But not less than one-half the height of adjacent side wall of the structure.

***In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly.

[Order 76-6, § 296-24-31503, filed 3/1/76; Order 73-5, § 296-24-31503, filed 5/9/73 and Order 73-4, § 296-24-31503, filed 5/7/73.]

WAC 296-24-31505 Liquefied hydrogen systems.

(1) Design. (a) Containers. (i) Hydrogen containers shall comply with the following: Storage containers shall be designed, constructed, and tested in accordance with appropriate requirements of the ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels (1968) or applicable provisions of API Standard 620, Recommended Rules for Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Second Edition (June 1963) and Appendix R (April 1965).

(ii) Portable containers shall be designed, constructed and tested in accordance with DOT Specifications and Regulations.

(b) Supports. Permanently installed containers shall be provided with substantial noncombustible supports securely anchored on firm noncombustible foundations. Steel supports in excess of 18 inches in height shall be protected with a protective coating having a 2-hour fire-resistance rating.

(c) Marking. Each container shall be legibly marked to indicate "LIQUEFIED HYDROGEN—FLAMMABLE GAS".

(d) Safety relief devices. (i) Stationary liquefied hydrogen containers shall be equipped with safety relief devices sized in accordance with CGA Pamphlet S-1-1966, Part 3, Safety Relief Device Standards for Compressed Gas Storage Containers.

(A) Portable liquefied hydrogen containers complying with the U.S. Department of Transportation Regulations shall be equipped with safety relief devices as required in the U.S. Department of Transportation Specifications

and Regulations. Safety relief devices shall be sized in accordance with the requirements of CGA Pamphlet S-1-1966, Safety Relief Device Standards, Part 1, Compressed Gas Cylinders and Part 2, Cargo and Portable Tank Containers.

(ii) Safety relief devices shall be arranged to discharge unobstructed to the outdoors and in such a manner as to prevent impingement of escaping liquid or gas upon the container, adjacent structures or personnel. See (2)(a)(vi) of this section for venting of safety relief devices in special locations.

(iii) Safety relief devices or vent piping shall be designed or located so that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

(iv) Safety relief devices shall be provided in piping wherever liquefied hydrogen could be trapped between closures

(e) Piping, tubing, and fittings. (i) Piping, tubing, and fittings and gasket and thread sealants shall be suitable for hydrogen service at the pressures and temperatures involved. Consideration shall be given to the thermal expansion and contraction of piping systems when exposed to temperature fluctuations of ambient to liquefied hydrogen temperatures.

(ii) Gaseous hydrogen piping and tubing (above—20°F.) shall conform to the applicable sections of Pressure Piping Section 2—Industrial Gas and Air Piping, ANSI B31.1-1967 with addenda B31.1-1969. Design of liquefied hydrogen or cold (-20°F. or below) gas piping shall use Petroleum Refinery Piping ANSI B31.3-1966 or Refrigeration Piping ANSI B31.5-1966 with addenda B31.5a-1968 as a guide.

(iii) Joints in piping and tubing shall preferably be made by welding or brazing; flanged, threaded, socket, or suitable compression fittings may be used.

(iv) Means shall be provided to minimize exposure of personnel to piping operating at low temperatures and to prevent air condensate from contacting piping, structural members, and surfaces not suitable for cryogenic temperatures. Only those insulating materials which are rated nonburning in accordance with ASTM Procedures D1692-68 may be used. Other protective means may be used to protect personnel. The insulation shall be designed to have a vapor-tight seal in the outer covering to prevent the condensation of air and subsequent oxygen enrichment within the insulation. The insulation material and outside shield shall also be of adequate design to prevent attrition of the insulation due to normal operating conditions.

(v) Uninsulated piping and equipment which operate at liquefied-hydrogen temperature shall not be installed above asphalt surfaces or other combustible materials in order to prevent contact of liquid air with such materials. Drip pans may be installed under uninsulated piping and equipment to retain and vaporize condensed liquid air.

(f) Equipment assembly. (i) Valves, gauges, regulators, and other accessories shall be suitable for liquefied hydrogen service and for the pressures and temperatures involved.

(ii) Installation of liquefied hydrogen systems shall be supervised by personnel familiar with proper practices and with reference to their construction and use.

(iii) Storage containers, piping, valves, regulating equipment, and other accessories shall be readily accessible and shall be protected against physical damage and against tampering. A shutoff valve shall be located in liquid product withdrawal lines as close to the container as practical. On containers of over 2,000 gallons capacity, this shutoff valve shall be of the remote control type with no connections, flanges, or other appurtenances (other than a welded manual shutoff valve) allowed in the piping between the shutoff valve and its connection to the inner container.

(iv) Cabinets or housings containing hydrogen control equipment shall be ventilated to prevent any accumulation of hydrogen gas.

(g) Testing. (i) After installation, all field-erected piping shall be tested and proved hydrogen gas-tight at operating pressure and temperature.

(ii) Containers if out of service in excess of 1 year shall be inspected and tested as outlined in (1) of this section. The safety relief devices shall be checked to determine if they are operable and properly set.

(h) Liquefied hydrogen vaporizers. (i) The vaporizer shall be anchored and its connecting piping shall be sufficiently flexible to provide for the effect of expansion and contraction due to temperature changes.

(ii) The vaporizer and its piping shall be adequately protected on the hydrogen and heating media sections with safety relief devices.

(iii) Heat used in a liquefied hydrogen vaporizer shall be indirectly supplied utilizing media such as air, steam, water, or water solutions.

(iv) A low temperature shutoff switch shall be provided in the vaporizer discharge piping to prevent flow of liquefied hydrogen in the event of the loss of the heat source.

(i) Electrical systems. (i) Electrical wiring and equipment located within 3 feet of a point where connections are regularly made and disconnected, shall be in accordance with WAC 296-24-950 and WAC 296-24-955 for class I, group B, division 1 locations.

(ii) Except as provided in (1) of this section, electrical wiring, and equipment located within 25 feet of a point where connections are regularly made and disconnected or within 25 feet of a liquid hydrogen storage container, shall be in accordance with WAC 296-24-950 and WAC 296-24-955 for class I, group B, division 2 locations. When equipment approved for class I, group B atmospheres is not commercially available, the equipment may be:

(A) Purged or ventilated in accordance with NFPA No. 496-1967, Standard for Purged Enclosures for Electrical Equipment in Hazardous Locations,

(B) Intrinsically safe, or

(C) Approved for class I, group C atmospheres. This requirement does not apply to electrical equipment which is installed on mobile supply trucks or tank cars from which the storage container is filled.

(j) Bonding and grounding. The liquefied hydrogen container and associated piping shall be electrically bonded and grounded.

(2) Location of Liquefied Hydrogen Storage. (a) General requirements. (i) The storage containers shall be located so that they are readily accessible to mobile supply equipment at ground level and to authorized personnel.

(ii) The containers shall not be exposed by electric power lines, flammable liquid lines, flammable gas lines, or lines carrying oxidizing materials.

(iii) When locating liquefied hydrogen storage containers near above-ground flammable liquid storage or liquid oxygen storage, it is advisable to locate the liquefied hydrogen container on ground higher than flammable liquid storage or liquid oxygen storage.

(iv) Where it is necessary to locate the liquefied hydrogen container on ground that is level with or lower than adjacent flammable liquid storage or liquid oxygen storage, suitable protective means shall be taken (such as by diking, diversion, curbs, grading), with respect to the adjacent flammable liquid storage or liquid oxygen storage, to prevent accumulation of liquids within 50 feet of the liquefied hydrogen container.

(v) Storage sites shall be fenced and posted to prevent entrance by unauthorized personnel. Sites shall also be placarded as follows: "Liquefied Hydrogen—Flammable Gas—No Smoking—No Open Flames."

(vi) If liquefied hydrogen is located in (as specified in Table H-3) a separate building, in a special room, or inside buildings when not in a special room and exposed to other occupancies, containers shall have the safety relief devices vented unobstructed to the outdoors at a minimum elevation of 25 feet above grade to a safe location as required in (l)(d)(ii) of this section.

(b) Specific requirements. (i) The location of liquefied hydrogen storage, as determined by the maximum total quantity of liquefied hydrogen, shall be in the order of preference as indicated by Roman numerals in the following Table H-3.

TABLE H-3

MAXIMUM TOTAL QUANTITY OF LIQUEFIED HYDROGEN STORAGE PERMITTED

Nature of location	Size of hydrogen storage (capacity in gallons)			
	39.63 (150 liters) to 50	51 to 300	301 to 600	In excess of 600
Outdoors	I	I	I	I
In a separate building	II	II	II	Not permitted.
In a special room	III	III	Not permitted	Not permitted.

TABLE H-3

MAXIMUM TOTAL QUANTITY OF LIQUEFIED HYDROGEN STORAGE PERMITTED

Nature of location	Size of hydrogen storage (capacity in gallons)			
	39.63 (150 liters) to 50	51 to 300	301 to 600	In excess of 600
Inside buildings not in a special room and exposed to other occupancies.	IV	Not permitted	Not permitted	Not permitted.

NOTE: This table does not apply to the storage in dewars of the type generally used in laboratories for experimental purposes.

(ii) The minimum distance in feet from liquefied hydrogen systems of indicated storage capacity located outdoors, in a separate building, or in a special room to any specified exposure shall be in accordance with Table H-4.

TABLE H-4

MINIMUM DISTANCE (FEET) FROM LIQUEFIED HYDROGEN SYSTEMS TO EXPOSURE

Type of exposure	Liquefied hydrogen storage (capacity in gallons)		
	39.63 (150 liters) to 3,500	3,501 to 15,000	15,001 to 30,000
1. Fire-resistant building and fire walls*	5	5	5
2. Noncombustible building*	25	50	75
3. Other buildings*	50	75	100
4. Wall openings, air-compressor intakes, inlets for air-conditioning or ventilating equipment	75	75	75
5. Flammable liquids (above ground and vent or fill openings if below ground) (see 513 and 514)	50	75	100
6. Between stationary liquefied hydrogen containers	5	5	5
7. Flammable gas storage	50	75	100
8. Liquid oxygen storage and other oxidizers (see 513 and 514)	100	100	100
9. Combustible solids	50	75	100
10. Open flames, smoking, and welding	50	50	50

TABLE H-4

MINIMUM DISTANCE (FEET) FROM LIQUEFIED HYDROGEN SYSTEMS TO EXPOSURE

Type of exposure	Liquefied hydrogen storage (capacity in gallons)		
	39.63 (150 liters) to 3,500	3,501 to 15,000	15,001 to 30,000
11. Concentrations of people**	75	75	75
12. Public ways, railroads, and property lines	25	50	75

*Refer to standard types of building construction, NFPA No. 220-1969 for definitions of various types of construction.

**In congested areas such as offices, lunchrooms, locker rooms, time-clock areas, and places of public assembly.

NOTE 1: The distance in Nos. 2, 3, 5, 7, 9, and 12 in Table H-4 may be reduced where protective structures, such as fire-walls equal to height of top of the container, to safeguard the liquefied hydrogen storage system, are located between the liquefied hydrogen storage installation and the exposure.

NOTE 2: Where protective structures are provided, ventilation and confinement of product should be considered. The 5-foot distance in Nos. 1 and 6 facilitates maintenance and enhances ventilation.

(c) Handling of liquefied hydrogen inside buildings other than separate buildings and special rooms. Portable liquefied hydrogen containers of 50 gallons or less capacity as permitted in Table H-3 and in compliance with (2)(a)(vi) of this section when housed inside buildings not located in a special room and exposed to other occupancies shall comply with the following minimum requirements:

(i) Be located 20 feet from flammable liquids and readily combustible materials such as excelsior or paper.

(ii) Be located 25 feet from ordinary electrical equipment and other sources of ignition including process or analytical equipment.

(iii) Be located 25 feet from concentrations of people.

(iv) Be located 50 feet from intakes of ventilation and air-conditioning equipment or intakes of compressors.

(v) Be located 50 feet from storage of other flammable-gases or storage of oxidizing gases.

(vi) Containers shall be protected against damage or injury due to falling objects or work activity in the area.

(vii) Containers shall be firmly secured and stored in an upright position.

(viii) Welding or cutting operations, and smoking shall be prohibited while hydrogen is in the room.

(ix) The area shall be adequately ventilated. Safety relief devices on the containers shall be vented directly outdoors or to a suitable hood. See (1)(d)(ii) of this section and (2)(a)(vi) of this section.

(3) Design Considerations at Specific Locations. (a) Outdoor locations. (i) Outdoor location shall mean outside of any building or structure, and includes locations

under a weather shelter or canopy provided such locations are not enclosed by more than two walls set at right angles and are provided with vent-space between the walls and vented roof or canopy.

(ii) Roadways and yard surfaces located below liquefied hydrogen piping, from which liquid air may drop, shall be constructed of noncombustible materials.

(iii) If protective walls are provided, they shall be constructed of noncombustible materials and in accordance with the provisions of (3)(a)(i) of this section as applicable.

(iv) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section.

(v) Adequate lighting shall be provided for nighttime transfer operation.

(b) Separate buildings. (i) Separate buildings shall be of light noncombustible construction on a substantial frame. Walls and roofs shall be lightly fastened and designed to relieve at a maximum internal pressure of 25 pounds per square foot. Windows shall be of shatterproof glass or plastic in metal frames. Doors shall be located in such a manner that they will be readily accessible to personnel in an emergency.

(ii) Adequate ventilation to the outdoors shall be provided. Inlet openings shall be located near the floor level in exterior walls only. Outlet openings shall be located at the high point of the room in exterior walls or roof. Both the inlet and outlet vent openings shall have a minimum total area of 1 square foot per 1,000 cubic feet of room volume. Discharge from outlet openings shall be directed or conducted to a safe location.

(iii) There shall be no sources of ignition.

(iv) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section except that the provisions of (1)(i)(ii) of this section shall apply to all electrical wiring and equipment in the separate building.

(v) Heating, if provided, shall be by steam, hot water, or other indirect means.

(c) Special rooms. (i) Floors, walls, and ceilings shall have a fire resistance rating of at least 2 hours. Walls or partitions shall be continuous from floor to ceiling and shall be securely anchored. At least one wall shall be an exterior wall. Openings to other parts of the building shall not be permitted. Windows and doors shall be in exterior walls and doors shall be located in such a manner that they will be accessible in an emergency. Windows shall be of shatterproof glass or plastic in metal frames.

(ii) Ventilation shall be as provided in (3)(b)(ii) of this section.

(iii) Explosion venting shall be provided in exterior walls or roof only. The venting area shall be equal to not less than 1 square foot per 30 cubic feet of room volume and may consist of any one or any combination of the following: walls of light noncombustible material; lightly fastened hatch covers; lightly fastened swinging doors opening outward in exterior walls; lightly fastened walls or roofs designed to relieve at a maximum pressure of 25 pounds per square foot.

(iv) There shall be no sources of ignition.

(v) Electrical wiring and equipment shall comply with (1)(i)(i) and (ii) of this section except that the provisions

of (l)(i)(ii) of this section shall apply to all electrical wiring and equipment in the special room.

(vi) Heating, if provided, shall be steam, hot water, or by other indirect means.

(4) Operating Instructions. (a) Written instructions. For installation which require any operation of equipment by the user, legible instructions shall be maintained at operating locations.

(b) Attendant. A qualified person shall be in attendance at all times while the mobile hydrogen supply unit is being unloaded.

(c) Security. Each mobile liquefied hydrogen supply unit used as part of a hydrogen system shall be adequately secured to prevent movement.

(d) Grounding. The mobile liquefied hydrogen supply unit shall be grounded for static electricity.

(5) Maintenance. (a) The equipment and functioning of each charged liquefied hydrogen system shall be maintained in a safe operating condition in accordance with the requirements of this section. Weeds or similar combustibles shall not be permitted within 25 feet of any liquified hydrogen equipment. [Order 76-6, § 296-24-31505, filed 3/1/76; Order 73-5, § 296-24-31505, filed 5/9/73 and Order 73-4, § 296-24-31505, filed 5/7/73.]

WAC 296-24-320 Oxygen. [Order 73-5, § 296-24-320, filed 5/9/73 and Order 73-4, § 296-24-320, filed 5/7/73.]

WAC 296-24-32001 Scope. This section applies to the installation of bulk oxygen systems on industrial and institutional consumer premises. This section does not apply to oxygen manufacturing plants or other establishments operated by the oxygen supplier or his agent for the purpose of storing oxygen and refilling portable containers, trailers, mobile supply trucks, or tank cars, nor to systems having capacities less than those stated in WAC 296-24-32003(1). [Order 73-5, § 296-24-32001, filed 5/9/73 and Order 73-4, § 296-24-32001, filed 5/7/73.]

WAC 296-24-32003 Bulk oxygen systems. (1) Definitions. As used in this section: A bulk oxygen system is an assembly of equipment, such as oxygen storage containers, pressure regulators, safety devices, vaporizers, manifolds, and interconnecting piping, which has storage capacity of more than 13,000 cubic feet of oxygen, Normal Temperature and Pressure (NTP), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (NTP) including unconnected reserves on hand at the cite. The bulk oxygen system terminates at the point where oxygen at service pressure first enters the supply line. The oxygen containers may be stationary or movable, and the oxygen may be stored as gas or liquid.

(2) Location. (a) General. Bulk oxygen storage systems shall be located above ground out of doors, or shall be installed in a building of noncombustible construction, adequately vented, and used for that purpose exclusively. The location selected shall be such that

containers and associated equipment shall not be exposed by electric power lines, flammable or combustible liquid lines, or flammable gas lines.

(b) Accessibility. The system shall be located so that it is readily accessible to mobile supply equipment at ground level and to authorized personnel.

(c) Leakage. Where oxygen is stored as a liquid, non-combustible surfacing shall be provided in an area in which any leakage of liquid oxygen might fall during operation of the system and filling of a storage container. For purposes of these standards, asphaltic or bituminous paving is considered to be combustible.

(d) Elevation. When locating bulk oxygen systems near above ground flammable or combustible liquid storage which may be either indoors or outdoors, it is advisable to locate the system on ground higher than the flammable or combustible liquid storage.

(e) Dikes. Where it is necessary to locate a bulk oxygen system on ground lower than adjacent flammable or combustible liquid storage suitable means shall be taken (such as by diking, diversion curbs, or grading) with respect to the adjacent flammable or combustible liquid storage to prevent accumulation of liquids under the bulk oxygen system.

(3) Distance Between Systems and Exposures. (a) General. The minimum distance from any bulk oxygen storage container to exposures, measured in the most direct line except as indicated in (3)(f) and (g) of this section shall be as indicated in (3)(b) to (r) of this section inclusive.

(b) Combustible structures. Fifty feet from any combustible structures.

(c) Fire resistive structures. Twenty-five feet from any structures with fire-resistive exterior walls or sprinklered buildings or other construction, but not less than one-half the height of adjacent side wall of the structure.

(d) Openings. At least 10 feet from any opening in adjacent walls of fire resistive structures. Spacing from such structures shall be adequate to permit maintenance, but shall not be less than 1 foot.

(e) Flammable liquid storage above ground.

Distance Capacity
(feet) (gallons)

50 _____ 0-1000
90 _____ 1001 or more

(f) Flammable liquid storage below ground.

Distance - measured horizontally from oxygen storage container to flammable liquid tank (feet)	Distance from oxygen storage container to filling and vent connections or openings to flammable liquid tank (feet)	Capacity gallons
15 _____	50 _____	0-1000
30 _____	50 _____	1001 or more

(g) Combustible liquid storage above ground.

Distance (feet)	Capacity (gallons)
25 _____	0-1000
50 _____	1001 or more

(h) Combustible liquid storage below ground.

Distance measured horizontally from oxygen storage container to combustible liquid tank (feet)	Distance from oxygen storage container to filling and vent connections or openings to combustible liquid tank (feet)
15 _____	40

(i) Flammable gas storage. (such as compressed flammable gases, liquefied flammable gases and flammable gases in low pressure gas holders):

Distance (feet)	Capacity (cu. ft. NTP)
50 _____	Less than 5000
90 _____	5000 or more

(j) Highly combustible materials. Fifty feet from solid materials which burn rapidly, such as excelsior or paper.

(k) Slow-burning materials. Twenty-five feet from solid materials which burn slowly, such as coal and heavy timber.

(l) Ventilation. Seventy-five feet in one direction and 35 feet in approximately 90° direction from confining walls (not including firewalls less than 20 feet high) to provide adequate ventilation in courtyards and similar confining areas.

(m) Congested areas. Twenty-five feet from congested areas such as offices, lunchrooms, locker rooms, time clock areas, and similar locations where people may congregate.

(n) Public areas. Fifty feet from places of public assembly.

(o) Patients. Fifty feet from areas occupied by non-ambulatory patients.

(p) Sidewalks. Ten feet from any public sidewalk.

(q) Adjacent property. Five feet from any line of adjoining property.

(r) Exceptions. The distances in (3)(b), (c), (e) to (k) inclusive, and (p) and (q) of this section do not apply where protective structures such as firewalls of adequate height to safeguard the oxygen storage systems are located between the bulk oxygen storage installation and the exposure. In such cases, the bulk oxygen storage installation may be a minimum distance of 1 foot from the firewall.

(4) Storage Containers. (a) Foundations and supports. Permanently installed containers shall be provided with substantial noncombustible supports on firm noncombustible foundations.

(b) Construction—liquid. Liquid oxygen storage containers shall be fabricated from materials meeting the impact test requirements of paragraph UG-84 of

ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels—1968. Containers operating at pressures above 15 pounds per square inch gage (p.s.i.g.) shall be designed, constructed, and tested in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, Section VII—Unfired Pressure Vessels—1968. Insulation surrounding the liquid oxygen container shall be noncombustible.

(c) Construction—gaseous. High-pressure gaseous oxygen containers shall comply with one of the following:

(i) Designed, constructed, and tested in accordance with appropriate requirements of ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels—1968.

(ii) Designed, constructed, tested, and maintained in accordance with DOT Specifications and Regulations.

(5) Piping, Tubing, and Fittings. (a) Selection. Piping, tubing, and fittings shall be suitable for oxygen service and for the pressures and temperatures involved.

(b) Specification. Piping and tubing shall conform to Section 2—Gas and Air Piping Systems of Code for Pressure Piping, ANSI, B31.1-1967 with addenda B31.10a-1969.

(c) Fabrication. Piping or tubing for operating temperatures below -20°F. shall be fabricated from materials meeting the impact test requirements of paragraph UG-84 of ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessels—1968, when tested at the minimum operating temperature to which the piping may be subjected in service.

(6) Safety Relief Devices. (a) General. Bulk oxygen storage containers, regardless of design pressure shall be equipped with safety relief devices as required by the ASME code or the DOT specifications and regulations.

(b) DOT containers. Bulk oxygen storage containers designed and constructed in accordance with DOT specification shall be equipped with safety relief devices as required thereby.

(c) ASME containers. Bulk oxygen storage containers designed and constructed in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII—Unfired Pressure Vessel—1968 shall be equipped with safety relief devices meeting the provisions of the Compressed Gas Association Pamphlet "Safety Relief Device Standards for Compressed Gas Storage Containers," S-1, Part 3.

(d) Insulation. Insulation casings on liquid oxygen containers shall be equipped with suitable safety relief devices.

(e) Reliability. All safety relief devices shall be so designed or located that moisture cannot collect and freeze in a manner which would interfere with proper operation of the device.

(7) Liquid Oxygen Vaporizers. (a) Mounts and couplings. The vaporizer shall be anchored and its connecting piping be sufficiently flexible to provide for the effect of expansion and contraction due to temperature changes.

(b) Relief devices. The vaporizer and its piping shall be adequately protected on the oxygen and heating medium sections with safety relief devices.

(c) Heating. Heat used in an oxygen vaporizer shall be indirectly supplied only through media such as steam, air, water, or water solutions which do not react with oxygen.

(d) Grounding. If electric heaters are used to provide the primary source of heat, the vaporizing system shall be electrically grounded.

(8) Equipment Assembly and Installation. (a) Cleaning. Equipment making up a bulk oxygen system shall be cleaned in order to remove oil, grease or other readily oxidizable materials before placing the system in service.

(b) Joints. Joints in piping and tubing may be made by welding or by use of flanged, threaded, slip, or compression fittings. Gaskets or thread sealants shall be suitable for oxygen service.

(c) Accessories. Valves, gages, regulators, and other accessories shall be suitable for oxygen service.

(d) Installation. Installation of bulk oxygen systems shall be supervised by personnel familiar with proper practices with reference to their construction and use.

(e) Testing. After installation all field erected piping shall be tested and proved gas tight at maximum operating pressure. Any medium used for testing shall be oil free and nonflammable.

(f) Security. Storage containers, piping, valves, regulating equipment, and other accessories shall be protected against physical damage and against tampering.

(g) Venting. Any enclosure containing oxygen control or operating equipment shall be adequately vented.

(h) Placarding. The bulk oxygen storage location shall be permanently placarded to indicate: "OXYGEN—NO SMOKING—NO OPEN FLAMES", or an equivalent warning.

(i) Electrical wiring. Bulk oxygen installations are not hazardous locations as defined and covered in WAC 296-24-950 and 296-24-955. Theretofore, general purpose or weatherproof types of electrical wiring and equipment are acceptable depending upon whether the installation is indoors or outdoors. Such equipment shall be installed in accordance with the applicable provisions of WAC 296-24-950 and WAC 296-24-955.

(9) Operating Instructions. For installations which require any operation of equipment by the user, legible instructions shall be maintained at operating locations.

(10) Maintenance. (a) The equipment and functioning of each charged bulk oxygen system shall be maintained in a safe operating condition in accordance with the requirements of this section. Wood and long dry grass shall be cut back within 15 feet of any bulk oxygen storage container. [Order 76-6, § 296-24-32003, filed 3/1/76; Order 73-5, § 296-24-32003, filed 5/9/73 and Order 73-4, § 296-24-32003, filed 5/7/73.]

WAC 296-24-325 Nitrous oxide. The piped systems for the in-plant transfer and distribution of nitrous oxide shall be designed, installed, maintained, and operated in accordance with Compressed Gas Association Pamphlet G8.1-1964. [Order 73-5, § 296-24-325, filed 5/9/73 and Order 73-4, § 296-24-325, filed 5/7/73.]

WAC 296-24-330 Flammable and combustible liquids. [Order 73-5, § 296-24-330, filed 5/9/73 and Order 73-4, § 296-24-330, filed 5/7/73.]

WAC 296-24-33001 Definitions. The following definitions are applicable to all sections of this chapter which include 296-24-330 in the section number. (1) Aerosol shall mean a material which is dispensed from its container as a mist, spray, or foam by a propellant under pressure.

(2) Atmospheric tank shall mean a storage tank which has been designed to operate at pressures from atmospheric through 0.5 p.s.i.g.

(3) Automotive service station shall mean that portion of property where flammable or combustible liquids used as motor fuels are stored and dispensed from fixed equipment into the fuel tanks of motor vehicles and shall include any facilities available for the sale and service of tires, batteries, and accessories, and for minor automotive maintenance work. Major automotive repairs, painting, body and fender work are excluded.

(4) Basement shall mean a story of a building or structure having one-half or more of its height below ground level and to which access for fire fighting purposes is unduly restricted.

(5) Boiling point shall mean the boiling point of a liquid at a pressure of 14.7 pounds per square inch absolute (p.s.i.a.) (760 mm.). Where an accurate boiling point is unavailable for the material in question, or for mixtures which do not have a constant boiling point, for purposes of this section the 10 percent point of a distillation performed in accordance with the Standard Method of Test for Distillation of Petroleum Products, ASTM D-86-62, may be used as the boiling point of the liquid.

(6) Boilover shall mean the expulsion of crude oil (or certain other liquids) from a burning tank. The light fractions of the crude oil burnoff producing a heat wave in the residue, which on reaching a water strata may result in the expulsion of a portion of the contents of the tank in the form of froth.

(7) Bulk plant shall mean that portion of a property where flammable or combustible liquids are received by tank vessel, pipelines, tank car, or tank vehicle, and are stored or blended in bulk for the purpose of distributing such liquids by tank vessel, pipeline, tank car, tank vehicle, or container.

(8) Chemical plant shall mean a large integrated plant or that portion of such a plant other than a refinery or distillery where flammable or combustible liquids are produced by chemical reactions or used in chemical reactions.

(9) Closed container shall mean a container as herein defined, so sealed by means of a lid or other device that neither liquid nor vapor will escape from it at ordinary temperatures.

(10) Crude petroleum shall mean hydrocarbon mixtures that have a flash point below 150°F. and which have not been processed in a refinery.

(11) Distillery shall mean a plant or that portion of a plant where flammable or combustible liquids produced

by fermentation are concentrated, and where the concentrated products may also be mixed, stored, or packaged.

(12) Fire area shall mean an area of a building separated from the remainder of the building by construction having a fire resistance of at least 1 hour and having all communicating openings properly protected by an assembly having a fire resistance rating of at least 1 hour.

(13) Fire resistance or fire resistive construction shall mean construction to resist the spread of fire.

(14) Flammable aerosol shall mean an aerosol which is required to be labeled "Flammable" under the Federal Hazardous Substances Labeling Act (15 U.S.C. 1261). For the purposes of WAC 296-24-33009, such aerosols are considered Class IA liquids.

(15) "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.

(c) For a liquid that is a mixture of compounds that have different volatilities and flashpoints, its flashpoint shall be determined by using the procedure specified in (20)(a) or (b) of this section on the liquid in the form it is shipped. If the flashpoint, as determined by this test, is 100°F. (37.8°C) or higher, an additional flashpoint determination shall be run on a sample of the liquid evaporated to 90 percent of its original volume, and the lower value of the two tests shall be considered the flashpoint of the material.

(d) Organic peroxides, which undergo autoaccelerating thermal decomposition, are excluded from any of the flashpoint determination methods specified in this section.

(16) Hotel shall mean buildings or groups of buildings under the same management in which there are sleeping accommodations for hire primarily used by transients who are lodged with or without meals including but not limited to inns, clubs, motels, and apartment hotels.

(17) Institutional occupancy shall mean the occupancy or use of a building or structure or any portion thereof by persons harbored or detained to receive medical, charitable or other care or treatment, or by persons involuntarily detained.

(18) Liquid shall mean, for the purpose of these standards, any material which has a fluidity greater than that of 300 penetration asphalt when tested in accordance with ASTM Test for Penetration for Bituminous

Materials, D-5-65. When not otherwise identified, the term liquid shall include both flammable and combustible liquids.

(19) "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.

(20) "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.).

(21) Unstable (reactive) liquid shall mean a liquid which in the pure state or as commercially produced or transported will vigorously polymerize, decompose, condense, or will become self-reactive under conditions of shocks, pressure, or temperature.

(22) Low-pressure tank shall mean a storage tank which has been designed to operate at pressures above 0.5 p.s.i.g. but not more than 15 p.s.i.g.

(23) Marine service station shall mean that portion of a property where flammable or combustible liquids used as fuels are stored and dispensed from fixed equipment on shore, piers, wharves, or floating docks into the fuel tanks or self-propelled craft, and shall include all facilities used in connection therewith.

(24) Mercantile occupancy shall mean the occupancy or use of a building or structure or any portion thereof

for the displaying, selling, or buying of goods, wares, or merchandise.

(25) Office occupancy shall mean the occupancy or use of a building or structure or any portion thereof for the transaction of business, or the rendering or receiving of professional services.

(26) Portable tank shall mean a closed container having a liquid capacity over 60 U.S. gallons and not intended for fixed installation.

(27) Pressure vessel shall mean a storage tank or vessel which has been designed to operate at pressures above 15 p.s.i.g.

(28) Protection for exposure shall mean adequate fire protection for structures on property adjacent to tanks, where there are employees of the establishment.

(29) Refinery shall mean a plant in which flammable or combustible liquids are produced on a commercial scale from crude petroleum, natural gasoline, or other hydrocarbon sources.

(30) Safety can shall mean an approved 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.

(31) Vapor pressure shall mean 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)", "American Society for Testing and Materials ASTM D323-68.

(32) Ventilation as specified in these standards is for the prevention of fire and explosion. It is considered adequate if it is sufficient to prevent accumulation of significant quantities of vapor-air mixtures in concentration over one-fourth of the lower flammable limit.

(33) Storage: Flammable or combustible liquids shall be stored in a tank or in a container that complies with WAC 296-24-33009(2).

(34) Barrel shall mean a volume of 42 U.S. gallons.

(35) Container shall mean any can, barrel, or drum.

(36) Approved unless otherwise indicated, approved, or listed by at least one of the following nationally recognized testing laboratories: Underwriters Laboratories, Inc.; Factory Mutual Engineering Corp.

(37) Listed see "approved" in WAC 296-24-33001(36).

(38) "SUS" means Saybolt Universal Seconds as determined by the Standard Method of Test for Saybolt Viscosity (ASTM D-88-56), and may be determined by use of the SUS conversion tables specified in ASTM Method D2161-66 following determination of viscosity in accordance with the procedures specified in the Standard Method of Test for Viscosity of Transparent and Opaque Liquids (ASTM D445-65).

(39) "Viscous" means a viscosity of 45 SUS or more.

NOTE: The volatility of liquids is increased when artificially heated to temperatures equal to or higher than their flashpoints. When so heated Class II and III liquids shall be subject to the applicable requirements for Class I or II liquids. These standards may also be applied to

high flashpoint liquids when so heated even though these same liquids when not heated are outside of its scope.

[Order 76-29, § 296-24-33001, filed 9/30/76; Order 76-6, § 296-24-33001, filed 3/1/76; Order 74-27, § 296-24-33001, filed 5/7/74; Order 73-5, § 296-24-33001, filed 5/9/73 and Order 73-4, § 296-24-33001, filed 5/7/73.]

WAC 296-24-33003 Scope. This section applies to the handling, storage, and use of flammable and combustible liquids with a flash point below 200°F. This section does not apply to:

(1) Bulk transportation of flammable and combustible liquids;

(2) Storage, handling, and use of fuel oil tanks and containers connected with oil burning equipment;

(3) Storage of flammable and combustible liquids on farms;

(4) Liquids without flashpoints that may be flammable under some conditions, such as certain halogenated hydrocarbons and mixtures containing halogenated hydrocarbons;

(5) Mists, sprays, or foams, except flammable aerosols covered in WAC 296-24-33009; or

(6) Installations made in accordance with requirements of the following standards:

(a) National Fire Protection Association Standard for Drycleaning Plants, NFPA No. 32-1970;

(b) National Fire Protection Association Standard for the Manufacture of Organic Coatings, NFPA No. 35-1970;

(c) National Fire Protection Association Standard for Solvent Extraction Plants, NFPA No. 36-1967; or

(d) National Fire Protection Association Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, NFPA No. 37-1970. [Order 73-5, § 296-24-33003, filed 5/9/73 and Order 73-4, § 296-24-33003, filed 5/7/73.]

WAC 296-24-33005 Tank storage. (1) Design and Construction of Tanks. (a) Materials. (i) Tanks shall be built of steel except as provided in (1)(a)(ii) through (v) of this section.

(ii) Tanks may be built of materials other than steel for installation underground or if required by the properties of the liquid stored. Tanks located above ground or inside buildings shall be of noncombustible construction.

(iii) Tanks built of materials other than steel shall be designed to specifications embodying principles recognized as good engineering design for the material used.

(iv) Unlined concrete tanks may be used for storing flammable or combustible liquids having a gravity of 40° API or heavier. Concrete tanks with special lining may be used for other services provided the design is in accordance with sound engineering practice.

(v) Tanks may have combustible or noncombustible linings.

(vi) Special engineering consideration shall be required if the specific gravity of the liquid to be stored exceeds that of water or if the tanks are designed to

contain flammable or combustible liquids at a liquid temperature below 0°F.

(b) Fabrication. (i) Tanks may be of any shape or type consistent with sound engineering design.

(ii) Metal tanks shall be welded, riveted, and caulked, brazed, or bolted, or constructed by use of a combination of these methods. Filler metal used in brazing shall be nonferrous metal or an alloy having a melting point above 1000°F. and below that of the metal joined.

(c) Atmospheric tanks. (i) Atmospheric tanks shall be built in accordance with acceptable good standards of design. Atmospheric tanks may be built in accordance with:

(A) Underwriters' Laboratories, Inc., Subjects No. 142, Standard for Steel Aboveground Tanks for Flammable and Combustible Liquids, 1968; No. 58, Standards for Steel Underground Tanks for Flammable and COMBUSTIBLE Liquids, Fifth Edition, December 1961; or No. 80, Standard for Steel Inside Tanks for Oil-Burner Fuel, September 1963.

(B) American Petroleum Institute Standards No. 12A, Specification for Oil Storage Tanks with Riveted Shells, Seventh Edition, September 1951, or No. 650, Welded Steel Tanks for Oil Storage, Third Edition, 1966.

(C) American Petroleum Institute Standards No. 12B, Specification for Bolted Production Tanks, Eleventh Edition, May 1958, and Supplement 1, March 1962; No. 12D, Specification for Large Welded Production Tanks, Seventh Edition, August 1957; or No. 12F, Specification for Small Welded Production Tanks, Fifth Edition, March 1961. Tanks built in accordance with these standards shall be used only as production tanks for storage of crude petroleum in oil-producing areas.

(ii) Tanks designed for underground service not exceeding 2,500 gallons capacity may be used aboveground.

(iii) Low-pressure tanks and pressure vessels may be used as atmospheric tanks.

(iv) Atmospheric tanks shall not be used for the storage of a flammable or combustible liquid at a temperature at or above its boiling point.

(d) Low pressure tanks. (i) The normal operating pressure of the tank shall not exceed the design pressure of the tank.

(ii) Low-pressure tanks shall be built in accordance with acceptable standards of design. Low-pressure tanks may be built in accordance with:

(A) American Petroleum Institute Standard No. 620, Recommended Rules for the Design and Construction of Large, Welded, Low-Pressure Storage Tanks, Third Edition, 1966.

(B) The principles of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessels Code, 1968.

(iii) Atmospheric tanks built according to the Underwriters' Laboratories, Inc., requirements in (1)(c)(i) of this section may be used for operating pressures not exceeding 1 p.s.i.g. and shall be limited to 2.5 p.s.i.g. under

emergency venting conditions. Pressure vessels may be used as low-pressure tanks.

(e) Pressure vessels. (i) The normal operating pressure of the vessel shall not exceed the design pressure of the vessel.

(ii) Pressure vessels shall be built in accordance with the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code, 1968.

(f) Provisions for internal corrosion. When tanks are not designed in accordance with the American Petroleum Institute, American Society of Mechanical Engineers, or the Underwriters' Laboratories, Inc.'s standards, or if corrosion is anticipated beyond that provided for in the design formulas used, additional metal thickness or suitable protective coatings or linings shall be provided to compensate for the corrosion loss expected during the design life of the tank.

(2) Installation of Outside Aboveground Tanks. (a) Location with respect to property lines and public ways.

(i) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable liquids, operating at pressures not in excess of 2.5 p.s.i.g. and equipped with emergency venting which will not permit pressures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-5.

(ii) Every aboveground tank for the storage of flammable or combustible liquids, except those liquids with boil-over characteristics and unstable flammable or combustible liquids, operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. shall be located in accordance with Table H-6.

TABLE H-5

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building and shall be not less than 5 feet.
Floating roof	Protection for exposures.	1/2 times diameter of tank but need not exceed 90 ft.	1/6 times diameter of tank but need not exceed 30 ft.
	None	Diameter of tank but need not exceed 175 ft.	1/6 times diameter of tank but need not exceed 30 ft.
Vertical with weak roof to shell seam.	Approved foam or inerting system on the tank.	1/2 times diameter of tank but need not exceed 90 ft. and shall not be less than 5 ft.	1/6 times diameter of tank but need not exceed 30ft.
	Protection for exposures.	Diameter of tank but, need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.

TABLE H-5

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building and shall be not less than 5 feet.
Horizontal and vertical, with emergency relief venting to limit pressures to 2.5 p.s.i.g.	Approved inerting system on the tank or approved foam system on vertical tanks.	1/2 times Table H-9 but shall not be less than 5 ft.	1/2 times Table H-9.
	Protection for exposures.	Table H-9	Table H-9
	None	2 times Table	Table H-9

TABLE H-6

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Any type	Protection for exposures.	1 1/2 times Table H-9 but shall not be less than 25 ft.	1 1/2 times Table H-9 but shall not be less than 25 ft.
	None	3 times Table H-9 but shall not be less than 50 ft.	1 1/2 times Table H-9 but shall not be less than 25 ft.

(iii) Every aboveground tank for the storage of flammable or combustible liquids with boil-over characteristics shall be located in accordance with Table H-7.

TABLE H-7

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Floating roof	Protection for exposures.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	None	2 times diameter of tank but need not exceed 350 ft.	1/3 times diameter of tank but need not exceed 60 ft.
Fixed roof	Approved foam or inerting system.	Diameter of tank but need not exceed 175 ft.	1/3 times diameter of tank but need not exceed 60 ft.
	Protection for exposures.	2 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.

TABLE H-7

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
	None	4 times diameter of tank but need not exceed 350 ft.	2/3 times diameter of tank but need not exceed 120 ft.

(iv) Every aboveground tank for the storage of unstable liquids shall be located in accordance with Table H-8.

TABLE H-8

Type of tank	Protection	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
Horizontal and vertical tanks with emergency relief venting to permit pressure not in excess of 2.5 p.s.i.g.	Tank protected with any of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	See Table H-9, but the distance may be not less than 25 ft.	Not less than 25 ft.
	Protection for exposures.	2 1/2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	None	5 times Table H-9 but not less than 100 ft.	Not less than 100 ft.
Horizontal and vertical tanks with emergency relief venting to permit pressure over 2.5 p.s.i.g.	Tank protected with any one of the following: Approved water spray, approved inerting, approved insulation and refrigeration, approved barricade.	2 times Table H-9 but not less than 50 ft.	Not less than 50 ft.
	Protection for exposures.	4 times Table H-9 but not less than 100 ft.	Not less than 100 ft.
	None	8 times Table H-9 but not less than 150 ft.	Not less than 150 ft.

(v) Reference minimum distances for use in Tables H-5 to H-8 inclusive.

TABLE H-9

Capacity tank gallons	Minimum distance in feet from property line which may be built upon, including the opposite side of a public way.	Minimum distance in feet from nearest side of any public way or from nearest important building.
275 or less	5	5
276 to 750	10	5
751 to 12,000	15	5
12,001 to 30,000	20	5
30,001 to 50,000	30	10
50,001 to 100,000	50	15
100,001 to 500,000	80	25
500,001 to 1,000,000	100	35
1,000,001 to 2,000,000	135	45
2,000,001 to 3,000,000	165	55
3,000,001 or more	175	60

(vi) Where end failure or horizontal pressure tanks and vessels may expose property, the tank shall be placed with the longitudinal axis parallel to the nearest important exposure.

(b) Spacing (shell-to-shell) between aboveground tanks. (i) The distance between any two flammable or combustible liquid storage tanks shall not be less than 3 feet.

(ii) Except as provided in (2)(b)(iii) of this section, the distance between any two adjacent tanks shall not be less than one-sixth the sum of their diameters. When the diameter of one tank is less than one-half the diameter of the adjacent tank, the distance between the two tanks shall not be less than one-half the diameter of the smaller tank.

(iii) Where crude petroleum in conjunction with production facilities are located in noncongested areas and have capacities not exceeding 126,000 gallons (3,000 barrels), the distance between such tanks shall not be less than 3 feet.

(iv) Where unstable flammable or combustible liquids are stored, the distance between such tanks shall not be less than one-half the sum of their diameters.

(v) When tanks are compacted in three or more rows or in an irregular pattern, greater spacing or other means shall be provided so that inside tanks are accessible for firefighting purposes.

(vi) The minimum separation between a liquefied petroleum gas container and a flammable or combustible liquid storage tank shall be 20 feet, except in the case of flammable or combustible liquid tanks operating at pressures exceeding 2.5 p.s.i.g. or equipped with emergency venting which will permit pressures to exceed 2.5 p.s.i.g. in which case the provisions of (2)(b)(i) and (ii) of this section shall apply. Suitable means shall be taken to prevent the accumulation of flammable or combustible liquids under adjacent liquefied petroleum gas containers such as by diversion curbs or grading. When flammable or combustible liquid storage tanks are within a diked area, the liquefied petroleum gas containers shall be outside the diked area and at least 10 feet away from the centerline of the wall of the diked area. The

foregoing provisions shall not apply when liquefied petroleum gas containers of 125 gallons or less capacity are installed adjacent to fuel oil supply tanks of 550 gallons or less capacity.

(c) Location of outside aboveground tanks with respect to important buildings on same property. Every outside aboveground tank shall be separated from important buildings on the same property by distances not less than those specified in (2)(a)(i), (ii), (iii) and (iv) of this section, whichever is applicable. The appropriate distance column in Tables H-5, H-6, H-7, H-8, or H-9, that shall be used shall be the one reading: "Minimum Distance in Feet from Nearest Side of Any Public Way or From Nearest Important Building."

(d) Normal venting for aboveground tanks. (i) Atmospheric storage tanks shall be adequately vented to prevent the development of vacuum or pressure sufficient to distort the roof of a cone roof tank or exceed the design pressure in the case of other atmospheric tanks, as a result of filling or emptying, and atmospheric temperature changes.

(ii) Normal vents shall be sized either in accordance with: (A) the American Petroleum Institute Standard 2000 (1968), Venting Atmospheric and Low-Pressure Storage Tanks; or (B), other accepted standard; or (C) shall be at least as large as the filling or withdrawal connection, whichever is larger but in no case less than 1 1/4 inch nominal inside diameter.

(iii) Low-pressure tanks and pressure vessels shall be adequately vented to prevent development of pressure or vacuum, as a result of filling or emptying and atmospheric temperature changes, from exceeding the design pressure of the tank or vessel. Protection shall also be provided to prevent over-pressure from any pump discharging into the tank or vessel when the pump discharge pressure can exceed the design pressure of the tank or vessel.

(iv) If any tank or pressure vessel has more than one fill or withdrawal connection and simultaneous filling or withdrawal can be made, the vent size shall be based on the maximum anticipated simultaneous flow.

(v) Unless the vent is designed to limit the internal pressure 2.5 p.s.i. or less, the outlet of vents and vent drains shall be arranged to discharge in such a manner as to prevent localized overheating of any part of the tank in the event vapors from such vents are ignited.

(vi) Tanks and pressure vessels storing Class IA liquids shall be equipped with venting devices which shall be normally closed except when venting to pressures or vacuum conditions. Tanks and pressure vessels storing Class IB and IC liquids shall be equipped with venting devices which shall be normally closed except when venting under pressure or vacuum conditions, or with approved flame arresters.

Exemption: Tanks of 3,000 bbls. capacity or less containing crude petroleum in crude-producing areas; and, outside aboveground atmospheric tanks under 1,000 gallons capacity containing other than Class IA flammable liquids may have open vents. (See (2)(f)(ii) of this section.)

(vii) Flame arresters or venting devices required in (2)(e)(vi) of this section may be omitted for Class IB and IC liquids where conditions are such that their use may, in case of obstruction, result in tank damage.

(e) Emergency relief venting for fire exposure for aboveground tanks. (i) Every aboveground storage tank shall have some form of construction or device that will relieve excessive internal pressure caused by exposure fires.

(ii) In a vertical tank the construction referred to in (2)(e)(i) of this section may take the form of a floating roof, lifter roof, a weak roof-to-shell seam, or other approved pressure relieving construction. The weak roof-to-shell seam shall be constructed to fail preferential to any other seam.

(iii) Where entire dependence for emergency relief is placed upon pressure relieving devices, the total venting capacity of both normal and emergency vents shall be enough to prevent rupture of the shell or bottom of the tank if vertical, or of the shell or heads if horizontal. If unstable liquids are stored, the effects of heat or gas resulting from polymerization, decomposition, condensation, or self-reactivity shall be taken into account. The total capacity of both normal and emergency venting devices shall be not less than that derived from Table H-10 except as provided in (2)(e)(v) and (vi) of this section. Such device may be a self-closing manhole cover, or one using long bolts that permit the cover to lift under internal pressure, or an additional or larger relief valve or valves. The wetted area of the tank shall be calculated on the basis of 55 percent of the total exposed area of a sphere or spheroid, 75 percent of the total exposed area of a horizontal tank and the first 30 feet above grade of the exposed shell area of a vertical tank.

TABLE 10
WETTED AREA VERSUS CUBIC FEET
FREE AIR PER HOUR
(14.7 psia and 60°F.)

Square feet	CFH	Square feet	CFH	Square feet	CFH
20	21,100	200	211,000	1,000	524,000
30	31,600	250	239,000	1,200	557,000
40	42,100	300	265,000	1,400	587,000
50	52,700	350	288,000	1,600	614,000
60	63,200	400	312,000	1,800	639,000
70	73,700	500	354,000	2,000	662,000
80	84,200	600	392,000	2,400	704,000
90	94,800	700	428,000	2,800	742,000
100	105,000	800	462,000	and	
120	126,000	900	493,000	over	
140	147,000	1,000	524,000		
160	168,000				
180	190,000				
200	211,000				

(iv) For tanks and storage vessels designed for pressure over 1 p.s.i.g., the total rate of venting shall be determined in accordance with Table H-10, except that when the exposed wetted area of the surface is greater

than 2,800 square feet, the total rate of venting shall be calculated by the following formula:

$$CFH = 1,107A \text{ (superscript 0.82)}$$

Where:

- CFH = Venting requirement, in cubic feet of free air per hour.
- A = Exposed wetted surface, in square feet.

NOTE: The foregoing formula is based on $Q = 21,000A \text{ (superscript 0.82)}$.

(v) The total emergency relief venting capacity for any specific stable liquid may be determined by the following formula:

$$\text{Cubic feet of free air per hour} = V$$

$$V = \frac{1337}{LM}$$

- V = Cubic feet of free air per hour from Table H-10.
- L = Latent heat of vaporization of specific liquid in B.t.u. per pound.
- M = Molecular weight of specific liquids.

(vi) The required airflow rate of (2)(e)(iii) or (v) of this section may be multiplied by the appropriate factor listed in the following schedule when protection is provided as indicated. Only one factor may be used for any one tank.

- 0.5 for drainage in accordance with (2)(g)(ii) of this section for tanks over 200 square feet of wetted area.
- 0.3 for approved water spray.
- 0.3 for approved insulation.
- 0.15 for approved water spray with approved insulation.

(vii) The outlet of all vents and vent drains on tanks equipped with emergency venting to permit pressures exceeding 2.5 p.s.i.g. shall be arranged to discharge in such a way as to prevent localized overheating of any part of the tank, in the event vapors from such vents are ignited.

(viii) Each commercial tank venting device shall have stamped on it the opening pressure, the pressure at which the valve reaches the full open position, and the flow capacity at the latter pressure, expressed in cubic feet per hour of air at 60°F. and at a pressure of 14.7 p.s.i.a.

(ix) The flow capacity of tank venting devices 12 inches and smaller in nominal pipe size shall be determined by actual test of each type and size of vent. These flow tests may be conducted by the manufacturer if certified by a qualified impartial observer, or may be conducted by an outside agency. The flow capacity of tank venting devices larger than 12 inches nominal pipe size, including manhole covers with long bolts or equivalent, may be calculated provided that the opening pressure is actually measured, the rating pressure and corresponding free orifice area are stated, the word "calculated" appears on the nameplate, and the computation is based

on a flow coefficient of 0.5 applied to the rated orifice area.

(f) Vent piping for aboveground tanks. (i) Vent piping shall be constructed in accordance with WAC 296-24-33007 of this section.

(ii) Where vent pipe outlets for tanks storing Class I liquids are adjacent to buildings or public ways, they shall be located so that the vapors are released at a safe point outside of buildings and not less than 12 feet above the adjacent ground level. In order to aid their dispersion, vapors shall be discharged upward or horizontally away from closely adjacent walls. Vent outlets shall be located so that flammable vapors will not be trapped by eaves or other obstructions and shall be at least five feet from building openings.

(iii) When tank vent piping is manifolded, pipe sizes shall be such as to discharge within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are subject to the same fire exposure.

(g) Drainage, dikes, and walls for aboveground tanks.

(i) Drainage and diked areas. The area surrounding a tank or a group of tanks shall be provided with drainage as in (2)(g)(ii) of this section, or shall be diked as provided in (2)(g)(iii), to prevent accidental discharge of liquid from endangering adjoining property or reaching waterways.

(ii) Drainage. Where protection of adjoining property or waterways is by means of a natural or manmade drainage system, such systems shall comply with the following:

(A) A slope of not less than 1 percent away from the tank toward the drainage system shall be provided.

(B) The drainage system shall terminate in vacant land or other area or in an impounding basin having a capacity not smaller than that of the largest tank served. This termination area and the route of the drainage system shall be so located that, if the flammable or combustible liquids in the drainage system are ignited, the fire will not seriously expose tanks or adjoining property.

(C) The drainage system, including automatic drainage pumps, shall not discharge to adjoining property, natural water courses, public sewers, or public drains unless the discharge of flammable or combustible liquids would not constitute a hazard, or the system is so designed that it will not permit flammable or combustible liquids to be released.

(iii) Diked areas. Where protection of adjoining property or waterways is accomplished by retaining the liquid around the tank by means of a dike, the volume of the diked area shall comply with the following requirements:

(A) Except as provided in (2)(g)(iii)(B) of this section, the volumetric capacity of the diked area shall not be less than the greatest amount of liquid that can be released from the largest tank within the diked area, assuming a full tank. The capacity of the diked area enclosing more than one tank shall be calculated by deducting the volume of the tanks other than the largest tank below the height of the dike.

(B) For a tank or group of tanks with fixed roofs containing crude petroleum with boilover characteristics,

the volumetric capacity of the diked area shall be not less than the capacity of the largest tank served by the enclosure, assuming a full tank. The capacity of the diked enclosure shall be calculated by deducting the volume below the height of the dike of all tanks within the enclosure.

(C) Walls of the diked area shall be of earth, steel, concrete or solid masonry designed to be liquidtight and to withstand a full hydrostatic head. Earthen walls 3 feet or more in height shall have a flat section at the top not less than 2 feet wide. The slope of an earthen wall shall be consistent with the angle of repose of the material of which the wall is constructed.

(D) The walls of the diked area shall be restricted to an average height of 6 feet above interior grade.

(E) Where provision is made for draining water from diked areas, drainage shall be provided at a uniform slope of not less than 1 percent away from tanks toward a sump, drainbox, or other safe means of disposal located at the greatest practical distance from the tank. Such drains shall normally be controlled in a manner so as to prevent flammable or combustible liquids from entering natural water courses, public sewers, or public drains, if their presence would constitute a hazard. Control of drainage shall be accessible under fire conditions.

(F) No loose combustible material, empty or full drum or barrel, shall be permitted within the diked area.

(G) Each diked area containing two or more tanks shall be subdivided preferably by drainage channels or at least by intermediate curbs in order to prevent spills from endangering adjacent tanks within the diked area as follows:

(aa) When storing normally stable liquids in vertical cone roof tanks constructed with weak roof-to-shell seam or approved floating roof tanks or when storing crude petroleum in producing areas in any type of tank, one subdivision for each tank in excess of 10,000 bbls. and one subdivision for each group of tanks (no tank exceeding 10,000 bbls. capacity) having an aggregate capacity not exceeding 15,000 bbls.

(bb) When storing normally stable flammable or combustible liquids in tanks not covered in (aa) of this section, one subdivision for each tank in excess of 100,000 gallons (2,500 bbls.) and one subdivision for each group of tanks (no tank exceeding 100,000 gallons capacity) having an aggregate capacity not exceeding 150,000 gallons (3,570 bbls.).

(cc) When storing unstable liquids in any type of tank, one subdivision for each tank except that tanks installed in accordance with the drainage requirements of NFPA 15-1969, Standard for Water Spray Fixed Systems for Fire Protection shall require no additional subdivision.

(dd) The drainage channels or intermediate curbs shall be located between tanks so as to take full advantage of the available space with due regard for the individual tank capacities. Intermediate curbs, where used, shall be not less than 18 inches in height.

(h) Tank openings other than vents for aboveground tanks. (i) Connections for all tank openings shall be vaportight and liquid tight. Vents are covered in (2)(d) through (f) of this section.

(ii) Each connection to an aboveground tank through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary, they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Each connection below the liquid level through which liquid does not normally flow shall be provided with a liquid tight closure. This may be a valve, plug, or blind, or a combination of these.

(iv) Openings for gaging shall be provided with a vapor tight cap or cover.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity. A fill pipe entering the top of a tank shall terminate within 6 inches of the bottom of the tank and shall be installed to avoid excessive vibration.

(vi) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquidtight when not in use. The connection shall be properly identified.

(3) Installation of Underground Tanks. (a) Location. Excavation for underground storage tanks shall be made with due care to avoid undermining of foundations of existing structures. Underground tanks or tanks under buildings shall be so located with respect to existing building foundations and supports that the loads carried by the latter cannot be transmitted to the tank. The distance from any part of a tank storing class I liquids to the nearest wall of any basement or pit shall be not less than 1 foot, and to any property line that may be built upon, not less than 3 feet. The distance from any part of a tank storing class II or class III liquids to the nearest wall of any basement, pit or property line shall not be less than 1 foot.

(b) Depth and cover. Underground tanks shall be set on firm foundations and surrounded with at least 6 inches of noncorrosive, inert materials such as clean sand, earth, or gravel well tamped in place. The tank shall be placed in the hole with care since dropping or rolling the tank into the hole can break a weld, puncture or damage the tank, or scrape off the protective coating of coated tanks. Tanks shall be covered with a minimum of 2 feet of earth or shall be covered with not less than 1 foot of earth, on top of which shall be placed a slab of reinforced concrete not less than 4 inches thick. When underground tanks are, or are likely to be, subject to traffic, they shall be protected against damage from vehicles passing over them by at least 3 feet of earth cover, or 18 inches of well-tamped earth, plus 6 inches of reinforced concrete or 8 inches of asphaltic concrete. When asphaltic or reinforced concrete paving is used as part of the protection, it shall extend at least 1 foot horizontally beyond the outline of the tank in all directions.

(c) Corrosion protection. Corrosion protection for the tank and its piping shall be provided by one or more of the following methods:

(i) Use of protective coatings or wrappings;

(ii) Cathodic protection; or,

(iii) Corrosion resistant materials of construction.

(d) Vents. (i) Location and arrangement of vents for class I liquids. Vent pipes from tanks storing class I liquids shall be so located that the discharge point is outside of buildings, higher than the fill pipe opening, and not less than 12 feet above the adjacent ground level. Vent pipes shall discharge only upward in order to disperse vapors. Vent pipes 2 inches or less in nominal inside diameter shall not be obstructed by devices that will cause excessive back pressure. Vent pipe outlets shall be so located that flammable vapors will not enter building openings, or be trapped under eaves or other obstructions. If the vent pipe is less than 10 feet in length, or greater than 2 inches in nominal inside diameter, the outlet shall be provided with a vacuum and pressure relief device or there shall be an approved flame arrester located in the vent line at the outlet or within the approved distance from the outlet.

(ii) Size of vents. Each tank shall be vented through piping adequate in size to prevent blow-back of vapor or liquid at the fill opening while the tank is being filled. Vent pipes shall be not less than 1 1/4 inch nominal inside diameter.

TABLE H-11
VENT LINE DIAMETERS

Maximum flow GPM	Pipe length*		
	50 feet	100 feet	200 feet
	Inches	Inches	Inches
100	1 1/4	1 1/4	1 1/4
200	1 1/4	1 1/4	1 1/4
300	1 1/4	1 1/4	1 1/2
400	1 1/4	1 1/2	2
500	1 1/2	1 1/2	2
600	1 1/2	2	2
700	2	2	2
800	2	2	3
900	2	2	3
1,000	2	2	3

*Vent lines of 50 ft., 100 ft., and 200 ft. of pipe plus 7 ells.

(iii) Location and arrangement of vents for class II or class III liquids. Vent pipes from tanks storing class II or class III flammable liquids shall terminate outside of the building and higher than the fill pipe opening. Vent outlets shall be above normal snow level. They may be fitted with return bends, coarse screens or other devices to minimize ingress of foreign material.

(iv) Vent piping shall be constructed in accordance with WAC 296-24-33007. Vent pipes shall be so laid as to drain toward the tank without sags or traps in which liquid can collect. They shall be located so that they will not be subjected to physical damage. The tank end of the vent pipe shall enter the tank through the top.

(v) When tank vent piping is manifolded, pipe sizes shall be such as to discharge, within the pressure limitations of the system, the vapors they may be required to handle when manifolded tanks are filled simultaneously.

(e) Tank openings other than vents. (i) Connections for all tank openings shall be vapor or liquid tight.

(ii) Openings for manual gaging, if independent of the fill pipe, shall be provided with a liquid-tight cap or cover. If inside a building, each such opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.

(iii) Fill and discharge lines shall enter tanks only through the top. Fill lines shall be sloped toward the tank.

(iv) For class IB and class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(v) Filling and emptying connections which are made and broken shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. Such connection shall be closed and liquid-tight when not in use. The connection shall be properly identified.

(4) Installation of Tanks Inside of Buildings. (a) Location. Tanks shall not be permitted inside of buildings except as provided in WAC 296-24-33011 and WAC 296-24-33015 through WAC 296-24-33019.

(b) Vents. Vents for tanks inside of buildings shall be as provided in (2)(d), (e), (f)(ii) and (3)(d) of this section, except that emergency venting by the use of weak roof seams on tanks shall not be permitted. Vents shall discharge vapors outside the buildings.

(c) Vent piping. Vent piping shall be constructed in accordance with WAC 296-24-33007.

(d) Tank openings other than vents. (i) Connections for all tank openings shall be vapor or liquidtight. Vents are covered in (4)(b) of this section.

(ii) Each connection to a tank inside of buildings through which liquid can normally flow shall be provided with an internal or an external valve located as close as practical to the shell of the tank. Such valves, when external, and their connections to the tank shall be of steel except when the chemical characteristics of the liquid stored are incompatible with steel. When materials other than steel are necessary, they shall be suitable for the pressures, structural stresses, and temperatures involved, including fire exposures.

(iii) Flammable or combustible liquid tanks located inside of buildings, except in one-story buildings designed and protected for flammable or combustible liquid storage, shall be provided with an automatic-closing heat-actuated valve on each withdrawal connection below the liquid level, except for connections used for emergency disposal, to prevent continued flow in the event of fire in the vicinity of the tank. This function may be incorporated in the valve required in (4)(d)(ii) of this section, and if a separate valve, shall be located adjacent to the valve required in (4)(d)(ii) of this section.

(iv) Openings for manual gaging, if independent of the fill pipe (see (4)(d)(vi) of this section), shall be provided with a vaportight cap or cover. Each such opening shall be protected against liquid overflow and possible vapor release by means of a spring loaded check valve or other approved device.

(v) For Class IB and Class IC liquids other than crude oils, gasolines, and asphalts, the fill pipe shall be so designed and installed as to minimize the possibility of generating static electricity by terminating within 6 inches of the bottom of the tank.

(vi) The fill pipe inside of the tank shall be installed to avoid excessive vibration of the pipe.

(vii) The inlet of the fill pipe shall be located outside of buildings at a location free from any source of ignition and not less than 5 feet away from any building opening. The inlet of the fill pipe shall be closed and liquidtight when not in use. The fill connection shall be properly identified.

(viii) Tanks inside buildings shall be equipped with a device, or other means shall be provided, to prevent overflow into the building.

(5) Supports, Foundations, and Anchorage for all Tank Locations. (a) General. Tank supports shall be installed on firm foundations. Tank supports shall be of concrete, masonry, or protected steel. Single wood timber supports (not cribbing) laid horizontally may be used for outside aboveground tanks if not more than 12 inches high at their lowest point.

(b) Fire resistance. Steel supports or exposed piling shall be protected by materials having a fire resistance rating of not less than 2 hours, except that steel saddles need not be protected if less than 12 inches high at their lowest point. Water spray protection or its equivalent may be used in lieu of fire-resistive materials to protect supports.

(c) Spheres. The design of the supporting structure for tanks such as spheres shall receive special engineering consideration.

(d) Load distribution. Every tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the shell.

(e) Foundations. Tanks shall rest on the ground or on foundations made of concrete, masonry, piling, or steel. Tank foundations shall be designed to minimize the possibility of uneven settling of the tank and to minimize corrosion in any part of the tank resting on the foundation.

(f) Flood areas. Where a tank is located in an area that may be subjected to flooding, the applicable precautions outlined in (5)(f) of this section shall be observed.

(i) No aboveground vertical storage tank containing a flammable or combustible liquid shall be located so that the allowable liquid level within the tank is below the established maximum flood stage, unless the tank is provided with a guiding structure such as described in (5)(f)(xiii), (xiv) and (xv) of this section.

(ii) Independent water supply facilities shall be provided at locations where there is no ample and dependable public water supply available for loading partially empty tanks with water.

(iii) In addition to the preceding requirements, each tank so located that more than 70 percent, but less than 100 percent, of its allowable liquid storage capacity will be submerged at the established maximum flood stage, shall be safeguarded by one of the following methods: Tank shall be raised, or its height shall be increased, until its top extends above the maximum flood stage a distance equivalent to 30 percent or more of its allowable liquid storage capacity: *Provided, however*, that the submerged part of the tank shall not exceed two and one-half times the diameter. Or, as an alternative to the foregoing, adequate noncombustible structural guides, designed to permit the tank to float vertically without loss of product, shall be provided.

(iv) Each horizontal tank so located that more than 70 percent of its storage capacity will be submerged at the established flood stage, shall be anchored, attached to a foundation of concrete or of steel and concrete, of sufficient weight to provide adequate load for the tank when filled with flammable or combustible liquid and submerged by flood waters to the established flood stage, or adequately secured by other means.

(v) Spherical and spheroidal tanks shall be protected by applicable methods as specified for either vertical or horizontal tanks.

(vi) At locations where there is no ample and dependable water supply, or where filling of underground tanks with liquid is impracticable because of the character of their contents, their use, or for other reasons, each tank shall be safeguarded against movement when empty and submerged by high ground water or flood waters by anchoring, weighting with concrete or other approved solid loading material, or securing by other means. Each such tank shall be so constructed and installed that it will safely resist external pressures due to high ground water or flood waters.

(vii) At locations where there is an ample and dependable water supply available, underground tanks containing flammable or combustible liquids, so installed that more than 70 percent of their storage capacity will be submerged at the maximum flood stage, shall be so anchored, weighted, or secured by other means, as to prevent movement of such tanks when filled with flammable or combustible liquids, and submerged by flood waters to the established flood stage.

(viii) Pipe connections below the allowable liquid level in a tank shall be provided with valves or cocks located as closely as practicable to the tank shell. Such valves and their connections to tanks shall be of steel or other material suitable for use with the liquid being stored. Cast iron shall not be used.

(ix) At locations where an independent water supply is required, it shall be entirely independent of public power and water supply. Independent source of water shall be available when flood waters reach a level not less than 10 feet below the bottom of the lowest tank on a property.

(x) The self-contained power and pumping unit shall be so located or so designed that pumping into tanks may be carried on continuously throughout the rise in flood waters from a level 10 feet below the lowest tank to the level of the potential flood stage.

(xi) Capacity of the pumping unit shall be such that the rate of rise of water in all tanks shall be equivalent to the established potential average rate of rise of flood waters at any stage.

(xii) Each independent pumping unit shall be tested periodically to insure that it is in satisfactory operating condition.

(xiii) Structural guides for holding floating tanks above their foundations shall be so designed that there will be no resistance to the free rise of a tank, and shall be constructed of noncombustible material.

(xiv) The strength of the structure shall be adequate to resist lateral movement of a tank subject to a horizontal force in any direction equivalent to not less than 25 pounds per square foot acting on the projected vertical cross-sectional area of the tank.

(xv) Where tanks are situated on exposed points or bends in a shoreline where swift currents in flood waters will be present, the structures shall be designed to withstand a unit force of not less than 50 pounds per square foot.

(xvi) The filling of a tank to be protected by water loading shall be started as soon as flood waters reach a dangerous flood stage. The rate of filling shall be at least equal to the rate of rise of the floodwaters (or the established average potential rate of rise).

(xvii) Sufficient fuel to operate the water pumps shall be available at all times to insure adequate power to fill all tankage with water.

(xviii) All valves on connecting pipelines shall be closed and locked in closed position when water loading has been completed.

(xix) Where structural guides are provided for the protection of floating tanks, all rigid connections between tanks and pipelines shall be disconnected and blanked off or banded before the floodwaters reach the bottom of the tank, unless control valves and their connections to the tank are of a type designed to prevent breakage between the valve and the tank shell.

(xx) All valves attached to tanks other than those used in connection with water loading operations shall be closed and locked.

(xxi) If a tank is equipped with a swing line, the swing pipe shall be raised to and secured at its highest position.

(xxii) Inspections. The Director or his designated representative shall make periodic inspections of all plants where the storage of flammable or combustible liquids is such as to require compliance with the foregoing requirements, in order to assure the following:

(A) That all flammable or combustible liquid storage tanks are in compliance with these requirements and so maintained.

(B) That detailed printed instructions of what to do in flood emergencies are properly posted.

(C) That station operators and other employees depended upon to carry out such instructions are thoroughly informed as to the location and operation of such valves and other equipment necessary to effect these requirements.

(g) Earthquake areas. In areas subject to earthquakes, the tank supports and connections shall be designed to resist damage as a result of such shocks.

(6) Sources of Ignition. In locations where flammable vapors may be present, precautions shall be taken to prevent ignition by eliminating or controlling sources of ignition. Sources of ignition may include open flames, lightning, smoking, cutting and welding, hot surfaces, frictional heat, sparks (static, electrical, and mechanical), spontaneous ignition, chemical and physical-chemical reactions, and radiant heat.

(7) Testing. (a) General. All tanks, whether shop built or field erected, shall be strength tested before they are placed in service in accordance with the applicable sections of the code under which they were built. The American Society of Mechanical Engineers (ASME) code stamp, American Petroleum Institute (API) monogram, or the label of the Underwriters' Laboratories, Inc., on a tank shall be evidence of compliance with this strength test. Tanks not marked in accordance with the above codes shall be strength tested before they are placed in service in accordance with good engineering principles and reference shall be made to the sections on testing in the codes listed in (1)(c)(i), (d)(ii) or (e)(ii) of this section.

(b) Strength. When the vertical length of the fill and vent pipes is such that when filled with liquid the static head imposed upon the bottom of the tank exceeds 10 pounds per square inch, the tank and related piping shall be tested hydrostatically to a pressure equal to the static head thus imposed.

(c) Tightness. In addition to the strength test called for in (7)(a) and (b), all tanks and connections shall be tested for tightness. Except for underground tanks, this tightness test shall be made at operating pressure with air, inert gas, or water prior to placing the tank in service. In the case of field-erected tanks the strength test may be considered to be the test for tank tightness. Underground tanks and piping, before being covered, enclosed, or placed in use, shall be tested for tightness hydrostatically, or with air pressure at not less than 3 pounds per square inch and not more than 5 pounds per square inch.

(d) Repairs. All leaks or deformations shall be corrected in an acceptable manner before the tank is placed in service. Mechanical caulking is not permitted for correcting leaks in welded tanks except pinhole leaks in the roof.

(e) Derated operations. Tanks to be operated at pressures below their design pressure may be tested by the applicable provisions of (7)(a) or (b) based upon the pressure developed under full emergency venting of the tank. [Order 76-6, § 296-24-33005, filed 3/1/76; Order 73-5, § 296-24-33005, filed 5/9/73 and Order 73-4, § 296-24-33005, filed 5/7/73.]

WAC 296-24-33007 Piping, valves, and fittings. (1) General. (a) Design. The design (including selection of materials) fabrication, assembly, test, and inspection of piping systems containing flammable or combustible liquids shall be suitable for the expected working pressures and structural stresses. Conformity with the applicable provisions of Pressure Piping, ANSI B31-1967 series and the provisions of this section, shall be considered

prima facie evidence of compliance with the foregoing provisions.

(b) Exceptions. This section does not apply to any of the following:

(i) Tubing or casing on any oil or gas wells and any piping connected directly thereto.

(ii) Motor vehicle, aircraft, boat, or portable or stationary engines.

(iii) Piping within the scope of any applicable boiler and pressures vessel code.

(c) Definitions. As used in this section, piping systems consist of pipe, tubing flanges, bolting, gaskets, valves, fittings, the pressure containing parts of other components such as expansion joints and strainers, and devices which serve such purposes as mixing, separating, snubbing, distributing, metering, or controlling flow.

(2) Materials for Piping, Valves, and Fittings. (a) Required materials. Materials for piping, valves, or fittings shall be steel, nodular iron or malleable iron, except as provided in subsections (b), (c) and (d).

(b) Exceptions. Materials other than steel, nodular iron, or malleable iron may be used underground, or if required by the properties of the flammable or combustible liquid handled. Material other than steel, nodular iron, or malleable iron shall be designed to specifications embodying principles recognized as good engineering practices for the material used.

(c) Linings. Piping, valves, and fittings may have combustible or noncombustible linings.

(d) Low-melting materials. When low-melting point materials such as aluminum and brass or materials that soften on fire exposure such as plastics, or nonductile materials such as cast iron, are necessary, special consideration shall be given to their behavior on fire exposure. If such materials are used in aboveground piping systems or inside buildings, they shall be suitably protected against fire exposure or so located that any spill resulting from the failure of these materials could not unduly expose persons, important buildings or structures or can be readily controlled by remote valves.

(3) Pipe Joints. Joints shall be made liquid tight. Welded or screwed joints or approved connectors shall be used. Threaded joints and connections shall be made up tight with a suitable lubricant or piping compound. Pipe joints dependent upon the friction characteristics of combustible materials for mechanical continuity of piping shall not be used inside buildings. They may be used outside of buildings above or below ground. If used aboveground, the piping shall either be secured to prevent disengagement at the fitting or the piping system shall be so designed that any spill resulting from such disengagement could not unduly expose persons, important buildings or structures, and could be readily controlled by remote valves.

(4) Supports. Piping systems shall be substantially supported and protected against physical damage and excessive stresses arising from settlement, vibration, expansion, or contraction.

(5) Protection Against Corrosion. All piping for flammable or combustible liquids, both aboveground and underground, where subject to external corrosion, shall be painted or otherwise protected.

(6) Valves. Piping systems shall contain a sufficient number of valves to operate the system properly and to protect the plant. Piping systems in connection with pumps shall contain a sufficient number of valves to control properly the flow of liquid in normal operation and in the event of physical damage. Each connection to pipelines, by which equipment such as tankcars or tank vehicles discharge liquids by means of pumps into storage tanks, shall be provided with a check valve for automatic protection against backflow if the piping arrangement is such that backflow from the system is possible.

(7) Testing. All piping before being covered, enclosed, or placed in use shall be hydrostatically tested to 150 percent of the maximum anticipated pressure of the system, or pneumatically tested to 110 percent of the maximum anticipated pressure of the system, but not less than 5 pounds per square inch gage at the highest point of the system. This test shall be maintained for a sufficient time to complete visual inspection of all joints and connections, but for at least 10 minutes. [Order 76-6, § 296-24-33007, filed 3/1/76; Order 73-5, § 296-24-33007, filed 5/9/73 and Order 73-4, § 296-24-33007, filed 5/7/73.]

WAC 296-24-33009 Container and portable tank storage. (1) Scope. (a) General. This section shall apply only to the storage of flammable or combustible liquids in drums or other containers (including flammable aerosols) not exceeding 60 gallons individual capacity and those portable tanks not exceeding 660 gallons individual capacity.

(b) Exceptions. This section shall not apply to the following:

(i) Storage of containers in bulk plants, service stations, refineries, chemical plants, and distilleries;

(ii) Class I or Class II liquids in the fuel tanks of a motor vehicle, aircraft, boat, or portable or stationary engine;

(iii) Flammable or combustible paints, oils, varnishes, and similar mixtures used for painting or maintenance when not kept for a period in excess of 30 days;

(iv) Beverages when packaged in individual containers not exceeding 1 gallon in size.

(2) Design, Construction, and Capacity of Containers. (a) General. Only approved containers and portable tanks shall be used. Metal containers and portable tanks meeting the requirements of and containing products authorized by Chapter I, Title 49 of the code of Federal Regulations - October 1, 1972, (regulations issued by the Hazardous Materials Regulations Board, Department of Transportation), shall be deemed to be acceptable.

(b) Emergency Venting. Each portable tank shall be provided with one or more devices installed in the top with sufficient emergency venting capacity to limit internal pressure under fire exposure conditions to 10 p.s.i.g., or 30 percent of the bursting pressure of the tank, whichever is greater. The total venting capacity shall be not less than that specified in WAC 296-24-33005(2)(e)(iii) or (v). At least one pressure-actuated vent having a minimum capacity of 6,000 cubic feet of

free air (14.7 p.s.i.a. and 60°F.) shall be used. It shall be set to open at not less than 5 p.s.i.g. If fusible vents are used, they shall be actuated by elements that operate at a temperature not exceeding 300°F.

TABLE H-12
MAXIMUM ALLOWABLE SIZE OF
CONTAINERS AND PORTABLE TANKS

Container Type	Flammable liquids			Combustible Liquids	
	Class IA	Class IB	Class IC	Class II &	Class III
Glass or approved plastic	1 pt.	1 qu.	1 gal.	1 gal.	1 gal.
Metal (other than DOT drums)	1 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Safety cans	2 gal.	5 gal.	5 gal.	5 gal.	5 gal.
Metal drums (DOT spec.)	60 gal.	60 gal.	60 gal.	60 gal.	60 gal.
Approved portable tanks	660 gal.	660 gal.	660 gal.	660 gal.	660 gal.

Container exemptions: (i) Medicines, beverages, food-stuffs, cosmetics and other common consumer items, when packaged according to commonly accepted practices, shall be exempt from the requirements of (4)(a) and (b) of this section.

(c) Size. Flammable and combustible liquid containers shall be in accordance with Table H-12, except that glass or plastic containers of no more than 1-gallon capacity may be used for a Class IA or IB flammable liquid if:

(i) Such liquid either would be rendered unfit for its intended use by contact with metal or would excessively corrode a metal container so as to create a leakage hazard; and

(ii) The user's process either would require more than 1 pint of Class IA liquid or more than 1 quart of a Class IB liquid of a single assay lot to be used at one time, or would require the maintenance of an analytical standard liquid of a quality which is not met by the specified standards of liquids available, and the quantity of the analytical standard liquid required to be used in any one control process exceeds one-sixteenth the capacity of the container allowed under Table H-12 for the class of liquid; or

(iii) The containers are intended for direct export outside the United States.

(3) Design, Construction, and Capacity of Storage Cabinets. (a) Maximum capacity. Not more than 60 gallons of Class I or Class II liquids, nor more than 120 gallons of Class III liquids may be stored in a storage cabinet.

(b) Fire resistance. Storage cabinets shall be designed and constructed to limit the internal temperature to not more than 325°F. when subjected to a 10-minute fire test using the standard time-temperature curve as set forth in Standard Methods of Fire Tests of Building Construction and Materials, NFPA 251-1969. All joints and seams shall remain tight and the door shall remain

securely closed during the fire test. Cabinets shall be labeled "Flammable—Keep Fire Away," to meet specifications set forth in WAC 296-24-140.

(i) Metal cabinets constructed in the following manner shall be deemed to be in compliance. The bottom, top, door, and sides of cabinet shall be at least No. 18 gage sheet iron and double walled with 1 1/2-inch air space. Joints shall be riveted, welded or made tight by some equally effective means. The door shall be provided with a three-point lock, and the door sill shall be raised at least 2 inches above the bottom of the cabinet.

(ii) Wooden cabinets constructed in the following manner shall be deemed in compliance. The bottom, sides, and top shall be constructed of an approved grade of plywood at least 1 inch in thickness, which shall not break down or delaminate under fire conditions. All joints shall be rabbetted and shall be fastened in two directions with flathead woodscrews. When more than one door is used, there shall be a rabbetted overlap of not less than 1 inch. Hinges shall be mounted in such a manner as not to lose their holding capacity due to loosening or burning out of the screws when subjected to the fire test.

(4) Design and Construction of Inside Storage Rooms.

(a) Construction. Inside storage rooms 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 Tests of Building Construction and Materials, NFPA 251-1969. Where an automatic sprinkler system is provided, the system shall be designed and installed in an acceptable 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 properties are exposed, windows shall be protected as set forth in the Standard for Fire Doors and Windows, NFPA No. 80-1968, for class E or F openings. Wood at least 1 inch nominal thickness may be used for shelving, racks, dunnage, scuffboards, floor overlay, and similar installations.

(b) Rating and capacity. Storage in inside storage rooms shall comply with Table H-13.

TABLE H-13
STORAGE IN INSIDE ROOMS

Fire protection* provided	Fire resistance	Maximum size	Total allowable quantities (gals./sq. ft./floor area)
Yes _____	2 hours _____	500 sq.ft. _____	10 _____
No _____	2 hours _____	500 sq.ft. _____	4 _____

TABLE H-13
STORAGE IN INSIDE ROOMS

Fire protection* provided	Fire resistance	Maximum size	Total allowable quantities (gals./sq. ft./floor area)
Yes _____	1 hour _____	150 sq.ft. _____	5 _____
No _____	1 hour _____	150 sq.ft. _____	2 _____

*Fire protection system shall be sprinkler, water spray, carbon dioxide, or other system.

(c) Wiring. Electrical wiring and equipment located in inside storage rooms used for class I liquids shall be approved under WAC 296-24-950 and WAC 296-24-955 for Class I, Division 2 Hazardous Locations; for class II and class III liquids, shall be approved for general use.

(d) Ventilation. Every inside storage room shall be provided with either a gravity or a mechanical exhaust ventilation system. Such system shall be designed to provide for a complete change of air within the room at least six times per hour. If a mechanical exhaust 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. A pilot light shall be installed adjacent to the switch if class I flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhaust outlet from the room, shall be on the exterior of the building in which the room is located.

(e) Storage in inside storage rooms. 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. Dispensing shall be by approved pump or self-closing faucet only.

(5) Storage Inside Building. (a) Egress. Flammable or combustible liquids, including stock for sale, shall not be stored so as to limit use of exits, stairways, or areas normally used for the safe egress of people.

(b) Containers. The storage of flammable or combustible liquids in containers or portable tanks shall comply with (4)(c) through (e) of this section.

(c) Office occupancies. Storage shall be prohibited except that which is required for maintenance and operation of building and operation of equipment. Such storage shall be kept in closed metal containers stored in a storage cabinet or in safety cans or in an inside storage room not having a door that opens into that portion of the building used by the public.

(d) Mercantile occupancies and other retail stores. (i) In rooms or areas accessible to the public, storage shall be limited to quantities needed for display and normal merchandising purposes but shall not exceed 2 gallons per square foot of gross floor area. The gross floor area used for computing the maximum quantity permitted shall be considered as that portion of the store actually being used for merchandising flammable and combustible liquids.

(ii) Where the aggregate quantity of additional stock exceeds 60 gallons of Class IA, or 120 gallons of Class IB, or 180 gallons of Class IC, or 240 gallons of Class II, or 500 gallons of Class III liquids, or any combination of Class I and Class II liquids exceeding 240 gallons, it shall be stored in a room or portion of the building that complies with the construction provisions for an inside storage room as prescribed in (4) of this section. For water miscible liquids, these quantities may be doubled.

(iii) Containers in a display area shall not be stacked more than 3 feet or two containers high, whichever is the greater, unless the stacking is done on fixed shelving or is otherwise satisfactorily secured.

(iv) Shelving shall be of stable construction, of sufficient depth and arrangement such that containers displayed thereon shall not be easily displaced.

(v) Leaking containers shall be removed to a storage room or taken to a safe location outside the building and the contents transferred to an undamaged container.

(e) General purpose public warehouses. Storage shall be in accordance with Table H-14 or H-15 and in buildings or in portions of such buildings cut off by standard firewalls. Material creating no fire exposure hazard to the flammable or combustible liquids may be stored in the same area.

TABLE H-14
INDOOR CONTAINER STORAGE

Class liquid	Storage level	Protected storage maximum per pile		Unprotected storage maximum per pile	
		Gal.	Ht.	Gal.	Ht.
IA—	Ground and upper floors	2,750 (50)	3 ft. (1)	660 (12)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IB—	Ground and upper floors	5,500 (100)	6 ft. (2)	1,375 (25)	3 ft. (1)
	Basement	Not permitted		Not permitted	
IC—	Ground and upper floors	16,500 (300)	6 ft. (2)	4,125 (75)	3 ft. (1)
	Basement	Not permitted		Not permitted	
II—	Ground and upper floors	16,500 (300)	9 ft. (3)	4,125 (75)	9 ft. (3)
	Basement	5,500 (100)	9 ft. (3)	Not permitted	
III—	Ground and upper floors	55,000 (1,000)	15 ft. (5)	13,750 (250)	12 ft. (4)
	Basement	8,250 (450)	9 ft. (3)	Not permitted	

NOTE 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile shall be the smallest of the 2 or more separate maximum gallonages.

NOTE 2: Aisles shall be provided so that no container is more than 12 ft. from an aisle. Main aisles shall be at least 8 ft. wide and side aisles at least 4 ft. wide.

(Numbers in parentheses indicate corresponding number of 55-gal. drums.)

NOTE 3: Each pile shall be separated from each other by at least 4 ft.

TABLE H-15
INDOOR PORTABLE TANK STORAGE

Class liquid	Storage level	Protected storage maximum per pile		Unprotected storage maximum per pile	
		Gals.	Ht.	Gals.	Ht.
IA—	Ground and upper floors	Not permitted		Not permitted	
	Basement	Not permitted		Not permitted	
IB—	Ground and upper floors	20,000	7 ft.	2,000	7 ft.
	Basement	Not permitted		Not permitted	
IC—	Ground and upper floors	40,000	14 ft.	5,500	7 ft.
	Basement	Not permitted		Not permitted	
II—	Ground and upper floors	40,000	14 ft.	5,500	7 ft.
	Basement	20,000	7 ft.	Not permitted	
III—	Ground and upper floors	60,000	14 ft.	22,000	7 ft.
	Basement	20,000	7 ft.	Not permitted	

NOTE 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage permitted in that pile shall be the smallest of the 2 or more separate maximum gallonages.

NOTE 2: Aisles shall be provided so that no portable tank is more than 12 ft. from an aisle. Main aisles shall be at least 8 ft. wide and side aisles at least 4 ft. wide.

NOTE 3: Each pile shall be separated from each other by at least 4 ft.

(f) Flammable and combustible liquid warehouses or storage buildings. (i) If the storage building is located 50 feet or less from a building or line of adjoining property that may be built upon, the exposing wall shall be a blank wall having a fire-resistance rating of at least 2 hours.

(ii) The total quantity of liquids within a building shall not be restricted, but the arrangement of storage shall comply with Table H-14 or H-15.

(iii) Containers in piles shall be separated by pallets or dunnage where necessary to provide stability and to prevent excessive stress on container walls.

(iv) Portable tanks stored over one tier high shall be designed to nest securely, without dunnage and adequate materials handling equipment shall be available to handle tanks safely at the upper tier level.

(v) No pile shall be closer than 3 feet to the nearest beam, chord, girder, or other obstruction, and shall be 3 feet below sprinkler deflectors or discharge orifices of water spray, or other overhead fire protection systems.

(vi) Aisles of at least 3 feet wide shall be provided where necessary for reasons of access to doors, windows or standpipe connections.

(6) Storage Outside Buildings. (a) General. Storage outside buildings shall be in accordance with Table H-16 or H-17, and (6)(b) and (d) of this section.

TABLE H-16
OUTDOOR CONTAINER STORAGE

1 Class	2 Maximum per pile (see note 1)	3 Distance between piles (see note 2)	4 Distance to property line that can be built upon (see notes 3 & 4)	5 Distance to street, alley, public way (see note 4)
IA	gal. 1,100	ft. 5	ft. 20	ft. 10
IB	2,200	5	20	10
IC	4,400	5	20	10
II	8,800	5	10	5
III	22,000	5	10	5

- NOTE 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile shall be the smallest of the 2 or more separate gallonages.
- NOTE 2: Within 200 ft. of each container, there shall be 12-ft. wide access way to permit approach of fire control apparatus.
- NOTE 3: The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 shall be doubled.
- NOTE 4: When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

(b) Maximum storage. A maximum of 1,100 gallons of flammable or combustible liquids may be located adjacent to buildings located on the same premises and under the same management provided the provisions of (6)(b)(i) and (ii) are complied with.

(i) The building shall be a one-story building devoted principally to the handling and storing of flammable or combustible liquids or the building shall have 2 hour fire-resistive exterior walls having no opening within 10 feet of such storage.

(ii) Where quantity stored exceeds 1,100 gallons, or provisions of (6)(b)(i) cannot be met, a minimum distance of 10 feet between buildings and nearest container of flammable or combustible liquid shall be maintained.

TABLE H-17
OUTDOOR PORTABLE TANK STORAGE

1 Class	2 Maximum per pile	3 Distance between piles	4 Distance to property line that can be built upon	5 Distance to street, alley, public way
	gal.	ft.	ft.	ft.
IA	2,200	5	20	10
IB	4,400	5	20	10
IC	8,800	5	20	10
II	17,600	5	10	5
III	44,000	5	10	5

- NOTE 1: When 2 or more classes of materials are stored in a single pile, the maximum gallonage in that pile shall be the smallest of the 2 or more separate gallonages.
- NOTE 2: Within 200 ft. of each portable tank, there shall be a 12-ft. wide access way to permit approach of fire control apparatus.
- NOTE 3: The distances listed apply to properties that have protection for exposures as defined. If there are exposures, and such protection for exposures does not exist, the distances in column 4 shall be doubled.
- NOTE 4: When total quantity stored does not exceed 50 percent of maximum per pile, the distances in columns 4 and 5 may be reduced 50 percent, but not less than 3 ft.

(c) Spill containment. 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 at least 6 inches high. When curbs are used, provisions shall be made for draining of 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) Security. The storage area shall be protected against tampering or trespassers where necessary and shall be kept free of weeds, debris and other combustible material not necessary to the storage.

(7) Fire Control. (a) Extinguishers. Suitable fire control devices, such as small hose or portable fire extinguishers, shall be available at locations where flammable or combustible liquids are stored.

(i) At least one portable fire extinguisher having a rating of not less than 12-B units shall be located outside of, but not more than 10 feet from, the door opening into any room used for storage.

(ii) At least one portable fire extinguisher having a rating of not less than 12-B units must be located not less than 10 feet, nor more than 25 feet, from any Class I or Class II liquid storage area located outside of a storage room but inside a building.

(b) Sprinklers. When sprinklers are provided, they shall be installed in accordance with WAC 296-24-605 through WAC 296-24-60509.

(c) Open flames and smoking. Open flames and smoking shall not be permitted in flammable or combustible liquid storage areas.

(d) Water reactive materials. Materials which will react with water shall not be stored in the same room with flammable or combustible liquids. [Order 76-6, § 296-24-33009, filed 3/1/76; Order 74-27, § 296-24-33009, filed 5/7/74; Order 73-5, § 296-24-33009, filed 5/9/73 and Order 73-4, § 296-24-33009, filed 5/7/73.]

WAC 296-24-33011 Industrial plants. (1) Scope.

(a) Application. This paragraph shall apply to those industrial plants where:

(i) The use of flammable or combustible liquids is incidental to the principal business, or

(ii) Where flammable or combustible liquids are handled or used only in unit physical operations such as mixing, drying, evaporating, filtering, distillation, and similar operations which do not involve chemical reaction. This section shall not apply to chemical plants, refineries or distilleries.

(b) Exceptions. Where portions of such plants involve chemical reactions such as oxidation, reduction, halogenation, hydrogenation, alkylation, polymerization, and other chemical processes, those portions of the plant shall be in accordance with WAC 296-24-33017.

(2) Incidental Storage or Use of Flammable and Combustible Liquids. (a) Application. This shall be applicable to those portions of an industrial plant where the use and handling of flammable or combustible liquids is only incidental to the principal business, such as automobile assembly, construction of electronic equipment, furniture manufacturing, or other similar activities.

(b) Containers. Flammable or combustible liquids shall be stored in tanks or closed containers.

(i) Except as provided in (2)(b)(ii) and (iii) of this section all storage shall comply with WAC 296-24-33009(3) or (4).

(ii) The quantity of liquid that may be located outside of an inside storage room or storage cabinet in a building or in any one fire area of a building shall not exceed:

(A) 25 gallons of Class IA liquids in containers

(B) 120 gallons of Class IB, IC, II, or III liquids in containers

(C) 660 gallons of Class IB, IC, II, or III liquids in a single portable tank.

(iii) Where large quantities of flammable or combustible liquids are necessary, storage may be in tanks which shall comply with the applicable requirements of WAC 296-24-33005.

(c) Separation and protection. Areas in which flammable or combustible liquids are transferred from one tank or container to another container shall be separated from other operations in the building by adequate distance or by construction having adequate fire resistance. Drainage or other means shall be provided to control spills. Adequate natural or mechanical ventilation shall be provided.

(d) Handling liquids at point of final use. (i) Flammable liquids shall be kept in covered containers when not actually in use.

(ii) Where flammable or combustible liquids are used or handled, except in closed containers, means shall be

provided to dispose promptly and safely of leakage or spills.

(iii) Class I liquids may be used only where there are no open flames or other sources of ignition within the possible path of vapor travel.

(iv) Flammable or combustible liquids shall be drawn from or transferred into vessels, containers, or portable tanks within a building 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 through an approved self-closing valve. Transferring by means of air pressure on the container or portable tanks shall be prohibited.

(3) Unit Physical Operations. (a) Application. This subdivision (3) shall be applicable in those portions of industrial plants where flammable or combustible liquids are handled or used in unit physical operations such as mixing, drying, evaporating, filtering, distillation, and similar operations which do not involve chemical change. Examples are plants compounding cosmetics, pharmaceuticals, solvents, cleaning fluids, insecticides, and similar types of activities.

(b) Location. Industrial plants shall be located so that each building or unit of equipment is accessible from at least one side for firefighting and fire control purposes. Buildings shall be located with respect to lines of adjoining property which may be built upon as set forth in WAC 296-24-33017(2)(a) and (b) except that the blank wall referred to in WAC 296-24-33017(2)(b) shall have a fire resistance rating of at least 2 hours.

(c) Chemical processes. Areas where unstable liquids are handled or small scale unit chemical processes are carried on shall be separated from the remainder of the plant by a fire wall of 2-hour minimum fire resistance rating.

(d) Drainage. (i) Emergency drainage systems shall be provided to direct flammable or combustible liquid leakage and fire protection water to a safe location. This may require curbs, scuppers, or special drainage systems to control the spread of fire; see WAC 296-24-33005(2)(g)(ii).

(ii) Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

(iii) The industrial plant shall be designed and operated to prevent the normal discharge of flammable or combustible liquids into public waterways, public sewers, or adjoining property.

(e) Ventilation. (i) Areas as defined in (1)(a) of this section using Class I liquids shall be ventilated at a rate of not less than 1 cubic foot per minute per square foot of solid floor area. This shall be accomplished by natural or mechanical ventilation with discharge or exhaust to a safe location outside of the building. Provision shall be made for introduction of makeup air in such a manner as not to short circuit the ventilation. Ventilation shall be arranged to include all floor areas or pits where flammable vapors may collect.

(ii) Equipment used in a building and the ventilation of the building shall be designed so as to limit flammable vapor-air mixtures under normal operating conditions to the interior of equipment, and to not more than

5 feet from equipment which exposes Class I liquids to the air. Examples of such equipment are dispensing stations, open centrifuges, plate and frame filters, open vacuum filters, and surfaces of open equipment.

(f) Storage and handling. The storage, transfer, and handling of liquid shall comply with WAC 296-24-33017(4) of this section.

(4) Tank Vehicle and Tank Car Loading and Unloading. (a) Tank vehicle and tank car loading or unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings or nearest line of adjoining property which may be built upon by a distance of 25 feet for Class I liquids and 15 feet for Class II and Class III liquids measured from the nearest position of any fill stem. Buildings for pumps or shelters for personnel may be a part of the facility. Operations of the facility shall comply with the appropriate portions of WAC 296-24-33013(3).

(5) Fire Control. (a) Portable and special equipment. Portable fire extinguishment and control equipment shall be provided in such quantities and types as are needed for the special hazards of operation and storage.

(b) Water supply. Water shall be available in volume and at adequate pressure to supply water hose streams, foam-producing equipment, automatic sprinklers, or water spray systems as the need is indicated by the special hazards of operation, dispensing and storage.

(c) Special extinguishers. Special extinguishing equipment such as that utilizing foam, inert gas, or dry chemical shall be provided as the need is indicated by the special hazards of operation dispensing and storage.

(d) Special hazards. Where the need is indicated by special hazards of operation, flammable or combustible liquid processing equipment, major piping, and supporting steel shall be protected by approved water spray systems, deluge systems, approved fire-resistant coatings, insulation, or any combination of these.

(e) Maintenance. All plant fire protection facilities shall be adequately maintained and periodically inspected and tested to make sure they are always in satisfactory operating condition, and they will serve their purpose in time of emergency.

(6) Sources of Ignition. (a) General. Adequate precautions shall be taken to prevent the ignition of flammable vapors. Sources of ignition include but are not limited to open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical and mechanical sparks; spontaneous ignition, including heat-producing chemical reactions; and radiant heat.

(b) Grounding. Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of these standards shall be deemed to have been complied with.

(7) Electrical. (a) Equipment. (i) All electrical wiring and equipment shall be installed according to the requirements of WAC 296-24-950 and 296-24-955.

(ii) Locations where flammable vapor-air mixtures may exist under normal operations shall be classified

Class I, Division 1 according to the requirements of WAC 296-24-950 and WAC 296-24-955. For those pieces of equipment installed in accordance with (3)(e)(ii), the Division 1 area shall extend 5 feet in all directions from all points of vapor liberation. All areas within pits shall be classified Division 1 if any part of the pit is within a Division 1 or 2 classified area, unless the pit is provided with mechanical ventilation.

(iii) Locations where flammable vapor-air mixtures may exist under abnormal conditions and for a distance beyond Division 1 locations shall be classified Division 2 according to the requirements of WAC 296-24-950 and WAC 296-24-955. These locations include an area within 20 feet horizontally, 3 feet vertically beyond a Division 1 area, and up to 3 feet above floor or grade level within 25 feet, if indoors, or 10 feet if outdoors, from any pump, bleeder, withdrawal fitting, meter, or similar device handling Class I liquids. Pits provided with adequate mechanical ventilation within a Division 1 or 2 area shall be classified Division 2. If Class II or Class III liquids only are handled, then ordinary electrical equipment is satisfactory though care shall be used in locating electrical apparatus to prevent hot metal from falling into open equipment.

(iv) Where the provisions of (i), (ii) and (iii) of this section require the installation of electrical equipment suitable for Class I, Division 1 or Division 2 locations, ordinary electrical equipment including switchgear may be used if installed in a room or enclosure which is maintained under positive pressure with respect to the hazardous area. Ventilation makeup air shall be uncontaminated by flammable vapors.

(8) Repairs to Equipment. Hot work, such as welding or cutting operations, use of spark-producing power tools, and chipping operations shall be permitted only under supervision of an individual in responsible charge. The individual in responsible charge shall make an inspection of the area to be sure that it is safe for the work to be done and that safe procedures will be followed for the work specified.

(9) Housekeeping. (a) General. Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.

(b) Access. Adequate aisles shall be maintained for unobstructed movement of personnel and so that fire protection equipment can be brought to bear on any part of flammable or combustible liquid storage, use, or any unit physical operation.

(c) Waste and residue. Combustible waste material and residues in a building or unit operating area shall be kept to a minimum, stored in covered metal receptacles and disposed of daily.

(d) Clear zone. Ground area around buildings and unit operating areas shall be kept free of weeds, trash, or other unnecessary combustible materials. [Order 76-6, § 296-24-33011, filed 3/1/76; Order 73-5, § 296-24-33011, filed 5/9/73 and Order 73-4, § 296-24-33011, filed 5/7/73.]

WAC 296-24-33013 Bulk plants. (1) Storage. (a) Class I liquids. Class I liquids shall be stored in closed containers, or in storage tanks above ground outside of buildings, or underground in accordance with WAC 296-24-33005.

(b) Class II and III liquids. Class II and Class III liquids shall be stored in containers, or in tanks within buildings or above ground outside of buildings, or underground in accordance with WAC 296-24-33005.

(c) Piling containers. Containers of flammable or combustible liquids when piled one upon the other shall be separated by dunnage sufficient to provide stability and to prevent excessive stress on container walls. The height of the pile shall be consistent with the stability and strength of containers.

(2) Buildings. (a) Exits. Rooms in which flammable or combustible liquids are stored or handled by pumps shall have exit facilities arranged to prevent occupants from being trapped in the event of fire.

(b) Heating. Rooms in which Class I liquids are stored or handled shall be heated only by means not constituting a source of ignition, such as steam or hot water. Rooms containing heating appliances involving sources of ignition shall be located and arranged to prevent entry of flammable vapors.

(c) Ventilation. (i) Ventilation shall be provided for all rooms, buildings, or enclosures in which Class I liquids are pumped or dispensed. Design of ventilation systems shall take into account the relatively high specific gravity of the vapors. Ventilation may be provided by adequate openings in outside walls at floor level unobstructed except by louvers or coarse screens. Where natural ventilation is inadequate, mechanical ventilation shall be provided.

(ii) Class I liquids shall not be stored or handled within a building having a basement or pit into which flammable vapors may travel, unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.

(iii) Containers of Class I liquids shall not be drawn from or filled within buildings unless provision is made to prevent the accumulation of flammable vapors in hazardous concentrations. Where mechanical ventilation is required, it shall be kept in operation while flammable liquids are being handled.

(3) Loading and Unloading Facilities. (a) Separation. Tank vehicle and tank car loading or unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings or nearest line of adjoining property that may be built upon by a distance of 25 feet for Class I liquids and 15 feet for Class II and Class III liquids measured from the nearest position of any fill spout. Buildings for pumps or shelters for personnel may be a part of the facility.

(b) Class restriction. Equipment such as piping, pumps, and meters used for the transfer of Class I liquids between storage tanks and the fill stem of the loading rack shall not be used for the transfer of Class II or Class III liquids.

(c) Valves. Valves used for the final control for filling tank vehicles shall be of the self-closing type and manually held open except where automatic means are provided for shutting off the flow when the vehicle is full or after filling of a preset amount.

(d) Static protection. (i) Bonding facilities for protection against static sparks during the loading of tank vehicles through open domes shall be provided:

(A) Where Class I liquids are loaded, or

(B) Where Class II or Class III liquids are loaded into vehicles which may contain vapors from previous cargoes of Class I liquids.

(ii) Protection as required in (3)(d)(i) of this section shall consist of a metallic bond wire permanently electrically connected to the fill stem or to some part of the rack structure in electrical contact with the fill stem. The free end of such wire shall be provided with a clamp or equivalent device for convenient attachment to some metallic part in electrical contact with the cargo tank of the tank vehicle.

(iii) Such bonding connection shall be made fast to the vehicle or tank before dome covers are raised and shall remain in place until filling is completed and all dome covers have been closed and secured.

(iv) Bonding as specified in (3)(d)(i), (ii) and (iii) of this section is not required:

(A) Where vehicles are loaded exclusively with products not having a static accumulating tendency, such as asphalt, most crude oils, residual oils, and water soluble liquids;

(B) Where no Class I liquids are handled at the loading facility and the tank vehicles loaded are used exclusively for Class II and Class III liquids; and

(C) Where vehicles are loaded or unloaded through closed bottom or top connections.

(v) Filling through open domes into the tanks of tank vehicles or tank cars, that contain vapor-air mixtures within the flammable range or where the liquid being filled can form such a mixture, shall be by means of a downspout which extends near the bottom of the tank. This precaution is not required when loading liquids which are nonaccumulators of static charges.

(e) Stray currents. Tank car loading facilities where Class I liquids are loaded through open domes shall be protected against stray currents by bonding the pipe to at least one rail and to the rack structure if of metal. Multiple lines entering the rack area shall be electrically bonded together. In addition, in areas where excessive stray currents are known to exist, all pipe entering the rack area shall be provided with insulating sections to electrically isolate the rack piping from the pipelines. No bonding between the tank car and the rack or piping is required during either loading or unloading of Class II or III liquids.

(f) Container filling facilities. Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of these standards shall be deemed to have been complied with.

(4) Wharves. (a) Definition, application. The term wharf shall mean any wharf, pier, bulkhead, or other structure over or contiguous to navigable water used in conjunction with a bulk plant, the primary function of which is the transfer of flammable or combustible liquid cargo in bulk between the bulk plant and any tank vessel, ship, barge, lighter boat, or other mobile floating craft; and this subparagraph shall apply to all such installations except Marine Service Stations as covered in WAC 296-24-33015.

(b) Package cargo. Package cargo of flammable and combustible liquids, including full and empty drums, bulk fuel, and stores may be handled over a wharf and at such times and places as may be agreed upon by the wharf superintendent and the senior deck officer on duty.

(c) Location. Wharves at which flammable or combustible liquid cargoes are to be transferred in bulk quantities to or from tank vessels shall be at least 100 feet from any bridge over a navigable waterway, or from an entrance to or superstructure of any vehicular or railroad tunnel under a waterway. The termination of the wharf loading or unloading fixed piping shall be at least 200 feet from a bridge or from an entrance to or superstructure of a tunnel.

(d) Design and construction. Substructure and deck shall be substantially designed for the use intended. Deck may employ any material which will afford the desired combination of flexibility, resistance to shock, durability, strength, and fire resistance. Heavy timber construction is acceptable.

(e) Tanks. Tanks used exclusively for ballast water or Class II or Class III liquids may be installed on suitably designed wharves.

(f) Pumps. Loading pumps capable of building up pressures in excess of the safe working pressure of cargo hose or loading arms shall be provided with bypasses, relief valves, or other arrangement to protect the loading facilities against excessive pressure. Relief devices shall be tested at not more than yearly intervals to determine that they function satisfactorily at the pressure at which they are set.

(g) Hoses and couplings. All pressure hoses and couplings shall be inspected at intervals appropriate to the service. The hose and couplings shall be tested with the hose extended and using the "inservice maximum operating pressures". Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings shall be withdrawn from service and repaired or discarded.

(h) Piping and fittings. Piping, valves, and fittings shall be in accordance with WAC 296-24-33007 with the following exceptions and additions:

(i) Flexibility of piping shall be assured by appropriate layout and arrangement of piping supports so that motion of the wharf structure resulting from wave action, currents, tides, or the mooring of vessels will not subject the pipe to repeated strain beyond the elastic limit.

(ii) Pipe joints depending upon the friction characteristics of combustible materials or grooving of pipe ends for mechanical continuity of piping shall not be used.

(iii) Swivel joints may be used in piping to which hoses are connected, and for articulated swivel-joint transfer systems, provided that the design is such that the mechanical strength of joint will not be impaired if the packing material should fail, as by exposure to fire.

(iv) Piping systems shall contain a sufficient number of valves to operate the system properly and to control the flow of liquid in normal operation and in the event of physical damage.

(v) In addition to the requirements of (4)(h)(iv), each line conveying flammable liquids leading to a wharf shall be provided with a readily accessible block valve located on shore near the approach to the wharf and outside of any diked area. Where more than one line is involved, the valves shall be grouped in one location.

(vi) Means of easy access shall be provided for cargo line valves located below the wharf deck.

(vii) Pipelines on flammable or combustible liquids wharves shall be adequately bonded and grounded. If excessive stray currents are encountered, insulating points shall be installed. Bonding and grounding connections on all pipelines shall be located on wharfside of hose-riser insulating flanges, if used, and shall be accessible for inspection.

(viii) Hose or articulated swivel-joint pipe connections used for cargo transfer shall be capable of accommodating the combined effects of change in draft and maximum tidal range, and mooring lines shall be kept adjusted to prevent the surge of the vessel from placing stress on the cargo transfer system.

(ix) Hose shall be supported so as to avoid kinking and damage from chafing.

(i) Fire protection. Suitable portable fire extinguishers with a rating of not less than 12-BC shall be located with 75 feet of those portions of the facility where fires are likely to occur, such as hose connections, pumps, and separator tanks.

(i) Where piped water is available, ready-connected fire hose in size appropriate for the water supply shall be provided so that manifolds where connections are made and broken can be reached by at least one hose stream.

(ii) Material shall not be placed on wharves in such a manner as to obstruct access to firefighting equipment, or important pipeline control valves.

(iii) Where the wharf is accessible to vehicle traffic, an unobstructed roadway to the shore end of the wharf shall be maintained for access of firefighting apparatus.

(j) Operations control. Loading or discharging shall not commence until the wharf superintendent and officer in charge of the tank vessel agree that the tank vessel is properly moored and all connections are properly made. Mechanical work shall not be performed on the wharf during cargo transfer, except under special authorization by a delegated person or his authorized representative based on a review of the area involved, methods to be employed, and precaution necessary.

(5) Electrical Equipment. (a) Application. This subsection shall apply to areas where Class I liquids are stored or handled. For areas where Class II or Class III liquids only are stored or handled, the electrical equipment may be installed in accordance with the provisions

of WAC 296-24-950 and WAC 296-24-955 for ordinary locations.

(b) Conformance. All electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with WAC 296-24-950 and WAC 296-24-955.

(c) Classification. So far as it applies Table H-18 shall be used to delineate and classify hazardous areas for the purpose of installation of electrical equipment under normal circumstances. In Table H-18 a classified area shall not extend beyond an unpierced wall, roof, or other solid partition. The area classifications listed shall be based on the premise that the installation meets the applicable requirements of this section in all respects.

TABLE H-18

ELECTRICAL EQUIPMENT HAZARDOUS AREAS—BULK PLANTS

Location	NEC Class I Group D division	Extent of classified area
Tank vehicle and tank car: ¹		
Loading through open dome _____	1	Within 3 feet of edge of dome, extending in all directions.
	2	Area between 3 feet and 5 feet from edge of dome, extending in all directions.
Loading through bottom connections with atmospheric venting. _____	1	Within 3 feet of point of venting to atmosphere, extending in all directions.
	2	Area between 3 feet and 5 feet from point of venting to atmosphere, extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of loading connection.
Loading through closed dome with atmospheric venting. _____	1	Within 3 feet of open end of vent, extending in all directions.
	2	Area between 3 feet and 5 feet from open end of vent, extending in all directions. Also within 3 feet of edge of dome, extending in all directions.
Loading through closed dome with vapor recovery. _____	2	Within 3 feet of point of connection of both fill and vapor lines, extending in all directions.

TABLE H-18

ELECTRICAL EQUIPMENT HAZARDOUS AREAS—BULK PLANTS

Location	NEC Class I Group D division	Extent of classified area
Bottom loading with vapor recovery or any bottom unloading. _____	2	Within 3 feet of point of connections extending in all directions. Also up to 18 inches above grade within a horizontal radius of 10 feet from point of connection.
Drum and container filling:		
Outdoors, or indoors with adequate ventilation. _____	1	Within 3 feet of vent and fill opening, extending in all directions.
	2	Area between 3 feet and 5 feet from vent or fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening.
Outdoors, or indoors with adequate ventilation _____	1	Within 3 feet of vent and fill opening, extending in all directions.
	2	Area between 3 feet and 5 feet from vent or fill opening, extending in all directions. Also up to 18 inches above floor or grade level within a horizontal radius of 10 feet from vent or fill opening.
Tank—Aboveground:		
Shell, ends, or roof and dike area _____	2	Within 10 feet from shell, ends, or roof of tank, Area inside dikes to level of top of dike.
Vent _____	1	Within 5 feet of open end of vent, extending in all directions.
	2	Area between 5 feet and 10 feet from open end of vent, extending in all directions.
Floating roof _____	1	Area above the roof and within the shell.
Pits:		
Without mechanical ventilation _____	1	Entire area within pit if any part is within a Division 1 or 2 classified area.
With mechanical ventilation _____	2	Entire area within pit if any part is within a Division 1 or 2 classified area.

TABLE H-18
ELECTRICAL EQUIPMENT HAZARDOUS
AREAS—BULK PLANTS

Location	NEC Class I Group D division	Extent of classified area
Containing valves, fittings or piping, and not within a division 1 or 2 classified area. _____	2	Entire pit.
Pumps, bleeders, withdrawal fittings, meters and similar devices:		
Indoors _____	2	Within 5 feet of any edge of such devices, extending in all directions. Also up to 3 feet above floor or grade level within 25 feet horizontally from any edge of such devices.
Outdoors _____	2	Within 3 feet of any edge of such devices, extending in all directions. Also up to 18 inches above grade level within 10 feet horizontally from any edge of such devices.
Storage and repair garage for tank vehicles _____	1	All pits or spaces below floor level.
	2	Area up to 18 inches above floor or grade level for entire storage or repair garage.
Drainage ditches, separators, impounding basins. _____	2	Area up to 18 inches above ditch, separator or basin. Also up to 18 inches above grade within 15 feet horizontally from any edge.
Garages for other than tank vehicles _____	Ordinary	If there is any opening to these rooms within the extent of an outdoor classified area, the entire room shall be classified the same as the area classification at the point of the opening.
Outdoor drum storage _____	Ordinary	
Indoor warehousing where there is no flammable liquid transfer. _____	Ordinary	If there is any opening to these rooms within the extent of an indoor classified area, the room shall be classified the same as if the wall, curb or partition did not exist.
Office and rest rooms _____	Ordinary	

¹When classifying the extent of the area, consideration shall be given to the fact that tank cars or tank vehicles may be spotted at varying points. Therefore, the extremities of the loading or unloading positions shall be used.

[Title 296 WAC—p 420]

(6) Sources of Ignition. Class I liquids shall not be handled, drawn, or dispensed where flammable vapors may reach a source of ignition. Smoking shall be prohibited except in designated localities. "No Smoking" signs shall be conspicuously posted where hazard from flammable liquid vapors is normally present.

(7) Drainage and Waste Disposal. Provision shall be made to prevent flammable or combustible liquids which may be spilled at loading or unloading points from entering public sewers and drainage systems, or natural waterways. Connection to such sewers, drains, or waterways by which flammable or combustible liquids might enter shall be provided with separator boxes or other approved means whereby such entry is precluded. Crankcase drainings and flammable or combustible liquids shall not be dumped into sewers, but shall be stored in tanks or tight drums outside of any building until removed from the premises.

(8) Fire Control. Suitable fire-control devices, such as small hose or portable fire extinguishers, shall be available to locations where fires are likely to occur. Additional fire-control equipment may be required where a tank of more than 50,000 gallons individual capacity contains Class I liquids and where an unusual exposure hazard exists from surrounding property. Such additional fire-control equipment shall be sufficient to extinguish a fire in the largest tank. The design and amount of such equipment shall be in accordance with approved engineering standards. [Order 76-6, § 296-24-33013, filed 3/1/76; Order 73-5, § 296-24-33013, filed 5/9/73 and Order 73-4, § 296-24-33013, filed 5/7/73.]

WAC 296-24-33015 Service stations. (1) Storage and Handling. (a) General provisions. (i) Liquids shall be stored in approved closed containers not exceeding 60 gallons capacity, in tanks located underground, in tanks in special enclosures as described in (1)(b) of this section, or in aboveground tanks as provided for in (4)(b)(i), (ii), (iii) and (iv) of this section.

(ii) Aboveground tanks, located in an adjoining bulk plant, may be connected by piping to service station underground tanks if, in addition to valves at aboveground tanks, a valve is also installed within control of service station personnel.

(iii) Apparatus dispensing Class I liquids into the fuel tanks of motor vehicles of the public shall not be located at a bulk plant unless separated by a fence or similar barrier from the area in which bulk operations are conducted.

(iv) The provisions of (1) of this section shall not prohibit the dispensing of flammable liquids in the open from a tank vehicle to a motor vehicle. Such dispensing shall be permitted provided:

(A) The tank vehicle complies with the requirements covered in the Standard on Tank Vehicles for Flammable Liquids, NFPA 385-1966.

(B) The dispensing is done on premises not open to the public.

(C) The dispensing hose does not exceed 50 feet in length.

(D) The dispensing nozzle is a listed automatic-closing type without a latch-open device.

(vi) Class I liquids shall not be stored or handled within a building having a basement or pit into which flammable vapors may travel, unless such area is provided with ventilation designed to prevent the accumulation of flammable vapors therein.

(vii) Accurate inventory records shall be maintained and reconciled on all Class I liquid storage tanks for possible indication of leakage from tanks or piping.

(b) Special enclosures. (i) When Installation of tanks in accordance with WAC 296-24-33005(3) is impractical because of property or building limitations, tanks for flammable or combustible liquids may be installed in buildings if properly enclosed.

(ii) The enclosure shall be substantially liquid and vaportight without backfill. Sides, top, and bottom of the enclosure shall be of reinforced concrete at least 6 inches thick, with openings for inspection through the top only. Tank connections shall be so piped or closed that neither vapors nor liquid can escape into the enclosed space. Means shall be provided whereby portable equipment may be employed to discharge to the outside any liquid or vapors which might accumulate should leakage occur.

(iii) At automotive service stations provided in connection with tenant or customer parking facilities at or below grade level in large buildings of commercial, mercantile, or residential occupancy, tanks containing Class I liquids, installed of necessity in accordance with (1)(b)(ii) of this section, shall not exceed 6,000 gallons individual or 18,000 gallons aggregate capacity.

(c) Inside buildings. (i) Except where stored in tanks as provided in (1)(b) of this section, no Class I liquids shall be stored within any service station building except in closed containers of aggregate capacity not exceeding 60 gallons. One container not exceeding 60 gallons capacity equipped with an approved pump is permitted.

(ii) Class I liquids may be transferred from one container to another in lubrication or service rooms of a service station building provided the electrical installation complies with Table H-19 and provided that any heating equipment complies with (6) of this section.

(iii) Class II and Class III liquids may be stored and dispensed inside service station buildings from tanks of not more than 120 gallons capacity each.

(d) Labeling. No sale or purchase of any Class I, II, or III liquids shall be made in containers unless such containers are clearly marked with the name of the product contained therein.

(e) Dispensing into portable containers. No delivery of any Class I liquids shall be made into portable containers unless the container is constructed of metal, has a tight closure with screwed or spring cover, and is fitted with a spout or so designed that the contents can be poured without spilling.

(2) Private Stations. Service stations not accessible to or open to the public do not require an attendant or supervisor. Such stations may be used by commercial, industrial, governmental, or manufacturing establishments.

(3) Dispensing Systems. (a) Location. Dispensing devices at automotive service stations shall be so located that all parts of the vehicle being served will be on the premises of the service station.

(b) Inside location. Approved dispensing units may be located inside of buildings. The dispensing area shall be separated from other areas in an approved manner. The dispensing unit and its piping shall be mounted either on a concrete island or protected against collision damage by suitable means and shall be located in a position where it cannot be struck by a vehicle descending a ramp or other slope out of control. The dispensing area shall be provided with an approved mechanical or gravity ventilation system. When dispensing units are located below grade, only approved mechanical ventilation shall be used and the entire dispensing area shall be protected by an approved automatic sprinkler system. Ventilating systems shall be electrically interlocked with gasoline dispensing units so that the dispensing units cannot be operated unless the ventilating fan motors are energized.

(c) Emergency power cutoff. A clearly identified and easily accessible switch(es) or a circuit breaker(s) shall be provided at a location remote from dispensing devices, including remote pumping systems, to shut off the power to all dispensing devices in the event of an emergency.

(d) Dispensing units. (i) Class I liquids shall be transferred from tanks by means of fixed pumps so designed and equipped as to allow control of the flow and to prevent leakage or accidental discharge.

(ii) Only listed devices may be used for dispensing Class I liquids. No such device may be used if it shows evidence of having been dismantled.

(iii) Every dispensing device for Class I liquids installed after December 31, 1978, shall contain evidence of listing so placed that any attempt to dismantle the device will result in damage to such evidence, visible without disassembly or dismantling of the nozzle.

(iv) Class I liquids shall not be dispensed by pressure from drums, barrels, and similar containers. Approved pumps taking suction through the top of the container or approved self-closing faucets shall be used.

(v) The dispensing units, except those attached to containers, shall be mounted either on a concrete island or protected against collision damage by suitable means.

(c) Remote pumping systems. (i) This subdivision shall apply to systems for dispensing Class I liquids where such liquids are transferred from storage to individual or multiple dispensing units by pumps located elsewhere than at the dispensing units.

(ii) Pumps shall be designed or equipped so that no part of the system will be subjected to pressures above its allowable working pressure. Pumps installed above grade, outside of buildings, shall be located not less than 10 feet from lines of adjoining property which is/or may be built upon, and not less than 5 feet from any building opening. When an outside pump location is impractical, pumps may be installed inside of buildings, as provided for dispensers in (3)(b) of this section, or in pits as provided in (3)(c)(iii) of this section. Pumps shall be substantially anchored and protected against physical damage by vehicles.

(iii) Pits for subsurface pumps or piping manifolds of submersible pumps shall withstand the external forces to which they may be subjected without damage to the pump, tank, or piping. The pit shall be no larger than

necessary for inspection and maintenance and shall be provided with a fitted cover.

(iv) A control shall be provided that will permit the pump to operate only when a dispensing nozzle is removed from its bracket on the dispensing unit and the switch on this dispensing unit is manually actuated. This control shall also stop the pump when all nozzles have been returned to their brackets.

(v) An approved impact valve, incorporating a fusible link, designed to close automatically in the event of severe impact or fire exposure shall be properly installed in the dispensing supply line at the base of each individual dispensing device.

(vi) Testing. After the completion of the installation, including any paving, that section of the pressure piping system between the pump discharge and the connection for the dispensing facility shall be tested for at least 30 minutes at the maximum operating pressure of the system. Such tests shall be repeated at 5-year intervals thereafter.

(f) Delivery nozzles. (i) Hose-nozzle valves of either the manual or automatic-closing type for dispensing class I liquids into a fuel tank or into a container shall be manually held open during the dispensing operation except as provided in (3)(f)(ii).

(ii) On any service station dispenser accessible to the public a listed automatic type nozzle with hold-open latch is permitted only when all dispensing of Class I liquids is to be done by the service station attendant.

(iii) If the dispensing of Class I liquids at a service station available and open to the public is to be done by a person other than the service station attendant, the nozzle shall be a listed automatic-closing type without a hold-open latch.

(g) Special type dispensers. (i) Emergency controls shall be installed at an acceptable location, but controls shall not be more than 100 feet from dispensers.

(ii) Instructions for the operation of dispensers shall be conspicuously posted.

(4) Marine Service Stations. (a) Dispensing. (i) The dispensing area shall be located away from other structures so as to provide room for safe ingress and egress of craft to be fueled. Dispensing units shall in all cases be at least 20 feet from any activity involving fixed sources of ignition.

(ii) Dispensing shall be by approved dispensing units with or without integral pumps and may be located on open piers, wharves, or floating docks or on shore or on piers of the solid fill type.

(iii) Dispensing nozzles shall be automatic-closing without a hold-open latch.

(b) Tanks and pumps. (i) Tanks, and pumps not integral with the dispensing unit, shall be on shore or on a

pier of the solid fill type, except as provided in (4)(b)(ii) and (iii) of this section.

(ii) Where shore location would require excessively long supply lines to dispensers, tanks may be installed on a pier provided that applicable portions of WAC 296-24-33005 relative to spacing, diking, and piping are complied with and the quantity so stored does not exceed 1,100 gallons aggregate capacity.

(iii) Shore tanks supplying marine service stations may be located above ground, where rock ledges or high water table make underground tanks impractical.

(iv) Where tanks are at an elevation which would produce gravity head on the dispensing unit, the tank outlet shall be equipped with a pressure control valve positioned adjacent to and outside the tank block valve specified in WAC 296-24-33005(2)(h)(ii) of this section, so adjusted that liquid cannot flow by gravity from the tank in case of piping or hose failure.

(c) Piping. (i) Piping between shore tanks and dispensing units shall be as described in WAC 296-24-33007, except that, where dispensing is from a floating structure, suitable lengths of oil-resistant flexible hose may be employed between the shore piping and the piping on the floating structure as made necessary by change in water level or shoreline.

(ii) A readily accessible valve to shut off the supply from shore shall be provided in each pipeline at or near the approach to the pier and at the shore end of each pipeline adjacent to the point where flexible hose is attached.

(iii) Piping shall be located so as to be protected from physical damage.

(iv) Piping handling Class I liquids shall be grounded to control stray currents.

(5) Electrical Equipment. (a) Application. This subsection shall apply to areas where Class I liquids are stored or handled. For areas where Class II or Class III liquids are stored or handled the electrical equipment may be installed in accordance with the provisions of WAC 296-24-950 and WAC 296-24-955 for ordinary locations.

(b) All electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with WAC 296-24-950 and WAC 296-24-955.

(c) So far as it applies, Table H-19 shall be used to delineate and classify hazardous areas for the purpose of installation of electrical equipment under normal circumstances. A classified area shall not extend beyond an unpierced wall, roof, or other solid partition.

(d) The area classifications listed shall be based on the assumption that the installation meets the applicable requirements of this section in all respects.

TABLE H-19

ELECTRICAL EQUIPMENT HAZARDOUS AREAS—SERVICE STATIONS

Location	NEC Class 1, Group D division	Extent of classified area
Underground tank:		
Fill opening	1	Any pit, box or space below grade level, any part of which is within the Division 1 or 2 classified area.
	2	Up to 18 inches above grade level within a horizontal radius of 10 feet from a loose fill connection and within a horizontal radius of 5 feet from a tight fill connection.
Vent—Discharging upward	1	Within 3 feet of open end of vent, extending in all directions.
	2	Area between 3 feet and 5 feet of open end of vent, extending in all directions.
Dispenser:		
Pits	1	Any pit, box or space below grade level, any part of which is within the Division 1 or 2 classified area.
Dispenser enclosure	1	The area 4 feet vertically above base within the enclosure and 18 inches horizontally in all directions.
Outdoor	2	Up to 18 inches above grade level within 20 feet horizontally of any edge of enclosure.
Indoor:		
With mechanical ventilation	2	Up to 18 inches above grade or floor level within 20 feet horizontally of any edge of enclosure.
With gravity ventilation	2	Up to 18 inches above grade or floor level within 25 feet horizontally of any edge of enclosure.
Remote pump—Outdoor	1	Any pit, box or space below grade level if any part is within a horizontal distance of 10 feet from any edge of pump.
	2	Within 3 feet of any edge of pump, extending in all directions. Also up to 18 inches above grade level within 10 feet horizontally from any edge of pump.

TABLE H-19

ELECTRICAL EQUIPMENT HAZARDOUS AREAS—SERVICE STATIONS

Location	NEC Class 1, Group D division	Extent of classified area
Remote pump—Indoor	1	Entire area within any pit. Within 5 feet of any edge of pump, extending in all directions. Also up to 3 feet above floor or grade level within 25 feet horizontally from any edge of pump.
	2	
Lubrication or service room	1	Entire area within any pit. Area up to 18 inches above floor or grade level within entire lubrication room.
	2	
Dispenser for Class I Liquids	2	Within 3 feet of any fill or dispensing point, extending in all directions.
Special enclosure inside building per WAC 296-24-33013(1)(b).	1	Entire enclosure.
Sales, storage and rest rooms	Ordinary	If there is any opening to these rooms within the extent of a Division 1 area, the entire room shall be classified as Division 1.

(6) Heating Equipment. (a) Conformance. Heating equipment shall be installed as provided in (6)(b) through (e) of this section.

(b) Application. Heating equipment may be installed in the conventional manner in an area except as provided in (6)(c), (d) or (e) of this section.

(c) Special room. Heating equipment may be installed in a special room separated from an area classified by Table H-19 by walls having a fire resistance rating of at least 1 hour and without any openings in the walls within 8 feet of the floor into an area classified in Table H-19. This room shall not be used for combustible storage and all air for combustion purposes shall come from outside the building.

(d) Work areas. Heating equipment using gas or oil fuel may be installed in the lubrication, sales, or service room where there is no dispensing or transferring of Class I liquids provided the bottom of the combustion chamber is at least 18 inches above the floor and the heating equipment is protected from physical damage by vehicles. Heating equipment using gas or oil fuel listed for use in garages may be installed in the lubrication or service room where Class I liquids are dispensed provided the equipment is installed at least 8 feet above the floor.

(e) Electric heat. Electrical heating equipment shall conform to (5) of this section.

(7) Drainage and Waste Disposal. Provision shall be made in the area where Class I liquids are dispensed to prevent spilled liquids from flowing into the interior of service station buildings. Such provision may be by grading driveways, raising door sills, or other equally effective means. Crankcase drainings and flammable or combustible liquids shall not be dumped into sewers but shall be stored in tanks or drums outside of any building until removed from the premises.

(8) Sources of Ignition. In addition to the previous restrictions of this section, the following shall apply: 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. Conspicuous and legible signs prohibiting smoking shall be posted within sight of the customer being served. The motors of all equipment being fueled shall be shut off during the fueling operation.

(9) Fire Control. Each service station shall be provided with at least one fire extinguisher having a minimum approved classification of 6 B, C located so that an extinguisher will be within 75 feet of each pump, dispenser, underground fill pipe opening, and lubrication or service room. [Order 76-6, § 296-24-33015, filed 3/1/76; Order 73-5, § 296-24-33015, filed 5/9/73 and Order 73-4, § 296-24-33015, filed 5/7/73.]

WAC 296-24-33017 Processing plants. (1) Scope. This section shall apply to those plants or buildings which contain chemical operations such as oxidation, reduction, halogenation, hydrogenation, alkylation, polymerization, and other chemical processes but shall not apply to chemical plants, refineries or distilleries.

(2) Location. (a) Classification. The location of each processing vessel shall be based upon its flammable or combustible liquid capacity. Processing vessels shall be located, with respect to distances to lines of adjoining property which may be built upon, in accordance with Table H-20, except when the processing plant is designed in accordance with (2)(b) of this section.

TABLE H-20

Processing vessels with emergency relief venting to permit pressure	Stable liquids	Unstable liquids
Not in excess of 2.5 p.s.i.g.	Table H-9	2 1/2 times Table H-9.
Over 2.5. p.s.i.g.	1 1/2 times Table H-9.	4 times Table H-9.

(b) Exception. The distances required in (2)(a) of this section may be waived when the vessels are housed within a building and the exterior wall facing the line of

adjoining property which may be built upon is a blank wall having a fire-resistance rating of not less than 4 hours. When Class IA or unstable liquids are handled, the blank wall shall have explosion resistance in accordance with good engineering practice, see (3)(d) of this section.

(3) Processing Building. (a) Construction. (i) Processing buildings shall be of fire-resistance or noncombustible construction, except heavy timber construction with load-bearing walls may be permitted for plants utilizing only stable Class II or Class III liquids. Except as provided in (2)(b) of this section or in the case of explosion resistant walls used in conjunction with explosion relieving facilities, see (3)(d) of this section, loadbearing walls are prohibited. Buildings shall be without basements or covered pits.

(ii) Areas shall have adequate exit facilities arranged to prevent occupants from being trapped in the event of fire. Exits shall not be exposed by the drainage facilities described in (3)(b) of this section.

(b) Drainage. (i) Emergency drainage systems shall be provided to direct flammable or combustible liquid leakage and fire protection water to a safe location. This may require curbs, scuppers, or special drainage systems to control the spread of fire, see WAC 296-24-33005(2)(g)(ii).

(ii) Emergency drainage systems, if connected to public sewers or discharged into public waterways, shall be equipped with traps or separators.

(iii) The processing plant shall be designed and operated to prevent the normal discharge of flammable or combustible liquids to public waterways, public sewers, or adjoining property.

(c) Ventilation. (i) Enclosed processing buildings shall be ventilated at a rate of not less than 1 cubic foot per minute per square foot of solid floor area. This shall be accomplished by natural or mechanical ventilation with discharge or exhaust to a safe location outside of the building. Provision shall be made for introduction of makeup air in such a manner as not to short circuit the ventilation. Ventilation shall be arranged to include all floor areas or pits where flammable vapors may collect.

(ii) Equipment used in a building and the ventilation of the building shall be designed so as to limit flammable vapor-air mixtures under normal operating conditions to the interior of equipment, and to not more than 5 feet from equipment which exposes Class I liquids to the air. Examples of such equipment are dispensing stations, open centrifuges, plate and frame filters, open vacuum filters, and surfaces of open equipment.

(d) Explosion relief. Areas where Class IA or unstable liquids are processed shall have explosion venting through one or more of the following methods:

- (i) Open air construction.
- (ii) Lightweight walls and roof.
- (iii) Lightweight wall panels and roof hatches.
- (iv) Windows of explosion venting type.

(4) Liquid Handling. (a) Storage. (i) The storage of flammable or combustible liquids in tanks shall be in accordance with the applicable provisions of WAC 296-24-33005.

(ii) If the storage of flammable or combustible liquids in outside aboveground or underground tanks is not practical because of temperature or production considerations, tanks may be permitted inside of buildings or structures in accordance with the applicable provisions of WAC 296-24-33005.

(iii) Storage tanks inside of buildings shall be permitted only in areas at or above grade which have adequate drainage and are separated from the processing area by construction having a fire resistance rating of at least 2 hours.

(iv) The storage of flammable or combustible liquids in containers shall be in accordance with the applicable provisions of WAC 296-24-33009.

(b) Piping, valves, and fittings. (i) Piping, valves, and fittings shall be in accordance with WAC 296-24-33007.

(ii) Approved flexible connectors may be used where vibration exists or where frequent movement is necessary. Approved hose may be used at transfer stations.

(iii) Piping containing flammable or combustible liquids shall be identified.

(c) Transfer. (i) The transfer of large quantities of flammable or combustible liquids shall be through piping by means of pumps or water displacement. Except as required in process equipment, gravity flow shall not be used. The use of compressed air as a transferring medium is prohibited.

(ii) Positive displacement pumps shall be provided with pressure relief discharging back to the tank or to pump suction.

(d) Equipment. (i) Equipment shall be designed and arranged to prevent the unintentional escape of liquids and vapors and to minimize the quantity escaping in the event of accidental release.

(ii) Where the vapor space of equipment is usually within the flammable range, the probability of explosion damage to the equipment can be limited by inerting, by providing an explosion suppression system, or by designing the equipment to contain the peak explosion pressure which may be modified by explosion relief. Where the special hazards of operation, sources of ignition, or exposures indicate a need, consideration shall be given to providing protection by one or more of the above means.

(5) Tank Vehicle and Tank Car Loading and Unloading. Tank vehicle and tank car loading or unloading facilities shall be separated from aboveground tanks, warehouses, other plant buildings, or nearest line of adjoining property which may be built upon by a distance of 25 feet for Class I liquids and 15 feet for Class II and Class III liquids measured from the nearest position of any fill stem. Buildings for pumps or shelters for personnel may be a part of the facility. Operations of the facility shall comply with the appropriate portions of WAC 296-24-33013(3).

(6) Fire Control. (a) Portable extinguishers. Approved portable fire extinguishers of appropriate size, type and number shall be provided.

(b) Other controls. Where the special hazards of operation or exposure indicate a need, the following fire control provision shall be provided.

(i) A reliable water supply shall be available in pressure and quantity adequate to meet the probable fire demands.

(ii) Hydrants shall be provided in accordance with accepted good practice.

(iii) Hose connected to a source of water shall be installed so that all vessels, pumps, and other equipment containing flammable or combustible liquids can be reached with at least one hose stream. Nozzles that are capable of discharging a water spray shall be provided.

(iv) Processing plants shall be protected by an approved automatic sprinkler system or equivalent extinguishing system. If special extinguishing systems including but not limited to those employing foam, carbon dioxide, or dry chemical are provided, approved equipment shall be used and installed in an approved manner.

(c) Alarm systems. An approved means for prompt notification of fire to those within the plant and any public fire department available shall be provided. It may be advisable to connect the plant system with the public system where public fire alarm system is available.

(d) Maintenance. All plant fire protection facilities shall be adequately maintained and periodically inspected and tested to make sure they are always in satisfactory operating condition and that they will serve their purpose in time of emergency.

(7) Sources of Ignition. (a) General. (i) Precautions shall be taken to prevent the ignition of flammable vapors. Sources of ignition include but are not limited to open flames; lightning; smoking; cutting and welding; hot surfaces; frictional heat; static, electrical, any mechanical sparks; spontaneous ignition, including heat-producing chemical reactions; and radiant heat.

(ii) Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of this section shall be deemed to have been complied with.

(b) Maintenance and repair. (i) When necessary to do maintenance work in a flammable or combustible liquid processing area, the work shall be authorized by a responsible representative of the employer.

(ii) Hot work such as welding or cutting operations, use of spark-producing power tools, and chipping operations shall be permitted only under supervision of an individual in responsible charge who shall make an inspection of the area to be sure that it is safe for the work to be done and that safe procedures will be followed for the work specified.

(c) Electrical. (i) All electrical wiring and equipment within storage or processing areas shall be installed in accordance with nationally recognized good practice.

(ii) Locations where flammable vapor-air mixtures may exist under normal operations shall be classified Class I, Division 1 according to the requirements of WAC 296-24-950 and WAC 296-24-955. For those pieces of equipment installed in accordance with

(3)(c)(ii) of this section, the Division 1 area shall extend 5 feet in all directions from all points of vapor liberation. All areas within pits shall be classified Division 1 if any part of the pit is within a Division 1 or 2 classified area, unless the pit is provided with mechanical ventilation.

(iii) Locations where flammable vapor-air mixtures may exist under abnormal conditions and for a distance beyond Division 1 locations shall be classified Division 2 according to the requirements of WAC 296-24-950 and WAC 296-24-955. These locations include an area within 20 feet horizontally, 3 feet vertically beyond a Division 1 area, and up to 3 feet above floor or grade level within 25 feet, if indoors, or 10 feet if outdoors, from any pump, bleeder, withdrawal fittings, meter, or similar device handling Class I liquids. Pits provided with adequate mechanical ventilation within a Division 1 or 2 area shall be classified Division 2. If Class II or Class III liquids only are handled, then ordinary electrical equipment is satisfactory though care shall be used in locating electrical apparatus to prevent hot metal from falling into open equipment.

(iv) Where the provisions of (7)(c)(i), (ii), and (iii) of this section require the installation of explosion-proof equipment, ordinary electrical equipment including switchgear may be used if installed in a room or enclosure which is maintained under positive pressure with respect to the hazardous area. Ventilation makeup air shall be uncontaminated by flammable vapors.

(8) Housekeeping. (a) General. Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.

(b) Access. Adequate aisles shall be maintained for unobstructed movement of personnel and so that fire protection equipment can be brought to bear on any part of the processing equipment.

(c) Waste and residues. Combustible waste material and residues in a building or operating area shall be kept to a minimum, stored in closed metal waste cans, and disposed of daily.

(d) Clear zone. Ground area around buildings and operating areas shall be kept free of tall grass, weeds, trash, or other combustible materials. [Order 76-6, § 296-24-33017, filed 3/1/76; Order 73-5, § 296-24-33017, filed 5/9/73 and Order 73-4, § 296-24-33017, filed 5/7/73.]

WAC 296-24-33019 Refineries, chemical plants, and distilleries. (1) Storage Tanks. Flammable or combustible liquids shall be stored in tanks, in containers, or in portable tanks. Tanks shall be installed in accordance with WAC 296-24-33005. Tanks for the storage of flammable or combustible liquids in tank farms and in locations other than process areas shall be located in accordance with WAC 296-24-33005(2)(a) and (b).

(2) Wharves. Wharves handling flammable or combustible liquids shall be in accordance with WAC 296-24-33013(4).

(3) Fired and Unfired Pressure Vessels. (a) Fired vessels. Fired pressure vessels shall be constructed in accordance with the Code for Fired Pressure Vessels,

section I of the ASME Boiler and Pressure Vessel Code—1968.

(b) Unfired vessels shall be constructed in accordance with the Code for Unfired Pressure Vessels, section VIII of the ASME Boiler and Pressure Vessel Code—1968.

(4) Location of Process Units. Process units shall be located so that they are accessible from at least one side for the purpose of fire control. Where topographical conditions are such that flammable or combustible liquids may flow from a processing area so as to constitute a fire hazard to property of others, provision shall be made to divert or impound the flow by curbs, drains, or other suitable means.

(5) Fire Control. (a) Portable equipment. Portable fire extinguishment and control equipment shall be provided in such quantities and types as are needed for the special hazards of operation and storage.

(b) Water supply. Water shall be available in volume and at adequate pressure to supply water hose streams, foam producing equipment, automatic sprinklers, or water spray systems as the need is indicated by the special hazards of operation and storage.

(c) Special equipment. Special extinguishing equipment such as that utilizing foam, inert gas, or dry chemical shall be provided as the need is indicated by the special hazards of operation and storage. [Order 73-5, § 296-24-33019, filed 5/9/73 and Order 73-4, § 296-24-33019, filed 5/7/73.]

WAC 296-24-370 Spray finishing using flammable and combustible materials. [Order 73-5, § 296-24-370, filed 5/9/73 and Order 73-4, § 296-24-370, filed 5/7/73.]

WAC 296-24-37001 Definitions. (1) Aerated Solid Powders. Aerated powders shall mean any powdered material used as a coating material which shall be fluidized within a container by passing air uniformly from below. It is common practice to fluidize such materials to form a fluidized powder bed and then dip the part to be coated into the bed in a manner similar to that used in liquid dipping. Such beds are also used as sources for powder spray operations.

(2) Spraying Area. Any area in which dangerous quantities of flammable vapors or mists, or combustible residues, dusts, or deposits are present due to the operation of spraying processes.

(3) Spray Booth. A power-ventilated structure provided to enclose or accommodate a spraying operation to confine and limit the escape of spray, vapor, and residue, and to safely conduct or direct them to an exhaust system.

(4) Waterwash Spray Booth. A spray booth equipped with a water washing system designed to minimize dusts or residues entering exhaust ducts and to permit the recovery of overspray finishing material.

(5) Dry Spray Booth. A spray booth not equipped with a water washing system as described in (4) of this section. A dry spray booth may be equipped with (a) distribution or baffle plates to promote an even flow of air through the booth or cause the deposit of overspray before it enters the exhaust duct; or (b) overspray dry

filters to minimize dusts; or (c) overspray dry filters to minimize dusts or residues entering exhaust ducts; or (d) overspray dry filter rolls designed to minimize dusts or residues entering exhaust ducts; or (e) where dry powders are being sprayed, with powder collection systems so arranged in the exhaust to capture oversprayed material.

(6) Fluidized Bed. A container holding powder coating material which is aerated from below so as to form an air-supported expanded cloud of such material through which the preheated object to be coated is immersed and transported.

(7) Electrostatic Fluidized Bed. A container holding powder coating material which is aerated from below so as to form an air-supported expanded cloud of such material which is electrically charged with a charge opposite to the charge of the object to be coated; such object is transported through the container immediately above the charged and aerated materials in order to be coated.

(8) Approved. Shall mean approved and listed by the following nationally recognized testing laboratories: Underwriters Laboratories, Inc.; Factory Mutual Engineering Corp.

(9) Listed. See "approved" in WAC 296-24-37001(8). [Order 76-6, § 296-24-37001, filed 3/1/76; Order 73-5, § 296-24-37001, filed 5/9/73 and Order 73-4, § 296-24-37001, filed 5/7/73.]

WAC 296-24-37003 Spray booths. (1) Construction. Spray booths shall be substantially constructed of steel, securely and rigidly supported, or of concrete or masonry except that aluminum or other substantial noncombustible material may be used for intermittent or low volume spraying. Spray booths shall be designed to sweep air currents toward the exhaust outlet.

(2) Interiors. The interior surfaces of spray booths shall be smooth and continuous without edges and otherwise designed to prevent pocketing of residues and facilitate cleaning and washing without injury.

(3) Floors. The floor surface of a spray booth and operator's working area, if combustible, shall be covered with noncombustible material of such character as to facilitate the safe cleaning and removal of residues.

(4) Distribution or Baffle Plates. Distribution or baffle plates, if installed to promote an even flow of air through the booth or cause the deposit of overspray before it enters the exhaust duct, shall be of noncombustible material and readily removable or accessible on both sides for cleaning. Such plates shall not be located in exhaust ducts.

(5) Dry Type Overspray Collectors—(Exhaust Air Filters). In conventional dry type spray booths, overspray dry filters or filter rolls, if installed, shall conform to the following:

(a) The spraying operations except electrostatic spraying operations shall be so designed, installed and maintained that the average air velocity over the open face of the booth (or booth cross section during spraying operations) shall be not less than 100 linear feet per minute. Electrostatic spraying operations may be conducted with an air velocity over the open face of the booth of not less than 60 linear feet per minute, or more,

depending on the volume of the finishing material being applied and its flammability and explosion characteristics. Visible gauges or audible alarm or pressure activated devices shall be installed to indicate or insure that the required air velocity is maintained. Dry spray booths equipped with a filter roll which is automatically advanced when the air velocity is reduced to that specified in this section should be arranged to cause shutdown of spraying operations if the filter roll fails to advance automatically. Maintenance procedures should be established to assure replacing filter pads before excessive restriction to airflow occurs. Filter pads should be inspected after each period of use and clogged filter pads discarded and replaced. Filter rolls shall be inspected to insure proper replacement of filter media.

(b) All discarded filter pads and filter rolls shall be immediately removed to a safe, well-detached location or placed in a water-filled metal container and disposed of at the close of the day's operation unless maintained completely in water.

(c) The location of filters in a spray booth shall be so as to not reduce the effective booth enclosure of the articles being sprayed.

(d) Space within the spray booth on the downstream and upstream sides of filters shall be protected with approved automatic sprinklers.

(e) Filters or filter rolls shall not be used when applying a spray material known to be highly susceptible to spontaneous heating and ignition.

(f) Clean filters or filter rolls shall be noncombustible or of a type having a combustibility not in excess of class 2 filters as listed by Underwriters' Laboratories, INC. Filters and filter rolls shall not be alternately used for different types of coating materials, where the combination of materials may be conducive to spontaneous ignition. See also WAC 296-24-37013(6).

(6) Frontal Area. Each spray booth having a frontal area larger than 9 square feet shall have a metal deflector or curtain not less than 2 1/2 inches deep installed at the upper outer edge of the booth over the opening.

(7) Conveyors. Where conveyors are arranged to carry work into or out of spray booths, the openings therefor shall be as small as practical.

(8) Separation of Operations. Each spray booth shall be separated from other operations by not less than 3 feet, or by a greater distance, or by such partition or wall as to reduce the danger from juxtaposition of hazardous operations. See also WAC 296-24-37005(1).

(9) Cleaning. Spray booths shall be so installed that all portions are readily accessible for cleaning. A clear space of not less than 3 feet on all sides shall be kept free from storage or combustible construction.

(10) Illumination. When spraying areas are illuminated through glass panels or other transparent materials, only fixed lighting units shall be used as a source of illumination. Panels shall effectively isolate the spraying area from the area in which the lighting unit is located, and shall be of a noncombustible material of such a nature or so protected that breakage will be unlikely. Panels shall be so arranged that normal accumulations of residue on the exposed surface of the panel will not be

raised to a dangerous temperature by radiation or conduction from the source of illumination. [Order 76-6, § 296-24-37003, filed 3/1/76; Order 73-5, § 296-24-37003, filed 5/9/73 and Order 73-4, § 296-24-37003, filed 5/7/73.]

WAC 296-24-37005 Electrical and other sources of ignition. (1) Conformance. All electrical equipment, open flames and other sources of ignition shall conform to the requirements of this section, except as follows:

(a) Electrostatic apparatus shall conform to the requirements of WAC 296-24-37015 and WAC 296-24-37017.

(b) Drying, curing, and fusion apparatus shall conform to the requirements of WAC 296-24-37019.

(c) Automobile undercoating spray operations in garages shall conform to the requirements of WAC 296-24-37021.

(d) Powder coating equipment shall conform to the requirements of WAC 296-24-37023.

(2) Minimum Separation. There shall be no open flame or spark producing equipment in any spraying area nor within 20 feet thereof, unless separated by a partition.

(3) Hot Surfaces. Space-heating appliances, steam-pipes, or hot surfaces shall not be located in a spraying area where deposits of combustible residues may readily accumulate.

(4) Wiring Conformance. Electrical wiring and equipment shall conform to the provisions of this section and shall otherwise be in accordance with WAC 296-24-950 and WAC 296-24-955.

(5) Combustible Residues, Areas. Unless specifically approved for locations containing both deposits of readily ignitable residue and explosive vapors, there shall be no electrical equipment in any spraying area, whereon deposits of combustible residues may readily accumulate, except wiring in rigid conduit or in boxes or fittings containing no taps, splices, or terminal connections.

(6) Wiring Type Approved. Electrical wiring and equipment not subject to deposits of combustible residues but located in a spraying area as herein defined shall be of explosion-proof type approved for class I, group D locations and shall otherwise conform to the provisions of WAC 296-24-950 and WAC 296-24-955, for Class I, Division 1, Hazardous Locations. Electrical wiring, motors, and other equipment outside of but within twenty (20) feet of any spraying area, and not separated therefrom by partitions, shall not produce sparks under normal operating conditions and shall otherwise conform to the provisions of WAC 296-24-950 and WAC 296-24-955 for Class I, Division 2 Hazardous Locations.

(7) Lamps. Electric lamps outside of, but within twenty (20) feet of any spraying area, and not separated therefrom by a partition, shall be totally enclosed to prevent the falling of hot particles and shall be protected from mechanical injury by suitable guards or by location.

(8) Portable Lamps. Portable electric lamps shall not be used in any spraying area during spraying operations.

Portable electric lamps, if used during cleaning or repairing operations, shall be of the type approved for hazardous class I locations.

(9) Grounding. (a) All metal parts of spray booths, exhaust ducts, and piping systems conveying flammable or combustible liquids or aerated solids shall be properly electrically grounded in an effective and permanent manner.

(b) "Airless" high-fluid pressure spray guns and any conductive object being sprayed should be properly electrically grounded. [Order 76-6, § 296-24-37005, filed 3/1/76; Order 73-5, § 296-24-37005, filed 5/9/73 and Order 73-4, § 296-24-37005, filed 5/7/73.]

WAC 296-24-37007 Ventilation. (1) Conformance. Ventilating and exhaust systems shall be in accordance with the Standard for Blower and Exhaust Systems for Vapor Removal, NFPA No. 91-1961, where applicable and shall also conform to the provisions of this section.

(2) General. All spraying areas shall be provided with mechanical ventilation adequate to remove flammable vapors, mists or powders to a safe location and to confine and control combustible residues so that life is not endangered. Mechanical ventilation shall be kept in operation at all times while spraying operations are being conducted and for a sufficient time thereafter to allow vapors from drying coated articles and drying finishing material residue to be exhausted.

(3) Independent Exhaust. Each spray booth shall have an independent exhaust duct system discharging to the exterior of the building, except that multiple cabinet spray booths in which identical spray finishing material is used with a combined frontal area of not more than 18 square feet may have a common exhaust. If more than one fan serves one booth, all fans shall be so interconnected that one fan cannot operate without all fans being operated.

(4) Fan-rotating Element. The fan-rotating element shall be nonferrous or nonsparking or the casing shall consist of or be lined with such material. There shall be ample clearance between the fan-rotating element and the fan casing to avoid a fire by friction, necessary allowance being made for ordinary expansion and loading to prevent contact between moving parts and the duct or fan housing. Fan blades shall be mounted on a shaft sufficiently heavy to maintain perfect alignment even when the blades of the fan are heavily loaded, the shaft preferably to have bearings outside the duct and booth. All bearings shall be of the self-lubricating type, or lubricated from the outside duct.

(5) Electric Motors. Electric motors driving exhaust fans shall not be placed inside booths or ducts. See also WAC 296-24-37005.

(6) Belts. Belts shall not enter the duct or booth unless the belt and pulley within the duct or booth are thoroughly enclosed.

(7) Exhaust Ducts. Exhaust ducts shall be constructed of steel and shall be substantially supported. Exhaust ducts without dampers are preferred; however, if dampers are installed, they shall be maintained so that they will be in a full open position at all times the ventilating system is in operation.

(a) Exhaust ducts shall be protected against mechanical damage and have a clearance from unprotected combustible construction or other combustible material of not less than 18 inches.

(b) If combustible construction is provided with the following protection applied to all surfaces within 18 inches, clearances may be reduced to the distances indicated:

- (i) 28-gage sheet metal on 1/4-inch 12 inches asbestos mill board.
- (ii) 28-gage sheet metal on 1/8-inch 9 inches asbestos mill board spaced out 1 inch on noncombustible spacers.
- (iii) 22-gage sheet metal on 1-inch 3 inches rockwool batts reinforced with wire mesh or the equivalent.
- (iv) Where ducts are protected with an approved automatic sprinkler system, properly maintained, the clearance required in (7)(a) of this section may be reduced to 6 inches.

(8) Discharge Clearance. Unless the spray booth exhaust duct terminal is from a water-wash spray booth, the terminal discharge point shall be not less than 6 feet from any combustible exterior wall or roof nor discharge in the direction of any combustible construction or unprotected opening in any noncombustible exterior wall within 25 feet.

(9) Air Exhaust. Air exhaust from spray operations shall not be directed so that it will contaminate makeup air being introduced into the spraying area or other ventilating intakes, nor directed so as to create a nuisance. Air exhausted from spray operations shall not be recirculated.

(10) Access Doors. When necessary to facilitate cleaning, exhaust ducts shall be provided with an ample number of access doors.

(11) Room Intakes. Air intake openings to rooms containing spray finishing operations shall be adequate for the efficient operation of exhaust fans and shall be so located as to minimize the creation of dead air pockets.

(12) Drying Spaces. Freshly sprayed articles shall be dried only in spaces provided with adequate ventilation to prevent the formation of explosive vapors. In the event adequate and reliable ventilation is not provided such drying spaces shall be considered a spraying area. (See also WAC 296-24-37019.) [Order 76-6, § 296-24-37007, filed 3/1/76; Order 73-5, § 296-24-37007, filed 5/9/73 and Order 73-4, § 296-24-37007, filed 5/7/73.]

WAC 296-24-37009 Flammable and combustible liquids—Storage and handling. (1) Conformance. The storage of flammable or combustible liquids in connection with spraying operations shall conform to the requirements of WAC 296-24-330, where applicable.

(2) Quantity. The quantity of flammable or combustible liquids kept in the vicinity of spraying operations shall be the minimum required for operations and should ordinarily not exceed a supply for 1 day or one shift. Bulk storage of portable containers of flammable or combustible liquids shall be in a separate, constructed

building detached from other important buildings or cut off in a standard manner.

(3) Containers. Original closed containers, approved portable tanks, approved safety cans or a properly arranged system of piping shall be used for bringing flammable or combustible liquids into spray finishing room. Open or glass containers shall not be used.

(4) Transferring Liquids. Except as provided in (5) of this section, the withdrawal of flammable and combustible liquids from containers having a capacity of greater than 60 gallons shall be by approved pumps. The withdrawal of flammable or combustible liquids from containers and the filling of containers, including portable mixing tanks, shall be done only in a suitable mixing room or in a spraying area when the ventilating system is in operation. Adequate precautions shall be taken to protect against liquid spillage and sources of ignition.

(5) Spraying Containers. Containers supplying spray nozzles shall be of closed type or provided with metal covers kept closed. Containers not resting on floors shall be on metal supports or suspended by wire cables. Containers supplying spray nozzles by gravity flow shall not exceed 10 gallons capacity. Original shipping containers shall not be subject to air pressure for supplying spray nozzles. Containers under air pressure supplying spray nozzles shall be of limited capacity, not exceeding that necessary for 1 day's operation; shall be designed and approved for such use; shall be provided with a visible pressure gage; and shall be provided with a relief valve set to operate in conformance with the requirements of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code—1968. Containers under air pressure supplying spray nozzles, air-storage tanks and coolers shall conform to the standards of the Code for Unfired Pressure Vessels, Section VIII of the ASME Boiler and Pressure Vessel Code—1968 for construction, tests, and maintenance.

(6) Pipes and Hoses. (a) All containers or piping to which is attached a hose or flexible connection shall be provided with a shutoff valve at the connection. Such valves shall be kept shut when spraying operations are not being conducted.

(b) When a pump is used to deliver products, automatic means shall be provided to prevent pressure in excess of the design working pressure of accessories, piping, and hose.

(c) All pressure hose and couplings shall be inspected at regular intervals appropriate to this service. The hose and couplings shall be tested with the hose extended, and using the "inservice maximum operating pressures". Any hose showing material deteriorations, signs of leakage, or weakness in its carcass or at the couplings, shall be withdrawn from service and repaired or discarded.

(d) Piping systems conveying flammable or combustible liquids shall be of steel or other material having comparable properties of resistance to heat and physical damage. Piping systems shall be properly bonded and grounded.

(7) Spray Liquid Heaters. Electrically powered spray liquid heaters shall be approved and listed for the specific location in which used (see WAC 296-24-37005). Heaters shall not be located in spray booths nor other

locations subject to the accumulation of deposits or combustible residue. Agitators, if used, should preferably be driven by compressed air, water, or low-pressure steam. If an electric motor is used, (see WAC 296-24-37005).

(8) Pump Relief. If flammable or combustible liquids are supplied to spray nozzles by positive displacement pumps, the pump discharge line shall be provided with an approved relief valve discharging to a pump suction or a safe detached location, or a device provided to stop the prime mover if the discharge pressure exceeds the safe operating pressure of the system.

(9) Grounding. Whenever flammable or combustible liquids are transferred from one container to another, both containers shall be effectively bonded and grounded to prevent discharge sparks of static electricity. [Order 73-5, § 296-24-37009, filed 5/9/73 and Order 73-4, § 296-24-37009, filed 5/7/73.]

WAC 296-24-37011 Protection. (1) Conformance. In sprinklered buildings, the automatic sprinkler system in rooms containing spray finishing operations shall conform to the Standard for the Installation of Sprinkler Systems, NFPA 13-1969, provisions for Extra Hazard Occupancy, and in unsprinklered buildings where sprinklers are installed only to protect spraying areas, the installations shall conform to such standards insofar as they may be applicable. Sprinkler installations shall also conform to the provisions of this section. Sprinkler heads shall be located to effect water distribution throughout the entire booth.

(2) Valve Access. Automatic sprinklers protecting each spray booth (together with its connecting exhaust) shall be under an accessibly located separate outside stem and yoke (OS&Y) subcontrol valve.

(3) Cleaning of Heads. Sprinklers protecting spraying areas shall be kept as free from deposits as practical by cleaning daily if necessary. (See also WAC 296-24-37013.)

(4) Portable Extinguishers. An adequate supply of suitable portable fire extinguishers shall be installed near all spraying areas. [Order 73-5, § 296-24-37011, filed 5/9/73 and Order 73-4, § 296-24-37011, filed 5/7/73.]

WAC 296-24-37013 Operations and maintenance.

(1) Spraying. Spraying shall not be conducted outside of predetermined spraying areas.

(2) Cleaning. All spraying areas shall be kept as free from the accumulation of deposits of combustible residues as practical, with cleaning conducted daily if necessary. Scrapers, spuds, or other such tools used for cleaning purposes shall be of nonsparking material.

(3) Residue Disposal. Residue scrapings and debris contaminated with residue shall be immediately removed from the premises and properly disposed of. Approved metal waste cans shall be provided wherever rags or waste are impregnated with finishing material and all such rags or waste deposited therein immediately after use. The contents of waste cans shall be properly disposed of at least once daily or at the end of each shift.

(4) Clothing Storage. Spray finishing employees' clothing shall not be left on the premises overnight unless kept in metal lockers.

(5) Cleaning solvents. The use of solvents for cleaning operations shall be restricted to those having flashpoints not less than 100°F.; however, for cleaning spray nozzles and auxiliary equipment, solvents having flashpoints not less than those normally used in spray operations may be used. Such cleaning shall be conducted inside spray booths and ventilating equipment operated during cleaning.

(6) Hazardous Materials Combinations. Spray booths shall not be alternately used for different types of coating materials, where the combination of the materials may be conducive to spontaneous ignition, unless all deposits of the first used material are removed from the booth and exhaust ducts prior to spraying with the second used material.

(7) "No Smoking" signs. "No smoking" signs in large letters on contrasting color background shall be conspicuously posted at all spraying areas and paint storage rooms. (See WAC 296-24-140.) [Order 73-5, § 296-24-37013, filed 5/9/73 and Order 73-4, § 296-24-37013, filed 5/7/73.]

WAC 296-24-37015 Fixed electrostatic apparatus.

(1) Conformance. Where installation and use of electrostatic spraying equipment is used, such installation and use shall conform to all other requirements contained in WAC 296-24-370 through WAC 296-24-37027.

(2) Type Approval. Electrostatic apparatus and devices used in connection with coating operations shall be of approved types.

(3) Location. Transformers, power packs, control apparatus, and all other electrical portions of the equipment, with the exception of high-voltage grids, electrodes, and electrostatic atomizing heads and their connections, shall be located outside of the spraying area, or shall otherwise conform to the requirements of WAC 296-24-37005.

(4) Support. Electrodes and electrostatic atomizing heads shall be adequately supported in permanent locations and shall be effectively insulated from the ground. Electrodes and electrostatic atomizing heads which are permanently attached to their bases, supports, or reciprocators, shall be deemed to comply with this section. Insulators shall be nonporous and noncombustible.

(5) Insulators, Grounding. High-voltage leads to electrodes shall be properly insulated and protected from mechanical injury or exposure to destructive chemicals. Electrostatic atomizing heads shall be effectively and permanently supported on suitable insulators and shall be effectively guarded against accidental contact or grounding. An automatic means shall be provided for grounding the electrode system when it is electrically deenergized for any reason. All insulators shall be kept clean and dry.

(6) Safe Distance. A safe distance shall be maintained between goods being painted and electrodes or electrostatic atomizing heads or conductors of at least twice the sparking distance. A suitable sign indicating this safe

distance shall be conspicuously posted near the assembly.

(7) **Conveyors Required.** Goods being painted using this process are to be supported on conveyors. The conveyors shall be so arranged as to maintain safe distances between the goods and the electrodes or electrostatic atomizing heads at all times. Any irregularly shaped or other goods subject to possible swinging or movement shall be rigidly supported to prevent such swinging or movement which would reduce the clearance to less than that specified in (6) of this section.

(8) **Prohibition.** This process is not acceptable where goods being coated are manipulated by hand. When finishing materials are applied by electrostatic equipment which is manipulated by hand, see WAC 296-24-37017 for applicable requirements. [Rev. 1-23-76]

(9) **Fail-safe Controls.** Electrostatic apparatus shall be equipped with automatic controls which will operate without time delay to disconnect the power supply to the high voltage transformer and to signal the operator under any of the following conditions:

(a) Stoppage of ventilating fans or failure of ventilating equipment from any cause.

(b) Stoppage of the conveyor carrying goods through the high voltage field.

(c) Occurrence of a ground or of an imminent ground at any point on the high voltage system.

(d) Reduction of clearance below that specified in (6) of this section.

(10) **Guarding.** Adequate booths, fencing, railings, or guards shall be so placed about the equipment that they, either by their location or character or both, assure that a safe isolation of the process is maintained from plant storage or personnel. Such railings, fencing, and guards shall be of conducting material, adequately grounded.

(11) **Ventilation.** Where electrostatic atomization is used the spraying area shall be so ventilated as to insure safe conditions from a fire and health standpoint.

(12) **Fire Protection.** All areas used for spraying, including the interior of the booth, shall be protected by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment shall be provided. [Order 76-6, § 296-24-37015, filed 3/1/76; Order 73-5, § 296-24-37015, filed 5/9/73 and Order 73-4, § 296-24-37015, filed 5/7/73.]

WAC 296-24-37017 Electrostatic hand spraying equipment. (1) **Application.** This section shall apply to any equipment using electrostatically charged elements for the atomization and/or, precipitation of materials for coatings on articles, or for other similar purposes in which the atomizing device is hand held and manipulated during the spraying operation.

(2) **Conformance.** Electrostatic hand spraying equipment shall conform with the other provisions of WAC 296-24-370 through 296-24-37027.

(3) **Equipment Approval and Specifications.** Electrostatic hand spray apparatus and devices used in connection with coating operations shall be of approved types. The equipment should be so designed that the maximum surface temperature of the equipment in the spraying

area shall not exceed 150°F. under any condition. The high voltage circuits shall be designed so as to not produce a spark of sufficient intensity to ignite any vapor-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under all normal operating conditions. The electrostatically charged exposed elements of the handgun shall be capable of being energized only by a switch which also controls the coating material supply.

(4) **Electrical Support Equipment.** Transformers, powerpacks, control apparatus, and all other electrical portions of the equipment, with the exception of the handgun itself and its connections to the powder supply shall be located outside of the spraying area or shall otherwise conform to the requirements of WAC 296-24-37005.

(5) **Spray Gun Ground.** The handle of the spraying gun shall be electrically connected to ground by a metallic connection and to be so constructed that the operator in normal operating position is in intimate electrical contact with the grounded handle.

(6) **Grounding—General.** All electrically conductive objects in the spraying area shall be adequately grounded. This requirement shall apply to paint containers, wash cans, and any other objects or devices in the area. The equipment shall carry a prominent permanently installed warning regarding the necessity for this grounding feature.

(7) **Maintenance of Grounds.** Objects being painted or coated shall be maintained in metallic contact with the conveyor or other grounded support. Hooks shall be regularly cleaned to insure this contact and areas of contact shall be sharp points or knife edges where possible. Points of support of the object shall be concealed from random spray where feasible and where the objects being sprayed are supported from a conveyor, the point of attachment to the conveyor shall be so located as to not collect spray material during normal operation.

(8) **Interlocks.** The electrical equipment shall be so interlocked with the ventilation of the spraying area that the equipment cannot be operated unless the ventilation fans are in operation.

(9) **Ventilation.** The spraying operation shall take place within a spray area which is adequately ventilated to remove solvent vapors released from the operation. [Order 73-5, § 296-24-37017, filed 5/9/73 and Order 73-4, § 296-24-37017, filed 5/7/73.]

WAC 296-24-37019 Drying, curing, or fusion apparatus. (1) **Conformance.** Drying, curing, or fusion apparatus in connection with spray application of flammable and combustible finishes shall conform to the Standard for Ovens and Furnaces, NFPA 86A-1969, where applicable and shall also conform with the following requirements of this section.

(2) **Alternate Use Prohibited.** Spray booths, rooms, or other enclosures used for spraying operations shall not alternately be used for the purpose of drying by any arrangement which will cause a material increase in the surface temperature of the spray booth, room, or enclosure.

(3) **Adjacent System Interlocked.** Except as specifically provided in (4) of this section, drying, curing, or fusion units utilizing a heating system having open flames or which may produce sparks shall not be installed in a spraying area, but may be installed adjacent thereto when equipped with an interlocked ventilating system arranged to:

(a) Thoroughly ventilate the drying space before the heating system can be started;

(b) Maintain a safe atmosphere at any source of ignition;

(c) Automatically shut down the heating system in the event of failure of the ventilating system.

(4) **Alternate Use Permitted.** Automobile refinishing spray booths or enclosures, otherwise installed and maintained in full conformity with this section, may alternately be used for drying with portable electrical infrared drying apparatus when conforming with the following:

(a) Interior (especially floors) of spray enclosures shall be kept free of overspray deposits.

(b) During spray operations, the drying apparatus and electrical connections and wiring thereto shall not be located within spray enclosure nor in any other location where spray residues may be deposited thereon.

(c) The spraying apparatus, the drying apparatus, and the ventilating system of the spray enclosure shall be equipped with suitable interlocks so arranged that:

(i) The spraying apparatus cannot be operated while the drying apparatus is inside the spray enclosure.

(ii) The spray enclosure will be purged of spray vapors for a period of not less than 3 minutes before the drying apparatus can be energized.

(iii) The ventilating system will maintain a safe atmosphere within the enclosure during the drying process and the drying process apparatus will automatically shut off in the event of failure of the ventilating system.

(d) All electrical wiring and equipment of the drying apparatus shall conform with the applicable sections of WAC 296-24-950 and WAC 296-24-955. Only equipment of a type approved for Class I, Division 2 hazardous locations shall be located within 18 inches of floor level. All metallic parts of the drying apparatus shall be properly electrically bonded and grounded.

(e) The drying apparatus shall contain a prominently located, permanently attached warning sign indicating that ventilation should be maintained during the drying period and that spraying should not be conducted in the vicinity that spray will deposit on apparatus. [Order 76-6, § 296-24-37019, filed 3/1/76; Order 73-5, § 296-24-37019, filed 5/9/73 and Order 73-4, § 296-24-37019, filed 5/7/73.]

WAC 296-24-37021 Automobile undercoating in garages. Automobile undercoating spray operations in garages, conducted in areas having adequate natural or mechanical ventilation, are exempt from the requirements pertaining to spray finishing operations, when using undercoating materials not more hazardous than kerosene (as listed by Underwriters' Laboratories in respect to fire hazard rating 30-40) or undercoating materials using only solvents listed as having a flash point

in excess of 100°F. Undercoating spray operations not conforming to these provisions are subject to all requirements of WAC 296-24-370 through WAC 296-24-37027, pertaining to spray finishing operations. [Order 73-5, § 296-24-37021, filed 5/9/73 and Order 73-4, § 296-24-37021, filed 5/7/73.]

WAC 296-24-37023 Powder coating. (1) **Electrical and Other Sources of Ignition.** Electrical equipment and other sources of ignition shall conform to the requirements of WAC 296-24-37005(1)(a) through (d), (8) and (9)(a) and WAC 296-24-950 and WAC 296-24-955.

(2) **Ventilation.** (a) In addition to the provisions of WAC 296-24-37007, where applicable, exhaust ventilation shall be sufficient to maintain the atmosphere below the lowest explosive limits for the materials being applied. All nondeposited air-suspended powders shall be safely removed via exhaust ducts to the powder recovery cyclone or receptacle. Each installation shall be designed and operated to meet the foregoing performance specification.

(b) Powders shall not be released to the outside atmosphere.

(3) **Drying, Curing, or Fusion Equipment.** The provisions of the Standard for ovens and furnaces, NFPA No. 86A-1969 shall apply where applicable.

(4) **Operation and Maintenance.** (a) All areas shall be kept free of the accumulation of powder coating dusts, particularly such horizontal surfaces as ledges, beams, pipes, hoods, booths, and floors.

(b) Surfaces shall be cleaned in such manner as to avoid scattering dust to other places or creating dust clouds.

(c) "No Smoking" signs in large letters on contrasting color background shall be conspicuously posted at all powder coating areas and powder storage rooms.

(5) **Fixed Electrostatic Spraying Equipment.** The provisions of WAC 296-24-37015 and other subsections of this section shall apply to fixed electrostatic equipment, except that electrical equipment not covered therein shall conform to (1) of this section.

(6) **Electrostatic Hand Spraying Equipment.** The provisions of WAC 296-24-37017 and other subsections of this section, shall apply to electrostatic handguns when used in powder coating, except that electrical equipment not covered therein shall conform to (1) of this section.

(7) **Electrostatic Fluidized Beds.** (a) Electrostatic fluidized beds and associated equipment shall be of approved types. The maximum surface temperature of this equipment in the coating area shall not exceed 150°F. The high voltage circuits shall be so designed as to not produce a spark of sufficient intensity to ignite any powder-air mixtures nor result in appreciable shock hazard upon coming in contact with a grounded object under normal operating conditions.

(b) Transformers, powerpacks, control apparatus, and all other electrical portions of the equipment, with the exception of the charging electrodes and their connections to the power supply shall be located outside of the powder coating area or shall otherwise conform to the requirements of (1) of this section.

(c) All electrically conductive objects within the charging influence of the electrodes shall be adequately grounded. The powder coating equipment shall carry a prominent, permanently installed warning regarding the necessity for grounding these objects.

(d) Objects being coated shall be maintained in contact with the conveyor or other support in order to insure proper grounding. Hangers shall be regularly cleaned to insure effective contact and areas of contact shall be sharp points or knife edges where possible.

(e) The electrical equipment shall be so interlocked with the ventilation system that the equipment cannot be operated unless the ventilation fans are in operation. [Order 76-6, § 296-24-37023, filed 3/1/76; Order 73-5, § 296-24-37023, filed 5/9/73 and Order 73-4, § 296-24-37023, filed 5/7/73.]

WAC 296-24-37025 Organic peroxides and dual component coatings. (1) Conformance. All spraying operations involving the use of organic peroxides and other dual component coatings shall be conducted in approved sprinklered spray booths meeting the requirements of this section.

(2) Smoking. Smoking shall be prohibited and "No Smoking" signs shall be prominently displayed and only nonsparking tools shall be used in any area where organic peroxides are stored, mixed or applied. [Order 73-5, § 296-24-37025, filed 5/9/73 and Order 73-4, § 296-24-37025, filed 5/7/73.]

WAC 296-24-37027 Scope. This section applies to flammable and combustible finishing materials when applied as a spray by compressed air, "airless" or "hydraulic atomization," steam, electrostatic methods, or by any other means in continuous or intermittent processes. The section also covers the application of combustible powders by powder spray guns, electrostatic powder spray guns, fluidized beds, or electrostatic fluidized beds. The section does not apply to outdoor spray application of buildings, tanks or other similar structures, nor to small portable spraying apparatus not used repeatedly in the same location. [Order 73-5, § 296-24-37027, filed 5/9/73 and Order 73-4, § 296-24-37027, filed 5/7/73.]

WAC 296-24-405 Dip tanks containing flammable or combustible liquids. [Order 73-5, § 296-24-405, filed 5/9/73 and Order 73-4, § 296-24-405, filed 5/7/73.]

WAC 296-24-40501 Definitions. (1) Dip tank. Shall mean a tank, vat, or container of flammable or combustible liquid in which articles or materials are immersed for the purpose of coating, finishing, treating, or similar processes.

(2) Vapor area. Shall mean any area containing dangerous quantities of flammable vapors in the vicinity of dip tanks, their drainboards or associated drying, conveying, or other equipment during operation or shutdown periods.

(3) Approved. Unless otherwise indicated, approval or listing by at least one of the following nationally recognized testing laboratories: Underwriters Laboratories, Inc.; Factory Mutual Engineering Corp.

(4) Listed. See "approved" in (3) of this section. [Order 73-5, § 296-24-40501, filed 5/9/73 and Order 73-4, § 296-24-40501, filed 5/7/73.]

WAC 296-24-40503 Ventilation. (1) Vapor Area Ventilation. Vapor areas as defined in WAC 296-24-40501(2) shall be limited to the smallest practical space by maintaining a properly designed system of mechanical ventilation arranged to move air from all directions towards the vapor area origin and thence to a safe outside location. Ventilating systems shall conform to the Standards for Blower and Exhaust Systems (NFPA Pamphlet No. 91-1969). Required ventilating systems shall be so arranged that the failure of any ventilating fan shall automatically stop any dipping conveyor system. See also WAC 296-24-40505(6).

(2) Ventilation Combined with Drying. When a required ventilating system serves associated drying operations utilizing a heating system which may be a source of ignition, means shall be provided for prevention before the heating system can be started; the failure of any ventilating fan shall automatically shut down the heating system; and the installation shall otherwise conform to the Standard for Ovens and Furnaces (NFPA No. 86A-1969). [Order 73-5, § 296-24-40503, filed 5/9/73 and Order 73-4, § 296-24-40503, filed 5/7/73.]

WAC 296-24-40505 Construction of dip tanks. (1) General. Dip tanks, including drainboards if provided, shall be constructed of substantial noncombustible material, and their supports shall be of heavy metal, reinforced concrete, or masonry. Where dip tanks extend through a floor to the story below or where the weakening of the tank supports by fire may result in the tank collapse, supports should be of material having not less than 1-hour fire resistance.

(2) Overflow Pipes. (a) Dip tanks of over 150 gallons in capacity or 10 square feet in liquid surface area shall be equipped with a properly trapped overflow pipe leading to a safe location outside buildings. Smaller dip tanks should also be so equipped, where practical. The discharge of the overflow pipe should be so located and arranged that if the entire combustible contents of the dip tank is overflowed through overflow pipe by the application of water during fire fighting, property will not be endangered. The size of the overflow pipe should be sufficient to conduct the maximum rate of flow of water expected to be applied to the liquid surface of the dip tank from automatic sprinklers or from other sources in the event of fire.

(b) Overflow pipes shall be of sufficient capacity to overflow the maximum delivery of dip tank liquid fill pipes but shall not be less than 3 inches in diameter and shall be increased in size depending upon the area of the liquid surface and the length and pitch of pipe.

(c) Piping connections on drains and overflow lines shall be designed so as to permit ready access for inspection and cleaning of the interior.

(d) The bottom of the overflow connection shall be not less than 6 inches below the top of the tank. See also (6) of this section and WAC 296-24-40513(3)(b).

(3) Bottom Drains. (a) Dip tanks over 500 gallons in liquid capacity shall be equipped with bottom drains automatically and manually arranged to quickly drain the tank in the event of fire, unless the viscosity of the liquid at normal atmospheric temperature makes this impractical. Manual operation shall be from a safely accessible location. Where gravity flow is not practicable, automatic pumps shall be required.

(b) Such drain shall be trapped and discharge to a closed properly vented salvage tank or to a safe location outside which will not endanger property.

(c) According to tank capacity the diameter of bottom drainpipe shall be not less than the following:

Gallons:	Inches
500 to 750	3
750 to 1,000	4
1,000 to 2,500	5
2,500 to 4,000	6
Over 4,000	8

(4) Salvage Tanks. The capacity of the salvage tank shall be greater than the capacity of the dip tank or tanks to which they are connected.

(5) Automatic Extinguishing Facilities. Except as noted in WAC 296-24-40515(1) (applying to hardening and tempering tanks), all dip tanks exceeding 150 gallons liquid capacity or having a liquid surface area exceeding 4 square feet shall be protected with at least one of the automatic extinguishing facilities conforming to WAC 296-24-40513(2),(3),(4),(5) or (6).

(6) Conveyor Systems. Dip tanks utilizing a conveyor system shall be so arranged that in the event of fire, the conveyor system shall automatically cease motion and required bottom drains shall open. Conveyor systems shall automatically cease motion unless required ventilation is in full operation. See also WAC 296-24-40503(1).

(7) Heating Dip Tank Liquids. When dip tank liquids are artificially heated, either by the dipping of heated articles, or by other application of heat to the liquid, provision shall be made to prevent a temperature rise greater than 50°F. below the flashpoint of the liquid. See also WAC 296-24-40515(1). [Order 73-5, § 296-24-40505, filed 5/9/73 and Order 73-4, § 296-24-40505, filed 5/7/73.]

WAC 296-24-40507 Liquids used in dip tanks, storage and handling. The storage of flammable and combustible liquids in connection with dipping operation shall conform to the requirements of WAC 296-24-330, where applicable. Where portable containers are used for the replenishment of flammable and combustible liquids, provision shall be made so that both the container and tank shall be positively grounded and electrically bonded to prevent static electric sparks. [Order 73-5, §

296-24-40507, filed 5/9/73 and Order 73-4, § 296-24-40507, filed 5/7/73.]

WAC 296-24-40509 Electrical and other sources of ignition. (1) Vapor Areas. (a) There shall be no open flames, spark producing devices, or heated surfaces having a temperature sufficient to ignite vapors in any vapor area. Except as specifically permitted in WAC 296-24-40515(3), relating to electrostatic apparatus, electrical wiring and equipment in any vapor area (as defined in WAC 296-24-40501(2)) shall be explosion proof type according to the requirements of WAC 296-24-950 and WAC 296-24-955 for Class I, Group D locations and shall otherwise conform to WAC 296-24-950 and WAC 296-24-955.

(b) Unless specifically approved for locations containing both deposits of readily ignitable residues and explosive vapors, there shall be no electrical equipment in the vicinity of dip tanks or associated drainboards or drying operations which are subject to splashing or dripping of dip tank liquids, except wiring in rigid conduit or in threaded boxes or fittings containing no taps, splices, or terminal connections, and except as specifically permitted in WAC 296-24-40515(3).

(2) Adjacent Areas. In any floorspace outside a vapor area but within 20 feet therefrom, and not separated by tight partitions, there shall be no open flames or spark producing devices except as specifically permitted in NFPA Standard No. 86A-1969, Ovens and Furnaces, paragraph 200-7, and electrical wiring and equipment shall conform to the provisions of WAC 296-24-950 and WAC 296-24-955. [Order 76-6, § 296-24-40509, filed 3/1/76; Order 73-5, § 296-24-40509, filed 5/9/73 and Order 73-4, § 296-24-40509, filed 5/7/73.]

WAC 296-24-40511 Operations and maintenance.

(1) General. Areas in the vicinity of dip tanks shall be kept as clear of combustible stock as practical and shall be kept entirely free of combustible debris.

(2) Waste Cans. When waste or rags are used in connection with dipping operations, approved metal waste cans shall be provided and all impregnated rags or waste deposited therein immediately after use. The contents of waste cans shall be properly disposed of at least once daily at the end of each shift.

(3) Inspection. Periodic inspection or tests of all dip tank facilities shall be made, including covers, overflow pipe inlets and discharge, bottom drains and valves, electrical wiring and equipment and grounding connections, ventilating facilities, and all extinguishing equipment. Any defects found shall be promptly corrected.

(4) Warning Signs. "No Smoking" signs in large letters on contrasting color background shall be conspicuously posted in the vicinity of dip tanks. [Order 73-5, § 296-24-40511, filed 5/9/73 and Order 73-4, § 296-24-40511, filed 5/7/73.]

WAC 296-24-40513 Extinguishment. (1) Extinguishers. Areas in the vicinity of dip tanks shall be provided with manual fire extinguishers suitable for flammable and combustible liquid fires, conforming to

Standard for Portable Fire Extinguishers NFPA No. 10-1970.

(2) Automatic Water Spray Extinguishing Systems. Such systems shall conform to NFPA Standard for Water Spray Systems for Fire Protection NFPA No. 15-1969 and shall be arranged to protect tanks, drainboards, and stock over drainboards.

(3) Automatic Foam Extinguishing Systems. Automatic foam extinguishing systems shall conform to NFPA Standard for Foam Extinguishing Systems, NFPA No. 11-1970 and;

(a) Foam producing material selected shall be suitable for intended use, taking into account characteristics of the dip tank liquid;

(b) Overflow pipe shall be arranged to prevent the floating away of foam and clogging overflow pipe. This may be accomplished by either of the following:

(i) Overflow pipe may be extended through tank wall and terminated in an ell pointing downward. The bottom of the overflow pipe at the point it pierces tank wall should not be over 2 inches above the opening or face of the ell.

(ii) Overflow pipe inlet may be provided with a removable screen of 1/4-inch mesh having an area at least twice the cross-sectional area of overflow pipe. Screens which may be clogged by dip tank ingredients shall be inspected and cleaned periodically.

(4) Automatic Carbon Dioxide Systems. Automatic carbon dioxide systems shall conform to NFPA Standard for Carbon Dioxide Extinguishing Systems, NFPA No. 12-1968, and shall be arranged to protect both dip tanks and drainboards and unless stock over drainboards is otherwise protected with automatic extinguishing facilities, shall also be arranged to protect such stock.

(5) Dry Chemical Extinguishing Systems. Dry chemical extinguishing systems shall conform to NFPA Standard for Dry Chemical Extinguishing Systems NFPA No. 17-1969 and shall be arranged to protect both dip tanks and drainboards, and unless stock over drainboards is otherwise protected with automatic extinguishing facilities, shall also be arranged to protect such stock.

(6) Dip Tank Covers. (a) Covers arranged to close automatically in the event of fire shall be actuated by approved automatic devices and shall also be arranged for manual operation.

(b) Covers shall be of substantial noncombustible material or of tin-clad type with enclosing metal applied with locked joints.

(c) Chains or wire rope shall be used for cover support or operating mechanism where the burning of a cord would interfere with the action of a device.

(d) Covers shall be kept closed when tanks are not in use. [Order 73-5, § 296-24-40513, filed 5/9/73 and Order 73-4, § 296-24-40513, filed 5/7/73.]

WAC 296-24-40515 Special dip tank applications.

(1) Hardening and Tempering Tanks. (a) Tanks shall be located as far as practicable from furnaces and shall not be located on or near combustible floors.

(b) Tanks shall be provided with a noncombustible hood and vent or other equally effective means of venting to the outside of the building to serve as a vent in case of fire. All such vent ducts shall be treated as flues and be kept well away from combustible roofs or materials.

(c) Tanks shall be so designed that the maximum workload is incapable of raising the temperature of the cooling medium to within 50° below its flashpoint, or such tanks shall be equipped with circulating cooling systems which will accomplish the same result.

(d) Tanks shall be equipped with a high temperature limit switch arranged to sound an alarm when the temperature of the quenching medium reaches within 50°F. below the flashpoint. If practical from an operating standpoint, such limit switches shall also shut down conveying equipment supplying work to the tank.

(e) The provisions of WAC 296-24-40505(5) shall apply to tanks having a liquid surface area of 25 square feet or more or a capacity of 500 gallons or more.

(f) Air under pressure shall not be used to fill or to agitate oil tanks.

(g) Drain facilities from the bottom of the tank may be combined with the oil circulating system or arranged independently to drain the oil to a safe location. The drain valve shall be operated automatically with approved heat actuated devices or manually, and if the latter, the valve shall be operated from a safe distance.

(2) Flow Coat; General. (a) Except as modified in this subsection, all of the preceding standards for dip tanks apply.

(b) All piping shall be strongly erected and rigidly supported.

(c) Paint shall be supplied by direct low-pressure pumping arranged to automatically shut down by means of approved heat actuated devices, in the case of fire, or paint may be supplied by a gravity tank not exceeding 10 gallons in capacity.

(d) The area of the sump and any areas on which paint flows should be considered the area of dip tank.

(3) Electrostatic Apparatus; General. (a) Installation and use of electrostatic detearing equipment shall conform to WAC 296-24-40501 through WAC 296-24-40513.

(b) Electrostatic apparatus and devices used in connection with paint detearing operations shall be of approved types.

(c) Transformers, powerpacks, control apparatus, and all other electrical portions of the equipment, with the exception of high voltage grids and their connections, shall be located outside the vapor area or shall conform to the requirements of WAC 296-24-40509.

(d) Electrodes shall be of substantial construction, shall be rigidly supported in permanent locations and shall be effectively insulated from ground. Insulators shall be nonporous and noncombustible.

(e) High voltage leads to electrodes shall be effectively and permanently supported on suitable insulators, and shall be effectively guarded against accidental contact or grounding. An automatic means shall be provided for grounding and discharging any accumulated residual

charge on the electrode assembly or the secondary circuit of the high voltage transformer when the transformer primary is disconnected from the source of supply.

(f) A space shall be maintained between goods being deteared and electrodes or conductors of at least twice the sparking distance. A suitable sign stating the sparking distance shall be conspicuously posted near the assembly.

(g) Goods being deteared using this electrostatic process are to be supported on conveyors. The conveyors shall be so arranged as to maintain safe distances between the goods and the electrodes at all times. All goods shall be so supported as to prevent any swinging or movement which would reduce the clearance to less than specified in (3)(f) of this section.

(h) This electrostatic process is not approved where goods being deteared are manipulated by hand.

(i) Electrostatic apparatus shall be equipped with automatic controls which will operate without time delay to disconnect the power supply to the high voltage transformer and to signal the operator under any of the following conditions:

(i) Stoppage of ventilating fans or failure of ventilating equipment from any cause.

(ii) Stoppage of the conveyor carrying goods past the high voltage grid.

(iii) Occurrence of a ground or of an imminent ground at any point on the high voltage system.

(iv) Reduction of clearance below that specified in (3)(f) of this section.

(j) Adequate fencing, railings, or guards shall be so placed about the equipment that they, either by their location or character or both, assure that a safe isolation of the process is maintained from plant storage or personnel. Such railings, fencing and guards shall be of conducting material, adequately grounded, and should be at least 5 feet from processing equipment.

(k) Electrode insulators shall be kept clean and dry.

(l) The detearing area shall be ventilated by exhausting adequate air from the area as specified in WAC 296-24-40503.

(m) All areas for detearing shall be protected by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment shall be provided.

(n) Drip plates and screens subject to paint deposits shall be removable and shall be taken to a safe place for cleaning.

(4) Roll coating. (a) The processes of roll coating, spreading, and impregnating, in which fabrics, paper, or other materials are passed directly through a tank or through containing flammable or combustible liquids, or over the surface of a roller that revolves partially submerged in a Class I or Class II liquid, as these terms are defined in WAC 296-24-33001, shall conform to the applicable requirements of WAC 296-24-40501 through WAC 296-24-40513.

(b) Adequate arrangements shall be made to prevent sparks from static electricity by electrically bonding and grounding all metallic rotating and other parts of machinery and equipment and by the installation of static

collectors or maintaining a conductive atmosphere such as a high relative humidity. [Order 76-6, § 296-24-40515, filed 3/1/76; Order 74-27, § 296-24-40515, filed 5/7/74; Order 73-5, § 296-24-40515, filed 5/9/73 and Order 73-4, § 296-24-40515, filed 5/7/73.]

WAC 296-24-450 Chlorine cylinders used in chlorinator systems. Ventilation, storage of tanks and use of tanks shall meet specifications of The Chlorine Manual, The Chlorine Institute, Inc., Third Edition, 1959. [Order 74-27, § 296-24-450, filed 5/7/74.]

Part F-1

STORAGE AND HANDLING OF LIQUEFIED PETROLEUM GASES

WAC

296-24-475	Storage and handling of liquefied petroleum gases.
296-24-47501	Definitions.
296-24-47503	Scope.
296-24-47505	Basic rules.
296-24-47507	Cylinder systems.
296-24-47509	Systems utilizing containers other than DOT containers.
296-24-47511	Liquefied petroleum gas as a motor fuel.
296-24-47513	Storage of containers awaiting use or resale.
296-24-47515	LP-Gas system installations on commercial vehicles.
296-24-47517	Liquefied petroleum gas service stations.

WAC 296-24-475 Storage and handling of liquefied petroleum gases. [Order 73-5, § 296-24-475, filed 5/9/73 and Order 73-4, § 296-24-475, filed 5/7/73.]

WAC 296-24-47501 Definitions. (1) API-ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505(3)(a).

(2) ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505(3)(a).

(3) Container assembly. An assembly consisting essentially of the container and fittings for all container openings, including shutoff valves, excess flow valves, liquid-level gaging devices, safety relief devices, and protective housing.

(4) Containers. All vessels, such as tanks, cylinders, or drums, used for transportation or storing liquefied petroleum gases.

(5) DOT. Department of Transportation.

(6) DOT container. A container constructed in accordance with the applicable requirements of 49 CFR chapter 1.

(7) "Liquefied petroleum gases." "LPG" and "LP-Gas". Any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butane or iso-butane), and butylenes.

(8) Movable fuel storage tenders or farm carts. Containers not in excess of 1,200 gallons water capacity, equipped with wheels to be towed from one location of use to another. They are basically nonhighway vehicles, but may occasionally be moved over public roads or highways. They are used as a fuel supply for farm tractors, construction machinery and similar equipment.

(9) P.S.I.G. Pounds per square inch gauge.

charge on the electrode assembly or the secondary circuit of the high voltage transformer when the transformer primary is disconnected from the source of supply.

(f) A space shall be maintained between goods being deteared and electrodes or conductors of at least twice the sparking distance. A suitable sign stating the sparking distance shall be conspicuously posted near the assembly.

(g) Goods being deteared using this electrostatic process are to be supported on conveyors. The conveyors shall be so arranged as to maintain safe distances between the goods and the electrodes at all times. All goods shall be so supported as to prevent any swinging or movement which would reduce the clearance to less than specified in (3)(f) of this section.

(h) This electrostatic process is not approved where goods being deteared are manipulated by hand.

(i) Electrostatic apparatus shall be equipped with automatic controls which will operate without time delay to disconnect the power supply to the high voltage transformer and to signal the operator under any of the following conditions:

(i) Stoppage of ventilating fans or failure of ventilating equipment from any cause.

(ii) Stoppage of the conveyor carrying goods past the high voltage grid.

(iii) Occurrence of a ground or of an imminent ground at any point on the high voltage system.

(iv) Reduction of clearance below that specified in (3)(f) of this section.

(j) Adequate fencing, railings, or guards shall be so placed about the equipment that they, either by their location or character or both, assure that a safe isolation of the process is maintained from plant storage or personnel. Such railings, fencing and guards shall be of conducting material, adequately grounded, and should be at least 5 feet from processing equipment.

(k) Electrode insulators shall be kept clean and dry.

(l) The detearing area shall be ventilated by exhausting adequate air from the area as specified in WAC 296-24-40503.

(m) All areas for detearing shall be protected by automatic sprinklers where this protection is available. Where this protection is not available, other approved automatic extinguishing equipment shall be provided.

(n) Drip plates and screens subject to paint deposits shall be removable and shall be taken to a safe place for cleaning.

(4) Roll coating. (a) The processes of roll coating, spreading, and impregnating, in which fabrics, paper, or other materials are passed directly through a tank or through containing flammable or combustible liquids, or over the surface of a roller that revolves partially submerged in a Class I or Class II liquid, as these terms are defined in WAC 296-24-33001, shall conform to the applicable requirements of WAC 296-24-40501 through WAC 296-24-40513.

(b) Adequate arrangements shall be made to prevent sparks from static electricity by electrically bonding and grounding all metallic rotating and other parts of machinery and equipment and by the installation of static

collectors or maintaining a conductive atmosphere such as a high relative humidity. [Order 76-6, § 296-24-40515, filed 3/1/76; Order 74-27, § 296-24-40515, filed 5/7/74; Order 73-5, § 296-24-40515, filed 5/9/73 and Order 73-4, § 296-24-40515, filed 5/7/73.]

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WAC 296-24-475 Storage and handling of liquefied petroleum gases. [Order 73-5, § 296-24-475, filed 5/9/73 and Order 73-4, § 296-24-475, filed 5/7/73.]

WAC 296-24-47501 Definitions. (1) API-ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505(3)(a).

(2) ASME container. A container constructed in accordance with the requirements of WAC 296-24-47505(3)(a).

(3) Container assembly. An assembly consisting essentially of the container and fittings for all container openings, including shutoff valves, excess flow valves, liquid-level gaging devices, safety relief devices, and protective housing.

(4) Containers. All vessels, such as tanks, cylinders, or drums, used for transportation or storing liquefied petroleum gases.

(5) DOT. Department of Transportation.

(6) DOT container. A container constructed in accordance with the applicable requirements of 49 CFR chapter 1.

(7) "Liquefied petroleum gases." "LPG" and "LP-Gas". Any material which is composed predominantly of any of the following hydrocarbons, or mixtures of them; propane, propylene, butanes (normal butane or iso-butane), and butylenes.

(8) Movable fuel storage tenders or farm carts. Containers not in excess of 1,200 gallons water capacity, equipped with wheels to be towed from one location of use to another. They are basically nonhighway vehicles, but may occasionally be moved over public roads or highways. They are used as a fuel supply for farm tractors, construction machinery and similar equipment.

(9) P.S.I.G. Pounds per square inch gauge.

- (10) P.S.I.A. Pounds per square inch absolute.
- (11) Systems. An assembly of equipment consisting essentially of the container or containers, major devices such as vaporizers, safety relief valves, excess flow valves, regulators, and piping connecting such parts.
- (12) Vaporizer-burner. An integral vaporizer-burner unit, dependent upon the heat generated by the burner as the source of heat to vaporize the liquid used for dehydrators or dryers.
- (13) Ventilation, adequate. When specified for the prevention of fire during normal operation, ventilation shall be considered adequate when the concentration of the gas in a gas-air mixture does not exceed 25 percent of the lower flammable limit.
- (14) Approved. Unless otherwise indicated, listing or approval by the following nationally recognized testing laboratories: Underwriters Laboratories, Inc.; Factual Mutual Engineering Corp.
- (15) Listed. See "approved" in WAC 296-24-47501(14).
- (16) DOT Specifications. Regulations of the Department of Transportation published in 49 CFR chapter I.
- (17) DOT regulations. See WAC 296-24-47501(16).
- (18) DOT requirements. See WAC 296-24-47501(16).
- (19) DOT cylinders. Cylinders meeting the requirements of 49 CFR Chapter I. [Order 73-5, § 296-24-47501, filed 5/9/73 and Order 73-4, § 296-24-47501, filed 5/7/73.]

WAC 296-24-47503 Scope. (1) Application. (a) WAC 296-24-47505 applies to installations made in accordance with the requirements of WAC 296-24-47507 through WAC 296-24-47511, WAC 296-24-47515 and WAC 296-24-47517, except as noted in each of those sections.

(b) WAC 296-24-47507 through WAC 296-24-47517 apply as provided in each of those sections.

(2) Inapplicability. These sections do not apply to:

(a) Marine and pipeline terminals, natural gas processing plants, refineries, or tank farms other than those at industrial sites.

(b) LP-Gas refrigerated storage systems;

(c) LP-Gas when used with oxygen. The requirements of WAC 296-24-680 through WAC 296-24-722 shall apply to such use;

(d) LP-Gas when used in utility gas plants. The National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases at Utility Gas Plants, NFPA No. 59-1968, shall apply to such use;

(e) Low-pressure (not in excess of one-half pound per square inch or 14 inches water column) LP-Gas piping systems, and the installation and operation of residential and commercial appliances including their inlet connections, supplied through such systems. For such systems, the National Fire Protection Association Standard for the Installation of Gas Appliances and Gas Piping, NFPA 54-1969 shall apply.

(3) Retroactivity. Unless otherwise stated, it is not intended that the provisions of these sections be retroactive.

(a) Existing plants, appliances, equipment, buildings, structures, and installations for the storage, handling or use of LP-Gas, which were in compliance with the current provisions of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases NFPA NO. 58-1972, 1973 at the time of manufacture or installation may be continued in use, if such continued use does not constitute a recognized hazard that is causing or is likely to cause death or serious physical harm to employees.

(b) Stocks of equipment and appliances on hand in such locations as manufacturers' storage, distribution warehouses, and dealers' storage and showrooms, which were in compliance with the current provisions of the National Fire Protection Association Standard for the Storage and Handling of Liquefied Petroleum Gases, NFPA No. 58-1972, 1973, at the time of manufacture, may be placed in service, if such use does not constitute a recognized hazard that is causing or is likely to cause death or serious physical harm to employees. [Order 73-5, § 296-24-47503, filed 5/9/73 and Order 73-4, § 296-24-47503, filed 5/7/73.]

WAC 296-24-47505 Basic rules. (1) Odorizing Gases. (a) All liquefied petroleum gases shall be effectively odorized by an approved agent of such character as to indicate positively, by distinct odor, the presence of gas down to concentration in air of not over one-fifth the lower limit of flammability. Odorization, however, is not required if harmful in the use of further processing of the liquefied petroleum gas, or if odorization will serve no useful purpose as a warning agent in such use or further processing.

(b) The odorization requirement of (1)(a) of this section shall be considered to be met by the use of 1.0 pounds of ethyl mercaptan, 1.0 pounds of thiophane or 1.4 pounds of amyl mercaptan per 10,000 gallons of LP-Gas. However, this listing of odorants and quantities shall not exclude the use of other odorants that meet the odorization requirements of (1)(a) of this section.

(2) Approval of Equipment and Systems. (a) Each system utilizing DOT containers in accordance with 49 CFR Part 178 shall have its container valves, connectors, manifold valve assemblies, and regulators approved.

(b) Each system for domestic or commercial use utilizing containers of 2,000 gallons or less water capacity, other than those constructed in accordance with 49 CFR Part 178, shall consist of a container assembly and one or more regulators, and may include other parts. The system as a unit or the container assembly as a unit, and the regulator or regulators, shall be individually listed.

(c) In systems utilizing containers of over 2,000 gallons water capacity, each regulator, container, valve, excess flow valve, gaging device, and relief valve installed on or at the container, shall have its correctness as to design, construction, and performance determined by listing by Underwriters Laboratories, Inc., or Factory Mutual Engineering Corp.

(d) The provisions of (3)(a) of this section shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with the standard for the Storage and Handling of

Liquefied Petroleum Gases NFPA No. 58 in effect at the time of fabrication.

(e) Containers used with systems embodied in WAC 296-24-47505, WAC 296-24-47509(3)(c) and WAC 296-24-47513, shall be constructed, tested, and stamped in accordance with DOT specifications effective at the date of their manufacture.

(3) Requirements for Construction and Original Test of Containers. (a) Containers used with systems embodied in WAC 296-24-47509, WAC 296-24-47513 through WAC 296-24-47517, except as provided in WAC 296-24-47511(3)(c) and WAC 296-24-47515(2)(a), shall be designed, constructed, and tested in accordance with the Rules for Construction of Unfired Pressure Vessels, section VIII, Division 1, American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, 1968 edition.

(b) Containers constructed according to the 1949 and earlier editions of the ASME Code do not have to comply with U-2 through U-10 and U-19 thereof. Containers constructed according to U-70 in the 1949 and earlier editions do not meet the requirements of this section.

(c) Containers designed, constructed, and tested prior to July 1, 1961, according to the Code for Unfired Pressure Vessels for Petroleum Liquids and Gases, 1951 edition with 1954 Addenda, of the American Petroleum Institute and the American Society of Mechanical Engineers shall be considered in conformance. Containers constructed according to API-ASME Code do not have to comply with section I or with appendix to section I. W-601 to W-606 inclusive in the 1943 and earlier editions do not apply.

(4) Welding of Containers. (a) Welding to the shell, head, or any other part of the container subject to internal pressure, shall be done in compliance with the code under which the tank was fabricated. Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the tank manufacturer.

(b) Where repair or modification involving welding of DOT containers is required, the container shall be returned to a qualified manufacturer making containers of the same type, and the repair or modification made in compliance with DOT regulations.

(5) Markings on Container. (a) Each container covered in (3)(a) of this section except as provided in (2)(d) of this section shall be marked as specified in the following:

(i) With a marking identifying compliance with, and other markings required by, the rules of the reference under which the container is constructed; or with the stamp and other markings required by the laws, rules or regulations as administered by the State of Washington, Department of Labor and Industries pertaining to such containers.

(ii) With notation as to whether the container is designed for underground or aboveground installation or both. If intended for both and different style hoods are provided, the marking shall indicate the proper hood for each type of installation.

(iii) With the name and address of the supplier of the container, or with the trade name of the container.

(iv) With the water capacity of the container in pounds or gallons, U.S. Standard.

(v) With the pressure in p.s.i.g. for which the container is designed.

(vi) With the wording "This container shall not contain a product having a vapor pressure in excess of— p.s.i.g. at 100°F.," see WAC 296-24-47509, Table H-31.

(vii) With the tare weight in pounds or other identified unit of weight for containers with a water capacity of 300 pounds or less.

(viii) With marking indicating the maximum level to which the container may be filled with liquid at temperatures between 20°F. and 130°F., except on containers provided with fixed maximum level indicators or which are filled by weighing. Markings shall be increments of not more than 20°F. This marking may be located on the liquid level gaging device.

(ix) With the outside surface area in square feet.

(b) Markings specified shall be on a metal nameplate attached to the container and located in such a manner as to remain visible after the container is installed.

(c) When LP-Gas and one or more other gases are stored or used in the same area, the containers shall be marked to identify their content. Marking shall be in compliance with American National Standard Z48.1-1954, "Method of Marking Portable Compressed Gas Containers To Identify the Material Contained."

(6) Location of Containers and Regulating Equipment. (a) Containers, and first stage regulating equipment if used, shall be located outside of buildings, except under one or more of the following:

(i) In buildings used exclusively for container charging, vaporization pressure reduction, gas mixing, gas manufacturing, or distribution.

(ii) When portable use is necessary and in accordance with WAC 296-24-47507(5).

(iii) LP-Gas fueled stationary or portable engines in accordance with WAC 296-24-47511(11) or (12).

(iv) LP-Gas fueled industrial trucks used in accordance with WAC 296-24-47511(13).

(v) LP-Gas fueled vehicles garaged in accordance with WAC 296-24-47511(14).

(vi) Containers awaiting use or resale when stored in accordance with WAC 296-24-47513.

(b) Each individual container shall be located with respect to the nearest important building or group of buildings or line of adjoining property which may be built on in accordance with Table H-23.

TABLE H-23

Water capacity per container	Minimum distances		
	Under-ground	Above-ground	Between above-ground containers

Less than 125 gals¹ — 10 feet — None — None.
 125 to 250 gallons — 10 feet — 10 feet — None.

TABLE H-23

Water capacity per container	Minimum distances		
	Containers		Between above-ground containers
	Under-ground	Above-ground	
251 to 500 gallons	10 feet	10 feet	3 feet.
501 to 2,000 gallons	25 feet ²	25 feet ²	3 feet.
2,001 to 30,000 gallons	50 feet	50 feet	5 feet.
30,001 to 70,000 gallons	50 feet	75 feet	1/4 of sum of diameters of adjacent containers.
70,001 to 90,000 gallons	50 feet	100 feet	

¹If the aggregate water capacity of a multi-container installation at a consumer site is 501 gallons or greater, the minimum distance shall comply with the appropriate portion of this table, applying the aggregate capacity rather than the capacity per container. If more than one installation is made, each installation shall be separated from another installation by at least 25 feet. Do not apply the MINIMUM DISTANCES BETWEEN ABOVE-GROUND CONTAINERS to such installations.

²NOTE: The above distance requirements may be reduced to not less than 10 feet for a single container of 1,200 gallons water capacity or less, providing such a container is at least 25 feet from any other LP-Gas container of more than 125 gallons water capacity.

(c) Containers installed for use shall not be stacked one above the other.

(d) In industrial installations involving containers of 180,000 gallons aggregate water capacity or more, where serious mutual exposures between the container and adjacent properties prevail, firewalls or other means of special protection designed and constructed in accordance with good engineering practices are required.

(e) In the case of buildings devoted exclusively to gas manufacturing and distributing operations, the distances required by Table H-23 may be reduced provided that in no case shall containers of water capacity exceeding 500 gallons be located closer than 10 feet to such gas manufacturing and distributing buildings.

(f) Readily ignitable material such as weeds and long dry grass shall be removed within 10 feet of any container.

(g) The minimum separation between liquefied petroleum gas containers and flammable liquid tanks shall be 20 feet, and the minimum separation between a container and the centerline of the dike shall be 10 feet. The foregoing provision shall not apply when LP-Gas containers of 125 gallons or less capacity are installed adjacent to Class III flammable liquid tanks of 275 gallons or less capacity.

(h) Suitable means shall be taken to prevent the accumulation of flammable liquids under adjacent liquefied petroleum gas containers, such as by diking, diversion curbs, or grading.

(i) When dikes are used with flammable liquid tanks, no liquefied petroleum gas containers shall be located within the diked area.

(7) Container Valves and Container Accessories. (a) Valves, fittings, and accessories connected directly to the container including primary shutoff 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. Cast iron shall not be used for container valves, fittings, and accessories. This does not prohibit the use of container valves made of malleable or nodular iron.

(b) Connections to containers, except safety relief connections, liquid level gaging devices, and plugged openings, shall have shutoff valves located as close to the container as practicable.

(c) Excess flow valves, where required shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections or line including valves, fittings, etc., being protected by an excess flow valve shall have a greater capacity than the rated flow of the excess flow valve.

(d) Liquid level gaging devices which are so constructed that outward flow of container contents shall not exceed that passed by a No. 54 drill size opening, need not be equipped with excess flow valves.

(e) Openings from container or through fittings attached directly on container to which pressure gage connection is made, need not be equipped with shutoff or excess flow valves if such openings are restricted to not larger than No. 54 drill size opening.

(f) Except as provided in WAC 296-24-47507(5)(a)(ii), excess flow and back pressure check valves where required by this section shall be located inside of the container or at a point outside where the line enters the container; in the latter case, installation shall be made in such manner that any undue strain beyond the excess flow or back pressure check valve will not cause breakage between the container and such valve.

(g) Excess flow valves shall be designed with a bypass, not to exceed a No. 60 drill size opening to allow equalization of pressures.

(h) Containers of more than 30 gallons water capacity and less than 2,000 gallons water capacity, filled on a volumetric basis, and manufactured after December 1, 1963, shall be equipped for filling into the vapor space.

(8) Piping—Including Pipe, Tubing, and Fittings. (a) Pipe, except as provided in WAC 296-24-47511(6)(a) and WAC 296-24-47515(10)(c) shall be wrought iron or steel (black or galvanized), brass, copper, or aluminum alloy. Aluminum alloy pipe shall be at least Schedule 40 in accordance with the specifications for Aluminum Alloy Pipe, American National Standards Institute (AMSI) H38.7-1969 (ASTM, B241-1969), except that the use of alloy 5456 is prohibited and shall be suitably marked at each end of each length indicating compliance with American National Standard Institute Specifications. Aluminum Alloy pipe shall be protected against external corrosion when it is in contact with dissimilar metals other than galvanized steel, or its location is subject to repeated wetting by such liquids as water (except rain water), detergents, sewage, or leaking from

other piping, or it passes through flooring, plaster, masonry, or insulation. Galvanized sheet steel or pipe, galvanized inside and out, may be considered suitable protection. The maximum nominal pipe size for aluminum pipe shall be three-fourths inch and shall not be used for pressures exceeding 20 p.s.i.g. Aluminum alloy pipe shall not be installed within 6 inches of the ground.

(i) Vapor piping with operating pressures not exceeding 125 p.s.i.g. shall be suitable for a working pressure of at least 125 p.s.i.g. Pipe shall be at least Schedule 40 ASTM A-53-69, Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal.

(ii) Vapor piping with operating pressures over 125 p.s.i.g. and all liquid piping shall be suitable for a working pressure of at least 250 p.s.i.g. Pipe shall be at least Schedule 80 if joints are threaded or threaded and back welded. At least Schedule 40 (ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal) shall be used if joints are welded, or welded and flanged.

(b) Tubing shall be seamless and of copper, brass, steel, or aluminum alloy. Copper tubing shall be of type K or L or equivalent as covered in the Specification for Seamless Copper Water Tube, ANSI H23.1-1970 (ASTM B88-1969). Aluminum alloy tubing shall be of Type A or B or equivalent as covered in Specification ASTM B210-1968 and shall be suitably marked every 18 inches indicating compliance with ASTM Specifications. The minimum nominal wall thickness of copper tubing and aluminum alloy tubing shall be as specified in Table H-24 and Table H-25.

TABLE H-24

WALL THICKNESS OF COPPER TUBING¹

NOTE: The standard size by which tube is designated is 1/8-inch smaller than its nominal outside diameter.

Standard size (inches)	Nominal O.D. (inches)	Nominal wall thickness (inches)	
		Type K	Type L
1/4	0.375	0.035	0.030
3/8	0.500	0.049	0.035
1/2	0.625	0.049	0.040
5/8	0.750	0.049	0.042
3/4	0.875	0.065	0.045
1	1.125	0.065	0.050
1 1/4	1.375	0.065	0.055
1 1/2	1.625	0.072	0.060
2	2.125	0.083	0.070

¹Based on data in Specification for Seamless Copper Water Tubing, ANSI H23.1-1970 (ASTM B-88-69).

TABLE H-25

WALL THICKNESS OF ALUMINUM ALLOY TUBING¹

Outside diameter (inches)	Nominal wall thickness (inches)	
	Type A	Type B
3/8	0.035	0.049
1/2	0.035	0.049
5/8	0.042	0.049
3/4	0.049	0.058

¹Based on data in Standard Specification for Aluminum-Alloy Drawn Seamless Coiled Tubes for Special Purpose Applications, ASTM B210-68.

Aluminum alloy tubing shall be protected against external corrosion when it is in contact with dissimilar metals other than galvanized steel, or its location is subject to repeated wetting by liquids such as water (except rainwater), detergents, sewage, or leakage from other piping, or it passes through flooring, plaster, masonry, or insulation. Galvanized sheet steel or pipe, galvanized inside and out, may be considered suitable protection. The maximum outside diameter for aluminum alloy tubing shall be three-fourths inch and shall not be used for pressures exceeding 20 p.s.i.g. Aluminum alloy tubing shall not be installed within 6 inches of the ground.

(c) In systems where the gas in liquid form without pressure reduction enters the building, only heavy walled seamless brass or copper tubing with an internal diameter not greater than three thirty-seconds inch, and a wall thickness of not less than three sixty-fourths inch shall be used. This requirement shall not apply to research and experimental laboratories, buildings, or separate fire divisions of buildings used exclusively for housing internal combustion engines, and to commercial gas plants or bulk stations where containers are charged, nor to industrial vaporizer buildings, nor to buildings, structures, or equipment under construction or undergoing major renovation.

(d) Pipe joints may be screwed, flanged, welded, soldered, or brazed with a material having a melting point exceeding 1,000°F. Joints on seamless copper, brass, steel, or aluminum alloy gas tubing shall be made by means of approved gas tubing fittings, or soldered or brazed with a material having a melting point exceeding 1,000°F.

(e) For operating pressures of 125 p.s.i.g. or less, fittings shall be designed for a pressure of at least 125 p.s.i.g. For operating pressures above 125 p.s.i.g., fittings shall be designed for a minimum of 250 p.s.i.g.

(f) The use of threaded cast iron pipe fittings such as ells, tees, crosses, couplings, and unions is prohibited. Aluminum alloy fittings shall be used with aluminum alloy pipe and tubing. Insulated fittings shall be used

where aluminum alloy pipe or tubing connects with a dissimilar metal.

(g) Strainers, regulators, meters, compressors, pumps, etc., are not to be considered as pipe fittings. This does not prohibit the use of malleable, nodular, or higher strength gray iron for such equipment.

(h) All materials such as valve seats, packing, gaskets, diaphragms, etc., shall be of such quality as to be resistant to the action of liquefied petroleum gas under the service conditions to which they are subjected.

(i) All piping, tubing, or hose shall be tested after assembly and proved free from leaks at not less than normal operating pressures. After installation, piping and tubing of all domestic and commercial systems shall be tested and proved free of leaks using a manometer or equivalent device that will indicate a drop in pressure. Test shall not be made with a flame.

(j) Provision shall be made to compensate for expansion, contraction, jarring, and vibration, and for settling. This may be accomplished by flexible connections.

(k) Piping outside buildings may be buried, above ground, or both, but shall be well supported and protected against physical damage. Where soil conditions warrant, all piping shall be protected against corrosion. Where condensation may occur, the piping shall be pitched back to the container, or suitable means shall be provided for revaporization of the condensate.

(9) Hose Specifications. (a) Hose shall be fabricated of materials that are resistant to the action of LP-Gas in the liquid and vapor phases. If wire braid is used for reinforcing the hose, it shall be of corrosion-resistant material such as stainless steel.

(b) Hose subject to container pressure shall be marked "LP-Gas" or "LPG" at not greater than 10-foot intervals.

(c) Hose subject to container pressure shall be designed for a bursting pressure of not less than 1,250 p.s.i.g.

(d) Hose subject to container pressure shall have its correctness as to design construction and performance determined by being listed (see WAC 296-24-47501(15)).

(e) Hose connections subject to container pressure shall be capable of withstanding, without leakage, a test pressure of not less than 500 p.s.i.g.

(f) Hose and hose connections on the low-pressure side of the regulator or reducing valve shall be designed for a bursting pressure of not less than 125 p.s.i.g. or five times the set pressure of the relief devices protecting that portion of the system, whichever is higher.

(g) Hose may be used on the low-pressure side of regulators to connect to other than domestic and commercial gas appliances under the following conditions:

(i) The appliances connected with hose shall be portable and need a flexible connection.

(ii) For use inside buildings the hose shall be of minimum practical length, but shall not exceed 6 feet except as provided in WAC 296-24-47507(5)(a)(vii) and shall not extend from one room to another, nor pass through any walls, partitions, ceilings, or floors. Such hose shall

not be concealed from view or used in a concealed location. For use outside of buildings, the hose may exceed this length but shall be kept as short as practical.

(iii) The hose shall be approved and shall not be used where it is likely to be subjected to temperatures above 125°F. The hose shall be securely connected to the appliance and the use of rubber slip ends shall not be permitted.

(iv) The shutoff valve for an appliance connected by hose shall be in the metal pipe or tubing and not at the appliance end of the hose. When shutoff valves are installed close to each other, precautions shall be taken to prevent operation of the wrong valve.

(v) Hose used for connecting to wall outlets shall be protected from physical damage.

(10) Safety Devices. (a) Every container except those constructed in accordance with DOT specifications and every vaporizer (except motor fuel vaporizers and except vaporizers described in (11)(b)(iii) of this section and WAC 296-24-47509 (4)(e)(i)) whether heated by artificial means or not, shall be provided with one or more safety relief valves of spring-loaded or equivalent type. 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 the building which is below such discharge. The rate of discharge shall be in accordance with the requirements of (10)(b) of this section or (10)(c) of this section in the case of vaporizers.

(b) Minimum required rate of discharge in cubic feet per minute of air at 120 percent of the maximum permitted start to discharge pressure for safety relief valves to be used on containers other than those constructed in accordance with DOT specification shall be as follows:

Surface area (sq. ft.)	Flow rate CFM air
20 or less	626
25	751
30	872
35	990
40	1,100
45	1,220
50	1,330
55	1,430
60	1,540
65	1,640
70	1,750
75	1,850
80	1,950
85	2,050
90	2,150
95	2,240
100	2,340
105	2,440
110	2,530
115	2,630
120	2,720
125	2,810
130	2,900
135	2,990

Surface area (sq. ft.)	Flow rate CFM air
140	3,080
145	3,170
150	3,260
155	3,350
160	3,440
165	3,530
170	3,620
175	3,700
180	3,790
185	3,880
190	3,960
195	4,050
200	4,130
210	4,300
220	4,470
230	4,630
240	4,800
250	4,960
260	5,130
270	5,290
280	5,450
290	5,610
300	5,760
310	5,920
320	6,080
330	6,230
340	6,390
350	6,540
360	6,690
370	6,840
380	7,000
390	7,150
400	7,300
450	8,040
500	8,760
550	9,470
600	10,170
650	10,860
700	11,550
750	12,220
800	12,880
850	13,540
900	14,190
950	14,830
1,000	15,470
1,050	16,100
1,100	16,720
1,150	17,350
1,200	17,960
1,250	18,570
1,300	19,180
1,350	19,780
1,400	20,380
1,450	20,980
1,500	21,570
1,550	22,160
1,600	22,740
1,650	23,320

Surface area (sq. ft.)	Flow rate CFM air
1,700	23,900
1,750	24,470
1,800	25,050
1,850	25,620
1,900	26,180
1,950	26,750
2,000	27,310

Surface area = total outside surface area of container in square feet.

When the surface area is not stamped on the nameplate or when the marking is not legible, the area can be calculated by using one of the following formulas:

(1) Cylindrical container with hemispherical heads:

$$\text{Area} = \text{Overall length} \times \text{outside diameter} \times 3.1416.$$

(2) Cylindrical container with other than hemispherical heads:

$$\text{Area} = (\text{Overall length} + 0.3 \text{ outside diameter}) \times \text{outside diameter} \times 3.1416.$$

NOTE: This formula is not exact, but will give results within the limits of practical accuracy for the sole purpose of sizing relief valves.

(3) Spherical container:

$$\text{Area} = \text{Outside diameter squared} \times 3.1416.$$

Flow Rate—CFM Air = Required flow capacity in cubic feet per minute of air at standard conditions, 60F. and atmospheric pressure (14.7 p.s.i.a.).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2,000 square feet, the required flow rate can be calculate [calculated] using the formula, Flow Rate—CFM Air = 53.632 A(superscript 0.82).

$$A = \text{Total outside surface area of the container in square feet.}$$

Valves not marked "Air" have flow rate marking in cubic feet per minute of liquefied petroleum gas. These can be converted to ratings in cubic feet per minute of air by multiplying the liquefied petroleum gas ratings by factors listed below. Air flow ratings can be converted to ratings in cubic feet per minute of liquefied petroleum gas by dividing the air ratings by the factors listed below.

AIR CONVERSION FACTORS

Container type	100	125	150	175	200
Air conversion factor	1.162	1.142	1.113	1.078	1.010

(c) Minimum Required Rate of Discharge for Safety Relief Valves for Liquefied Petroleum Gas Vaporizers (Steam Heated, Water Heated, and Direct Fired).

The minimum required rate of discharge for safety relief valves shall be determined as follows:

(i) Obtain the total surface area by adding the surface area of vaporizer shell in square feet directly in contact with LP-Gas and the heat exchanged surface area in square feet directly in contact with LP-Gas.

(ii) Obtain the minimum required rate of discharge in cubic feet of air per minute, at 60°F. and 14.7 p.s.i.a. from (10)(b) of this section, for this total surface area.

(d) Container and vaporizer safety relief valves shall be set to start-to-discharge, with relation to the design pressure of the container, in accordance with Table H-26.

TABLE H-26

Containers	Minimum (percent)	Maximum (percent)
ASME Code; Par. U-68, U-69—1949 and earlier editions	110	¹ 125
ASME Code; Par. U-200, U-201—1949 edition	88	¹ 100
ASME Code—1950, 1952, 1956, 1959, 1962, 1965 and 1968 (Division I) editions	88	¹ 100
API—ASME Code—all editions	88	¹ 100
DOT—As prescribed in 49 CFR Chapter I—		

¹Manufacturers of safety relief valves are allowed a plus tolerance not exceeding 10 percent of the set pressure marked on the valve.

(e) Safety relief devices used with systems employing containers other than those constructed according to DOT specifications shall be so constructed as to discharge at not less than the rates shown in (10)(b) of this section, before the pressure is in excess of 120 percent of the maximum (not including the 10 percent referred to in (10)(d) of this section) permitted start to discharge pressure setting of the device.

(f) In certain locations sufficiently sustained high temperatures prevail which require the use of a lower vapor pressure product to be stored or the use of a higher designed pressure vessel in order to prevent the safety valves opening as the result of these temperatures. As an alternative the tanks may be protected by cooling

devices such as by spraying, by shading, or other effective means.

(g) Safety relief valves shall be arranged so that the possibility of tampering will be minimized. If pressure setting or adjustment is external, the relief valves shall be provided with approved means for sealing adjustment.

(h) Shutoff valves shall not be installed between the safety relief devices 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.

(i) Safety relief valves shall have direct communication with the vapor space of the container at all times.

(j) Each container safety relief valve used with systems covered by WAC 296-24-47509, WAC 296-24-47511, WAC 296-24-47515 and WAC 296-24-47517, except as provided in WAC 296-24-47511(3)(c) shall be plainly and permanently marked with the following: "Container Type" of the pressure vessel on which the valve is designed to be installed; the pressure in p.s.i.g. at which the valve is set to discharge; the actual rate of discharge of the valve in cubic feet per minute of air at 60°F. and 14.7 p.s.i.a.; and the manufacturer's name and catalog number, for example: T200-250-4050 AIR—indicating that the valve is suitable for use on a Type 200 container, that it is set to start to discharge at 250 p.s.i.g.; and that its rate of discharge is 4,050 cubic feet per minute of air as determined in (10)(b) of this section.

(k) Safety relief valve assemblies, including their connections, shall be of sufficient size so as to provide the rate of flow required for the container on which they are installed.

(l) A hydrostatic relief valve shall be installed between each pair of shutoff valves on liquefied petroleum gas liquid piping so as to relieve into a safe atmosphere. The start-to-discharge pressure setting of such relief valves shall not be in excess of 500 p.s.i.g. The minimum setting on relief valves installed in piping connected to other than DOT containers shall not be lower than 140 percent of the container relief valve setting and in piping connected to DOT containers not lower than 400 p.s.i.g. Such a relief valve should not be installed in the pump discharge piping if the same protection can be provided by installing the relief valve in the suction piping. The start-to-discharge pressure setting of such a relief valve, if installed on the discharge side of a pump, shall be greater than the maximum pressure permitted by the recirculation device in the system.

(m) The discharge from any safety relief device shall not terminate in or beneath any building, except relief devices covered by (6)(a)(i) to (vi) of this section, or WAC 296-24-47507(4)(a) or (5).

(n) Container safety relief devices and regulator relief vents shall be located not less than five (5) feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(11) Vaporizer and Housing. (a) Indirect fired vaporizers utilizing steam, water, or other heating medium shall be constructed and installed as follows:

(i) Vaporizers shall be constructed in accordance with the requirements of (3)(a) to (c) of this section and shall be permanently marked as follows:

(A) With the code marking signifying the specifications to which the vaporizer is constructed.

(B) With the allowable working pressure and temperature for which the vaporizer is designed.

(C) With the sum of the outside surface area and the inside heat exchange surface area expressed in square feet.

(D) With the name or symbol of the manufacturer.

(ii) Vaporizers having an inside diameter of 6 inches or less exempted by the ASME Unfired Pressure Vessel Code, Section VIII of the ASME Boiler and Pressure Vessel Code—1968 shall have a design pressure not less than 250 p.s.i.g. and need not be permanently marked.

(iii) Heating or cooling coils shall not be installed inside a storage container.

(iv) Vaporizers may be installed in buildings, rooms, sheds, or lean-tos used exclusively for gas manufacturing or distribution, or in other structures of light, non-combustible construction or equivalent, well ventilated near the floor line and roof.

When vaporizing and/or mixing equipment is located in a structure or building not used exclusively for gas manufacturing or distribution, either attached to or within such a building, such structure or room shall be separated from the remainder of the building by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall shall have no openings or pipe or conduit passing through it. Such structure or room shall be provided with adequate ventilation and shall have a roof or at least one exterior wall of light-weight construction.

(v) Vaporizers shall have, at or near the discharge, a safety relief valve providing an effective rate of discharge in accordance with (10)(c) of this section, except as provided in WAC 296-24-47509(4)(e)(i).

(vi) The heating medium lines into and leaving the vaporizer shall be provided with suitable means for preventing the flow of gas into the heat systems in the event of tube rupture in the vaporizer. Vaporizers shall be provided with suitable automatic means to prevent liquid passing through the vaporizers to the gas discharge piping.

(vii) The device that supplies the necessary heat for producing steam, hot water, or other heating medium may be installed in a building, compartment, room, or lean-to which shall be ventilated near the floorline and roof to the outside. The device location shall be separated from all compartments or rooms containing liquefied petroleum gas vaporizers, pumps, and central gas mixing devices by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall shall have no openings or pipes or conduit passing through it. This requirement does not apply to the domestic water heaters which may supply heat for a vaporizer in a domestic system.

(viii) Gas-fired heating systems supplying heat exclusively for vaporization purposes shall be equipped with automatic safety devices to shut off the flow of gas to main burners, if the pilot light should fail.

(ix) Vaporizers may be an integral part of a fuel storage container directly connected to the liquid section or gas section or both.

(x) Vaporizers shall not be equipped with fusible plugs.

(xi) Vaporizer houses shall not have unprotected drains to sewers or sump pits.

(b) Atmospheric vaporizers employing heat from the ground or surrounding air shall be installed as follows:

(i) Buried underground, or

(ii) Located inside the building close to a point at which pipe enters the building provided the capacity of the unit does not exceed 1 quart.

(iii) Vaporizers of less than 1 quart capacity heated by the ground or surrounding air, need not be equipped with safety relief valves provided that adequate tests demonstrate that the assembly is safe without safety relief valves.

(c) Direct gas-fired vaporizers shall be constructed, marked, and installed as follows:

(i) In accordance with the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code—1968 that are applicable to the maximum working conditions for which the vaporizer is designed.

(ii) With the name of the manufacturer; rated BTU input to the burner; the area of the heat exchange surface in square feet; the outside surface of the vaporizer in square feet; and the maximum vaporizing capacity in gallons per hour.

(iii) Vaporizers may be connected to the liquid section or the gas section of the storage container, or both; but in any case there shall be at the container a manually operated valve in each connection to permit completely shutting off when desired, of all flow of gas or liquid from container to vaporizer.

(iv) Vaporizers with capacity not exceeding 35 gallons per hour shall be located at least 5 feet from container shutoff valves. Vaporizers having capacity of more than 35 gallons but not exceeding 100 gallons per hour shall be located at least 10 feet from the container shutoff valves. Vaporizers having a capacity greater than 100 gallons per hour shall be located at least 15 feet from container shutoff valves.

(v) Vaporizers may be installed in buildings, rooms, housings, sheds, or lean-tos used exclusively for vaporizing or mixing of liquefied petroleum gas. Vaporizing housing structures shall be of noncombustible construction, well ventilated near the floorline and the highest point of the roof. When vaporizer and/or mixing equipment is located in a structure or room attached to or within a building, such structure or room shall be separated from the remainder of the building by a wall designed to withstand a static pressure of at least 100 pounds per square foot. This wall shall have no openings or pipes or conduit passing through it. Such structure or room shall be provided with adequate ventilation, and shall have a roof or at least one exterior wall of light-weight construction.

(vi) Vaporizers shall have at or near the discharge, a safety relief valve providing an effective rate of discharge in accordance with (10)(c) of this section. The

relief valve shall be so located as not to be subjected to temperatures in excess of 140°F.

(vii) Vaporizers shall be provided with suitable automatic means to prevent liquid passing from the vaporizer to the gas discharge piping of the vaporizer.

(viii) Vaporizers shall be provided with means for manually turning off the gas to the main burner and pilot.

(ix) Vaporizers shall be equipped with automatic safety devices to shut off the flow of gas to main burners if the pilot light should fail. When the flow through the pilot exceeds 2,000 B.t.u. per hour, the pilot also shall be equipped with an automatic safety device to shut off the flow of gas to the pilot should the pilot flame be extinguished.

(x) Pressure regulating and pressure reducing equipment if located within 10 feet of a direct fired vaporizer shall be separated from the open flame by a substantially airtight noncombustible partition or partitions.

(xi) Except as provided in (11)(c)(v), of this section, the following minimum distances shall be maintained between direct fired vaporizers and the nearest important building or group of buildings or line of adjoining property which may be built upon:

Ten feet for vaporizers having a capacity of 15 gallons per hour or less vaporizing capacity.

Twenty-five feet for vaporizers having a vaporizing capacity of 16 to 100 gallons per hour.

Fifty feet for vaporizers having a vaporizing capacity exceeding 100 gallons per hour.

(xii) Direct fired vaporizers shall not raise the product pressure above the design pressure of the vaporizer equipment nor shall they raise the product pressure within the storage container above the pressure shown in the second column of Table H-31. (See WAC 296-24-47509.)

(xiii) Vaporizers shall not be provided with fusible plugs.

(xiv) Vaporizers shall not have unprotected drains to sewers or sump pits.

(d) Direct gas-fired tank heaters, shall be constructed and installed as follows:

(i) Direct gas-fired tank heaters, and tanks to which they are applied, shall only be installed above ground.

(ii) Tank heaters shall be permanently marked with the name of the manufacturer, the rated B.t.u. input to the burner, and the maximum vaporizing capacity in gallons per hour.

NOTE: Tank heaters may be an integral part of a fuel storage container directly connected to the container liquid section, or vapor section, or both.

(iii) Tank heaters shall be provided with a means for manually turning off the gas to the main burner and pilot.

(iv) Tank heaters shall be equipped with an automatic safety device to shut off the flow of gas to main burners, if the pilot light should fail. When flow through pilot exceeds 2,000 B.t.u. per hour, the pilot also shall be equipped with an automatic safety device to shut off the

flow of gas to the pilot should the pilot flame be extinguished.

(v) Pressure regulating and pressure reducing equipment if located within 10 feet of a direct fired tank heater shall be separated from the open flame by a substantially airtight noncombustible partition.

(vi) The following minimum distances shall be maintained between a storage tank heated by a direct fired tank heater and the nearest important building or group of buildings or line of adjoining property which may be built upon:

Ten feet for storage containers of less than 500 gallons water capacity.

Twenty-five feet for storage containers of 500 to 1,200 gallons water capacity.

Fifty feet for storage containers of over 1,200 gallons water capacity.

(vii) No direct fired tank heater shall raise the product pressure within the storage container over 75 percent of the pressure set out in the second column of Table H-31. (See WAC 296-24-47509.)

(e) The vaporizer section of vaporizer-burners used for dehydrators or dryers shall be located outside of buildings; they shall be constructed and installed as follows:

(i) Vaporizer-burners shall have a minimum design pressure of 250 p.s.i.g. with a factor of safety of five.

(ii) Manually operated positive shutoff valves shall be located at the containers to shut off all flow to the vaporizer-burners.

(iii) Minimum distances between storage containers and vaporizer-burners shall be as follows:

Water capacity per container (gallons)	Minimum distances (feet)
Less than 501	10
501 to 2,000	25
Over 2,000	50

(iv) The vaporizer section of vaporizer-burners shall be protected by a hydrostatic relief valve. The relief valve shall be located so as not to be subjected to temperatures in excess of 140°F. The start-to-discharge pressure setting shall be such as to protect the components involved, but not less than 250 p.s.i.g. The discharge shall be directed upward and away from component parts of the equipment and away from operating personnel.

(v) Vaporizer-burners shall be provided with means for manually turning off the gas to the main burner and pilot.

(vi) Vaporizer-burners shall be equipped with automatic safety devices to shut off the flow of gas to the main burner and pilot in the event the pilot is extinguished.

(vii) Pressure regulating and control equipment shall be located or protected so that the temperatures surrounding this equipment shall not exceed 140°F. except that equipment components may be used at higher temperatures if designed to withstand such temperatures.

(viii) Pressure regulating and control equipment when located downstream of the vaporizer shall be designed to

withstand the maximum discharge temperature of the vapor.

(ix) The vaporizer section of vaporizer-burners shall not be provided with fusible plugs.

(x) Vaporizer coils or jackets shall be made of ferrous metal or high temperature alloys.

(xi) Equipment utilizing vaporizer-burners shall be equipped with automatic shutoff devices upstream and downstream of the vaporizer section connected so as to operate in the event of excessive temperature, flame failure, and, if applicable, insufficient airflow.

(12) Filling densities. (a) The "filling density" is defined as the percent ratio of the weight of the gas in a container to the weight of water the container will hold at 60°F. All containers shall be filled according to the filling densities shown in Table H-27.

TABLE H-27
MAXIMUM PERMITTED FILLING DENSITY

Specific gravity at 60°F. (15.6°C.)	Above ground containers		Under-ground containers, all capacities
	0 to 1,200 U.S. gals. (1,000 imp. gal. total water cap.	Over 1,200 U.S. gals. (1,000 imp. gals. total water cap.	
	Percent	Percent	Percent
0.496-0.503	41	44	45
.504-.510	42	45	46
.511-.519	43	46	47
.520-.527	44	47	48
.528-.536	45	48	49
.537-.544	46	49	50
.545-.552	47	50	51
.553-.560	48	51	52
.561-.568	49	52	53
.569-.576	50	53	54
.577-.584	51	54	55
.585-.592	52	55	56
.593-.600	53	56	57

(b) Except as provided in (12)(c) of this section, any container including mobile cargo tanks and portable tank containers regardless of size or construction, shipped under DOT jurisdiction or constructed in accordance with 49 CFR Chapter I Specifications shall be charged according to 49 CFR Chapter I requirements.

(c) Portable containers not subject to DOT jurisdiction (such as, but not limited to, motor fuel containers on industrial and lift trucks, and farm tractors covered in (5) of this section, or containers recharged at the installation) may be filled either by weight, or by volume using a fixed length dip tube gaging device.

(13) LP-Gas in buildings. (a) Vapor shall be piped into buildings at pressures in excess of 20 p.s.i.g. only if

the buildings or separate areas thereof, (i) are constructed in accordance with this section; (ii) are used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard; (iii) buildings, structures, or equipment under construction or undergoing major renovation.

(b) Liquid may be permitted in buildings as follows:

(i) Buildings, or separate areas of buildings, used exclusively to house equipment for vaporization, pressure reduction, gas mixing, gas manufacturing, or distribution, or to house internal combustion engines, industrial processes, research and experimental laboratories, or equipment and processes using such gas and having similar hazard; and when such buildings, or separate areas thereof are constructed in accordance with this section.

(ii) Buildings, structures, or equipment under construction or undergoing major renovation provided the temporary piping meets the following conditions:

(A) Liquid piping inside the building shall conform to the requirements of (8) of this section, and shall not exceed three-fourths iron pipe size. Copper tubing with an outside diameter of three-fourths inch or less may be used provided it conforms to Type K of Specifications for Seamless Water Tube, ANSI H23.1-1970 (ASTM B88-1969) (See WAC 296-24-47505 Table H-24). All such piping shall be protected against construction hazards. Liquid piping inside buildings shall be kept to a minimum. Such piping shall be securely fastened to walls or other surfaces so as to provide adequate protection from breakage and so located as to subject the liquid line to lowest ambient temperatures.

(B) A shutoff valve shall be installed in each intermediate branch line where it takes off the main line and shall be readily accessible. A shutoff valve shall also be placed at the appliance end of the intermediate branch line. Such shutoff valve shall be upstream of any flexible connector used with the appliance.

(C) Suitable excess flow valves shall be installed in the container outlet line supplying liquid LP-Gas to the building. A suitable excess flow valve shall be installed immediately downstream of each shutoff valve. Suitable excess flow valves shall be installed where piping size is reduced and shall be sized for the reduced size piping.

(D) Hydrostatic relief valves shall be installed in accordance with (10)(1) of this section.

(E) The use of hose to carry liquid between the container and the building or at any point in the liquid line, except at the appliance connector, shall be prohibited.

(F) Where flexible connectors are necessary for appliance installation, such connectors shall be as short as practicable and shall comply with (8)(b) or (9) of this section.

(G) Release of fuel when any section of piping or appliances is disconnected shall be minimized by either of the following methods:

(aa) Using an approved automatic quick-closing coupling (a type closing in both directions when coupled in the fuel line), or

(bb) Closing the valve nearest to the appliance and allowing the appliance to operate until the fuel in the line is consumed.

(cc) Portable containers shall not be taken into buildings except as provided in (6)(a) of this section.

(14) Transfer of Liquids. The employer shall assure that (a) at least one attendant shall remain close to the transfer connection from the time the connections are first made until they are finally disconnected, during the transfer of the product.

(b) Containers shall be filled or used only upon authorization of the owner.

(c) Containers manufactured in accordance with specifications of 49 CFR Part 178 and authorized by 49 CFR Chapter 1 as a "single trip" or "nonrefillable container" shall not be refilled or reused in LP-Gas service.

(d) Gas or liquid shall not be vented to the atmosphere to assist in transferring contents of one container to another, except as provided in WAC 296-24-47511(5)(d) and except that this shall not preclude the use of listed pump utilizing LP-Gas in the vapor phase as a source of energy and venting such gas to the atmosphere at a rate not to exceed that from a No. 31 drill size opening and provided that such venting and liquid transfer shall be located not less than 50 feet from the nearest important building.

(e) Filling of fuel containers for industrial trucks or motor vehicles from industrial bulk storage containers shall be performed not less than 10 feet from the nearest important masonry-walled building or not less than 25 feet from the nearest important building or other construction and, in any event, not less than 25 feet from any building opening.

(f) Filling of portable containers, containers mounted on skids, fuel containers on farm tractors, or similar applications, from storage containers used in domestic or commercial service, shall be performed not less than 50 feet from the nearest important building.

(g) The filling connection and the vent from the liquid level gages in containers, filled at point of installation, shall not be less than 10 feet in any direction from air openings into sealed combustion system appliances or mechanical ventilation air intakes.

(h) Fuel supply containers shall be gaged and charged only in the open air or in buildings especially provided for that purpose.

(i) The maximum vapor pressure of the product at 100°F. which may be transferred into a container shall be in accordance with WAC 296-24-47509(2) and WAC 296-24-47511(3). (For DOT containers use DOT requirements.)

(j) Marketers and users shall exercise precaution to assure that only those gases for which the system is designed, examined, and listed, are employed in its operation, particularly with regard to pressures.

(k) Pumps or compressors shall be designed for use with LP-Gas. When compressors are used they shall normally take suction from the vapor space of the container being filled and discharge to the vapor space of the container being emptied.

(l) Pumping systems, when equipped with a positive displacement pump, shall include a recirculating device

which shall limit the differential pressure on the pump under normal operating conditions to the maximum differential pressure rating of the pump. The discharge of the pumping system shall be protected so that pressure does not exceed 350 p.s.i.g. If a recirculation system discharges into the supply tank and contains a manual shutoff valve, an adequate secondary safety recirculation system shall be incorporated which shall have no means of rendering it inoperative. Manual shutoff valves in recirculation systems shall be kept open except during an emergency or when repairs are being made to the system.

(m) When necessary, unloading piping or hoses shall be provided with suitable bleeder valves for relieving pressure before disconnection.

(n) Agricultural air moving equipment, including crop dryers, shall be shut down when supply containers are being filled unless the air intakes and sources of ignition on the equipment are located 50 feet or more from the container.

(o) Agricultural equipment employing open flames or equipment with integral containers, such as flame cultivators, weed burners, and, in addition, tractors, shall be shut down during refueling.

(15) Tank Car or Transport Truck Loading or Unloading Points and Operations. (a) The track of tank car siding shall be relatively level.

(b) A "Tank Car Connected" sign, as covered by DOT rules, shall be installed at the active end or ends of the siding while the tank car is connected.

(c) While cars are on side track for loading or unloading, the wheels at both ends shall be blocked on the rails.

(d) The employer shall insure that an employee is in attendance at all times while the tank car, cars, or trucks are being loaded or unloaded.

(e) A backflow check valve, excess-flow valve, or a shutoff valve with means of remote closing, to protect against uncontrolled discharge of LP-Gas from storage tank piping shall be installed close to the point where the liquid piping and hose or swing joint pipe is connected.

(f) Except as provided in (15)(g) of this section, when the size (diameter) of the loading or unloading hoses and/or piping is reduced below the size of the tank car or transport truck loading or unloading connections, the adaptors to which lines are attached shall be equipped with either a backflow check valve, a properly sized excess flow valve, or shutoff valve with means of remote closing, to protect against uncontrolled discharge from the tank car or transport truck.

(g) The requirement of (15)(f) of this section shall not apply if the tank car or transport is equipped with a quick-closing internal valve that can be remotely closed.

(h) The tank car or transport truck loading or unloading point shall be located with due consideration to the following:

(i) Proximity to railroads and highway traffic.

(ii) The distance of such unloading or loading point from adjacent property.

(iii) With respect to buildings on installer's property.

(iv) Nature of occupancy.

(v) Topography.

- (vi) Type of construction of buildings.
- (vii) Number of tank cars or transport trucks that may be safely loaded or unloaded at one time.
- (viii) Frequency of loading or unloading.
- (i) Where practical, the distance of the unloading or loading point shall conform to the distances in (6)(b) of this section.

(16) Instructions. Personnel performing installation, removal, operation, and maintenance work shall be properly trained in such function.

(17) Electrical Equipment and Other Sources of Ignition. (a) Electrical equipment and wiring shall be of a type specified by and shall be installed in accordance with WAC 296-24-950 and WAC 296-24-955, for ordinary locations except that fixed electrical equipment in classified areas shall comply with (18) of this section.

(b) Open flames or other sources of ignition shall not be permitted in vaporizer rooms (except those housing direct-fired vaporizers), pumphouses, container charging rooms or other similar locations. Direct-fired vaporizers shall not be permitted in pumphouses or container charging rooms.

NOTE: Liquefied petroleum gas storage containers do not require lightning protection. Since liquefied petroleum gas is contained in a closed system of piping and equipment, the system need not be electrically conductive or electrically bonded for protection against static electricity (see NFPA No. 77-1972-1973, Recommended Practice for Static Electricity).

(c) Open flames (except as provided for in (17)(b) of this section), cutting or welding, portable electric tools, and extension lights capable of igniting LP-Gas, shall not be permitted within classified areas specified in Table H-28 (see WAC 296-24-47505) unless the LP-Gas facilities have been freed of all liquid and vapor, or special precautions observed under carefully controlled conditions.

(18) Fixed Electrical Equipment in Classified Areas. Fixed electrical equipment and wiring installed within classified areas shall comply with Table H-28 (see WAC 296-24-47505) and shall be installed in accordance with WAC 296-24-950 and WAC 296-24-955. This provision does not apply to fixed electrical equipment at residential or commercial installations of LP-Gas systems or to systems covered by WAC 296-24-47511 or WAC 296-24-47515.

(19) Liquid-Level Gaging Device. (a) Each container manufactured after December 31, 1965, and filled on a volumetric basis shall be equipped with a fixed liquid-level gage to indicate the maximum permitted filling level as provided in (19)(e) of this section. Each container manufactured after December 31, 1969, shall have permanently attached to the container adjacent to the fixed level gage a marking showing the percentage full that will be shown by that gage. When a variable liquid-level gage is also provided, the fixed liquid-level gage will also serve as a means for checking the variable gage. These gages shall be used in charging containers as required in (12) of this section.

(b) All variable gaging devices shall be arranged so that the maximum liquid level for butane, for a 50-50 mixture of butane and propane, and for propane, to which the container may be charged is readily determinable. The markings indicating the various liquid levels from empty to full shall be on the system nameplate or gaging device or part may be on the system nameplate and part on the gaging device. Dials of magnetic or rotary gages shall show whether they are for cylindrical or spherical containers and whether for aboveground or underground service. The dials of gages intended for use only on aboveground containers of over 1,200 gallons water capacity shall be so marked.

(c) Gaging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be designed so that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with excess flow valve.

(d) Gaging devices shall have a design working pressure of at least 250 p.s.i.g.

(e) Length of tube or position of fixed liquid-level gage shall be designed to indicate the maximum level to which the container may be filled for the product contained. This level shall be based on the volume of the product at 40°F. at its maximum permitted filling density for aboveground containers and at 50°F. for underground containers. The employer shall calculate the filling point for which the fixed liquid level gage shall be designed according to the method in this subsection.

TABLE H-28

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²
A	Storage containers other than DOT cylinders.	Within 15 feet in all directions from connections, except connections otherwise covered in Table H-28.	Division 2.
B	Tank vehicle and tank car loading and unloading. ³	Within 5 feet in all directions from connections regularly made or disconnected for product transfer.	Division 1.
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade. (See Figure H-1).	Division 2.

TABLE H-28

TABLE H-28

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²			
C	Gage vent openings other than those on DOT cylinders.	Within 5 feet in all directions from point of discharge.	Division 1.			
		Beyond 5 feet but within 15 feet in all directions from point of discharge.	Division 2.			
D	Relief valve discharge other than those on DOT cylinders.	Within direct path of discharge.	Division 1. NOTE—Fixed electrical equipment should preferably not be installed.			
		Within 5 feet in all directions from point of discharge.	Division 1.			
		Beyond 5 feet but within 15 feet in all directions from point of discharge except within the direct path of discharge.	Division 2.			
E	Pumps, compressors, gas-air mixers and vaporizers other than direct fired.					
				Indoors without ventilation	Entire room and any adjacent room not separated by a gastight partition.	Division 1.
					Within 15 feet of the exterior side of any exterior wall or roof that is not vaportight or within 15 feet of any exterior opening.	Division 2.
				Indoors with adequate ventilation ⁴	Entire room and any adjacent room not separated by a gastight partition.	Division 2.
	Outdoors in open air at or abovegrade.	Within 15 feet in all directions from this equipment and within the cylindrical volume between the horizontal equator of the sphere and grade. See Figure H-1.	Division 2.			

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²			
F	Service Station Dispensing Units.	Entire space within dispenser enclosure, and 18 inches horizontally from enclosure exterior up to an elevation 4 ft. above dispenser base. Entire pit or open space beneath dispenser.	Division 1.			
		Up to 18 inches abovegrade within 20 ft. horizontally from any edge of enclosure.	Division 2.			
NOTE: For pits within this area, see Part F of this table.						
G	Pits or trenches containing or located beneath LP-Gas valves, pumps, compressors, regulators, and similar equipment.					
				Without mechanical ventilation.	Entire pit or trench — Division 1.	
					Entire room and any adjacent room not separated by a gastight partition.	Division 2.
					Within 15 feet in all directions from pit or trench when located outdoors.	Division 2.
	With adequate mechanical ventilation.	Entire pit or trench —	Division 2.			
		Entire room and any adjacent room not separated by a gastight partition.	Division 2.			
		Within 15 feet in all directions from pit or trench when located outdoors.	Division 2.			
H	Special buildings or rooms for storage of portable containers.	Entire room —	Division 2.			
I	Pipelines and connections containing operational bleeds, drips, vents or drains.	Within 5 ft. in all directions from point of discharge.	Division 1.			
		Beyond 5 ft. from point of discharge, same as Part E of this table.				

TABLE H-28

Part	Location	Extent of classified area ¹	Equipment shall be suitable for National Electrical Code, Class 1, Group D ²
J	Container filling:		
	Indoors without ventilation.	Entire room	Division 1.
	Indoors with adequate ventilation ⁴	Within 5 feet in all directions from connections regularly made or disconnected for product transfer.	Division 1.
		Beyond 5 feet and entire room	Division 2.
Outdoors in open air -		Within 5 feet in all directions from connections regularly made or disconnected for product transfer.	Division 1.
		Beyond 5 feet but within 15 feet in all directions from a point where connections are regularly made or disconnected and within the cylindrical volume between the horizontal equator of the sphere and grade (See Fig. H-1.)	Division 2.

¹The classified area shall not extend beyond an unpierced wall, roof, or solid vaportight partition.

²See chapter 296-46 WAC, and WAC 296-24-950 and 296-24-955.

³When classifying extent of hazardous area, consideration shall be given to possible variations in the spotting of tank cars and tank vehicles at the unloading points and the effect these variations of actual spotting point may have on the point of connection.

⁴Ventilation, either natural or mechanical, is considered adequate when the concentration of the gas in a gas-air mixture does not exceed 25 percent of the lower flammable limit under normal operating conditions.

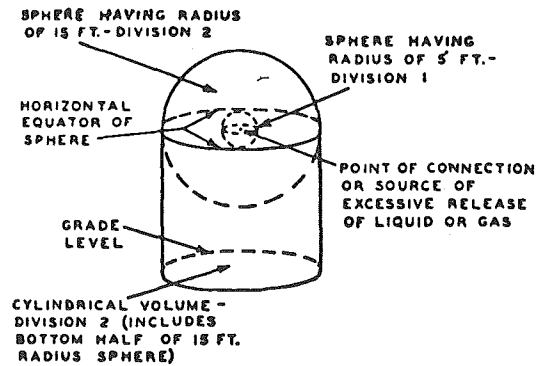


Figure H-1

NOTE: It is impossible to set out in a table the length of a fixed dip tube for various capacity tanks because of the varying tank diameters and lengths and because the tank may be installed either in a vertical or horizontal position. Knowing the maximum permitted filling volume in gallons, however, the length of the fixed tube can be determined by the use of a strapping table obtained from the container manufacturer. The length of the fixed tube should be such that when its lower end touches the surface of the liquid in the container, the contents of the container will be the maximum permitted volume as determined by the following formula:

$$\frac{\text{Water capacity (gals.) of container}^* \times \text{filling density}^{**}}{\text{Specific gravity of LP-Gas}^* \times \text{volume correction factor}^{***} \times 100} = \frac{\text{Maximum volume of LP-Gas}}$$

*Measure at 60°F.

**From (12(a)) of this section "Filling Densities."

***For aboveground containers the liquid temperature is assumed to be 40°F. and for underground containers the liquid temperature is assumed to be 50°F. To correct the liquid volumes at these temperatures to 60°F. the following factors shall be used.

(i) Formula for determining maximum volume of liquefied petroleum gas for which a fixed length of dip tube shall be set:

TABLE H-29
VOLUME CORRECTION FACTORS

Specific gravity	Aboveground	Underground
0.500	1.033	1.017
.510	1.031	1.016

TABLE H-29
VOLUME CORRECTION FACTORS

Specific gravity	Aboveground	Underground
.520	1.029	1.015
.530	1.028	1.014
.540	1.026	1.013
.550	1.025	1.013
.560	1.024	1.012
.570	1.023	1.011
.580	1.021	1.011
.590	1.020	1.010

	Aboveground, pounds per gallon	Underground, pounds per gallon
Propane	4.37	4.31
N Butane	4.97	4.92

(ii) The maximum volume of LP-Gas which can be placed in a container when determining the length of the dip tube expressed as a percentage of total water content of the container is calculated by the following formula.

(iii) The maximum weight of LP-Gas which may be placed in a container for determining the length of a fixed dip tube is determined by multiplying the maximum volume of liquefied petroleum gas obtained by the formula in (19)(e)(i) of this section by the pounds of liquefied petroleum gas in a gallon at 40°F. for aboveground and at 50°F. for underground containers. For example, typical pounds per gallon are specified below:

Example: Assume a 100-gallon total water capacity tank for aboveground storage of propane having a specific gravity of 0.510 of 60°F.

$$\begin{array}{r} 100 \text{ (gals.)} \times 42 \text{ (filling density} \\ \text{from (12)(a) of this section)} \\ \hline 0.510 \times 1.031 \text{ (correction factor} \\ \text{from Table H-29)} \times 100 \end{array} = \frac{4200}{52.6}$$

$$\frac{4200}{52.6} = \frac{79.8 \text{ gallons propane, the maximum amount permitted to be placed in a 100-gallon total water capacity aboveground container equipped with a fixed dip tube.}}{100}$$

$$\frac{\text{Maximum volume of LP-Gas (from formula in (19)(e)(i) of this section)} \times 100}{\text{Total water content of container in gallons.}} = \frac{\text{Maximum percent of LP-Gas}}{\text{Total water content of container in gallons.}}$$

(f) Fixed liquid-level gages used on containers other than DOT containers shall be stamped on the exterior of the gage with the letters "DT" followed by the vertical distance (expressed in inches and carried out to one decimal place) from the top of container to the end of the dip tube or to the centerline of the gage when it is located at the maximum permitted filling level. For portable containers that may be filled in the horizontal and/or vertical position the letters "DT" shall be followed by "V" with the vertical distance from the top of the container to the end of the dip tube for vertical filling and with "H" followed by the proper distance for horizontal filling. For DOT containers the stamping shall be placed both on the exterior of the gage and on the container. On aboveground or cargo containers where the gages are positioned at specific levels, the marking may be specified in percent of total tank contents and the marking shall be stamped on the container.

(g) Gage glasses of the columnar type shall be restricted to charging plants where the fuel is withdrawn in the liquid phase only. They shall be equipped with valves having metallic handwheels, with excess flow valves, and with extra-heavy glass adequately protected with a metal housing applied by the gage manufacturer. They shall be shielded against the direct rays of the sun. Gage glasses of the columnar type are prohibited on tank trucks, and on motor fuel tanks, and on containers used in domestic, commercial, and industrial installations.

(h) Gaging devices of the float, or equivalent type which do not require flow for their operation and having connections extending to a point outside the container do not have to be equipped with excess flow valves provided the piping and fittings are adequately designed to withstand the container pressure and are properly protected against physical damage and breakage.

(20) Requirements for Appliances. (a) Except as provided in (20)(b) of this section, new commercial and industrial gas consuming appliances shall be approved.

(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.

(c) Unattended heaters used inside buildings for the purpose of animal or poultry production or care shall be equipped with an approved automatic device designed to shut off the flow of gas to the main burners, and pilot if used, in the event of flame extinguishment.

(d) All commercial, industrial, and agricultural appliances or equipment shall be installed in accordance with

the requirements of these standards and in accordance with the following:

(i) Domestic and commercial appliances—NFPA 54-1969, Standard for the Installation of Gas Appliances and Gas Piping.

(ii) Industrial appliances—NFPA 54A-1969, Standard for the Installation of Gas Piping and Gas Equipment on Industrial Premises and Certain Other Premises.

(iii) Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines—NFPA 37-1970.

(iv) Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment, NFPA 96-1970. [Order 76-6, § 296-24-47505, filed 3/1/76; Order 73-5, § 296-24-47505, filed 5/9/73 and Order 73-4, § 296-24-47505, filed 5/7/73.]

WAC 296-24-47507 Cylinder systems. (1) Application. This section applies specifically to systems utilizing containers constructed in accordance with DOT Specifications. All requirements of WAC 296-24-47505 apply to this section unless otherwise noted in WAC 296-24-47505.

(2) Marking of Containers. (a) Containers shall be marked in accordance with DOT regulations. Additional markings not in conflict with DOT regulations may be used.

(b) Except as provided in (2)(c) of this section each container shall be marked with its water capacity in pounds or other identified unit of weight.

(c) If a container is filled and maintained only by the owner or his representative and if the water capacity of each container is identified by a code, compliance with (2)(b) of this section is not required.

(d) Each container shall be marked with its tare weight in pounds or other identified unit of weight including all permanently attached fittings but not the cap.

(3) Description of a System. A system shall include the container base or bracket, containers, container valves, connectors, manifold valve assembly, regulators, and relief valves.

(4) Containers and Regulating Equipment Installed Outside of Buildings or Structures. (a) Containers shall not be buried below ground. However, this shall not prohibit the installation in a compartment or recess below grade level, such as a niche in a slope or terrace wall which is used for no other purpose, providing that the container and regulating equipment are not in contact with the ground and the compartment or recess is drained and ventilated horizontally to the outside air from its lowest level, with the outlet at least 3 feet away from any building opening which is below the level of such outlet.

Except as provided in WAC 296-24-47505(10)(m), the discharge from safety relief devices shall be located not less than 3 feet horizontally away from any building opening which is below the level of such discharge and shall not terminate beneath any building unless such

space is well ventilated to the outside and is not enclosed on more than two sides.

(b) Containers shall be set upon firm foundation or otherwise firmly secured; the possible effect on the outlet piping of settling shall be guarded against by a flexible connection or special fitting.

(5) 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 structure is impracticable, containers and equipment are permitted to be used inside of buildings or structures in accordance with (5)(a)(i) through (xii) of this section, and, in addition, such other provisions of this section as are applicable to the particular use or occupancy.

(i) Containers in use shall mean connected for use.

(ii) 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. In either case, an excess flow valve shall be installed in such a manner that any undue strain beyond the excess flow valve will not cause breakage between the container and the excess flow valve. The installation of excess flow valves shall take into account the type of valve protection provided.

(iii) Regulators, if used, 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.

(iv) Valves on containers having a water capacity greater than 50 pounds (nominal 20 pounds LP-Gas capacity) shall be protected while in use.

(v) Containers shall be marked in accordance with WAC 296-24-47505(5)(c) and (2) of this section.

(vi) Pipe or tubing shall conform to WAC 296-24-47505(8) except that aluminum pipe or tubing shall not be used.

(vii) Hose shall be designed for a working pressure of at least 250 p.s.i.g. Hose and hose connections shall have their correctness as to design, construction and performance determined by listing by Underwriters Laboratories, Inc., or Factory Mutual Engineering Corp.

(A) The hose length may exceed the length specified in WAC 296-24-47505(9)(g)(ii), but shall be as short as practicable.

(B) Hose shall be long enough to permit compliance with spacing provisions of this section without kinking or straining or causing hose to be so close to a burner as to be damaged by heat.

(viii) Portable heaters, including salamanders, shall be equipped with an approved automatic device to shut off the flow of gas to the main burner, and pilot if used, in the event of flame extinguishment. Such heaters having inputs above 50,000 B.t.u. manufactured on or after May 17, 1967, and such heaters having inputs above 100,000 B.t.u. manufactured before May 17, 1967, shall be equipped with either:

(A) A pilot which must be lighted and proved before the main burner can be turned on; or

(B) An electric ignition system. The provisions of (5)(viii) of this section do not apply to tar kettle burners, torches, melting pots, nor do they apply to portable heaters under 7,500 B.t.u.h. input when used with containers having a maximum water capacity of 2 1/2 pounds. Container valves, connectors, regulators, manifolds, piping, and tubing shall not be used as structural supports for heaters.

(ix) Containers, regulating equipment, manifolds, pipe, tubing, and hose shall be located so as to minimize exposure to abnormally high temperatures (such as may result from exposure to convection or radiation from heating equipment or installation in confined spaces), physical damage, or tampering by unauthorized persons.

(x) Heat producing equipment shall be located and used so as to minimize the possibility of ignition of combustibles.

(xi) Containers having 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.

(xii) Containers, including the valve protective devices, shall be installed so as to minimize the probability of impingement of discharge of safety relief devices upon containers.

(b) Containers having a maximum water capacity of 2 1/2 pounds (nominal 1 pound LP-Gas capacity) are permitted to be used inside of buildings as part of approved self-contained hand torch assemblies or similar appliances.

(c) Containers having a maximum water capacity of 12 pounds (nominal 5 pounds LP-Gas capacity) are permitted to be used temporarily inside of buildings for public exhibition or demonstration purposes, including use for classroom demonstrations.

(d) When buildings frequented by the public are open to the public, containers are permitted to be used for repair or minor renovation as follows:

(i) The maximum water capacity of individual containers shall be 50 pounds (nominal 20 pounds LP-Gas capacity).

(ii) The number of LP-Gas containers shall not exceed the number of workmen assigned to using the LP-Gas.

(iii) Containers having a water capacity of greater than 2 1/2 pounds (nominal 1 pound LP-Gas capacity) shall not be left unattended in such buildings.

(e) When buildings frequented by the public are not open to the public, containers are permitted to be used for repair or minor renovations, as follows:

The provisions of (5)(f) of this section shall apply except that containers having a water capacity greater than 2 1/2 pounds (nominal 1 pound LP-Gas capacity) shall not be left unattended in such buildings.

(f) Containers are permitted to be used in buildings or structures under construction or undergoing major renovation when such buildings or structures are not occupied by the public, as follows:

(i) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-Gas capacity).

(ii) For temporary heating such as curing concrete, drying plaster and similar applications, 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 container. Blower and radiant type heater shall not be directed toward any LP-Gas container within 20 feet.

(iii) 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.

(iv) 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.

(v) On floors on which heaters are not connected for use, containers are permitted to be manifolded together for connection to a heater or heaters on another floor, Provided:

(A) The total water capacity of containers connected to any one manifold is not greater than 2,450 pounds (nominal 1,000 pounds LP-Gas capacity) and;

(B) Where more than one manifold having a total water capacity greater than 735 pounds (nominal 300 pounds LP-Gas capacity) are located in the same unpartitioned area, they shall be separated by at least 50 feet.

(vi) Storage of containers awaiting use shall be in accordance with WAC 296-24-47513.

(g) Containers are permitted to be used in industrial occupancies for processing, research, or experimental purposes as follows:

(i) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-Gas capacity).

(ii) Containers connected to a manifold shall have a total water capacity not greater than 735 pounds (nominal 300 pounds LP-Gas capacity) and not more than one such manifold may be located in the same room unless separated at least 20 feet from a similar unit.

(iii) The amount of LP-Gas in containers for research and experimental use shall be limited to the smallest practical quantity.

(h) Containers are permitted to be used in industrial occupancies with essentially noncombustible contents where portable equipment for space heating is essential and where a permanent heating installation is not practical, as follows:

(i) Containers and heaters shall comply with and be used in accordance with (5)(f) of this section.

(ii) Containers are permitted to be used in buildings for temporary emergency heating purposes, if necessary to prevent damage to the buildings or contents, when the

permanent heating system is temporarily out of service, as follows:

(i) Containers and heaters shall comply with and be used in accordance with (5)(f) of this section.

(ii) The temporary heating equipment shall not be left unattended.

(j) Containers are permitted to be used temporarily in buildings for training purposes related in installation and use of LP-Gas systems, as follows:

(i) The maximum water capacity of individual containers shall be 245 pounds (nominal 100 pounds LP-Gas capacity), but the maximum quantity of LP-Gas that may be placed in each container shall be 20 pounds.

(ii) If more than one such container is located in the same room, the containers shall be separated by at least 20 feet.

(iii) Containers shall be removed from the building when the training class has terminated.

(6) Container Valves and Accessories. (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.

NOTE: This provision is not to be construed as requiring an automatic changeover device

(b) 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 that the elements (sleet, snow, or ice) will not affect their operation.

(c) Valves and connections to the containers shall be protected while in transit, in storage, and while being moved into final utilization, as follows:

(i) By setting into the recess of the container to prevent the possibility of their being struck if the container is dropped upon a flat surface, or

(ii) 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 4 feet. Construction must be such that a blow will not be transmitted to the valve or other connection.

(d) When containers are not connected to the system, the outlet valves shall be kept tightly closed or plugged, even though containers are considered empty.

(e) Containers having a water capacity in excess of 50 pounds (approximately 21 pounds LP-Gas capacity), recharged at the installation, shall be provided with excess flow or backflow check valves to prevent the discharge of container contents in case of failure of the filling or equalizing connection.

(7) Safety Devices. (a) Containers shall be provided with safety devices as required by DOT regulations.

(b) A final stage regulator of an LP-Gas system (excluding any appliance regulator) shall be equipped on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30.

TABLE H-30

Regulator delivery pressure	Relief valve start to discharge pressure setting (percent of regulator deliver pressure)	
	Minimum	Maximum
1 p.s.i.g. or less	200	300
Above 1 p.s.i.g. but not over 3 p.s.i.g.	140	200
Above 3 p.s.i.g.	125	200

(c) When a regulator or pressure relief valve is used inside a building for other than purposes specified in WAC 296-24-47505(6)(a)(i) through (vi), the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any building opening which is below such discharge. These provisions do not apply to individual appliance regulators when protection is otherwise provided nor to (5) of this section and WAC 296-24-47505(10)(m). In buildings devoted exclusively to gas distribution purposes, the space above the diaphragm need not be vented to the outside.

(8) Reinstallation of Containers. Containers shall not be reinstalled unless they are requalified in accordance with DOT regulations.

(a) Permissible Product. A product shall not be placed in a container marked with a service pressure less than four-fifths of the maximum vapor pressure of product at 130°F. [Order 73-5, § 296-24-47507, filed 5/9/73 and Order 73-4, § 296-24-47507, filed 5/7/73.]

WAC 296-24-47509 Systems utilizing containers other than DOT containers. (1) Application. This section applies specifically to systems utilizing storage containers other than those constructed in accordance with DOT specifications. Wac 296-24-47505 of this section applies to this section unless otherwise noted in WAC 296-24-47505.

(2) Design Pressure and Classification of Storage Containers. Storage containers shall be designed and classified in accordance with Table H-31.

(3) Container Valves and Accessories, Filler Pipes, and Discharge Pipes. (a) The filling pipe inlet terminal shall not be located inside a building. For containers with a water capacity of 125 gallons or more, such terminals shall be located not less than 10 feet from any building (see WAC 296-24-47505(6)(b)), and preferably not less than 5 feet from any driveway, and shall be located in a protective housing built for the purpose.

TABLE H-31

Container type	For gases with vapor press. Not to exceed lb. per sq. in. gage at 100°F. (37.8°C.)	Minimum design pressures of container lb. per sq. in. gage	
		1949 and earlier editions of ASME Code (Par. U-68 U-69)	1949 edition of Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ³
80 ¹	80 ¹	80 ¹	100 ¹
100	100	100	125
125	125	125	156
150	150	150	187
175	175	175	219
200 ²	215	200	250

¹New storage containers of the 80 type have not been authorized since Dec. 31, 1947.

²Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designations when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under: (1) the 1949 ASME Code (Par. U-200 and U-201), (2) 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and (3) all editions of the API-ASME Code.

³Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

(b) The filling connection shall be fitted with one of the following:

(i) Combination back-pressure check valve and excess flow valve.

(ii) One double or two single back-pressure check valves.

(iii) A positive shutoff valve in conjunction with either:

(A) An internal back pressure valve, or

(B) An internal excess flow valve.

(c) All openings in a container shall be equipped with approved automatic excess flow valves except in the following: filling connections as provided in (3)(b) of this section; safety relief connections, liquid-level gaging devices as provided in WAC 296-24-47505(7)(d), (19)(c) and (19)(h); pressure gage connections as provided in WAC 296-24-47505(7)(e), as provided in (3)(d), (f) and (g) of this section.

(d) An excess flow valve is not required in the withdrawal service line providing the following are complied with:

(i) Such systems' total water capacity does not exceed 2,000 U.S. gallons.

(ii) The discharge from the service outlet is controlled by a suitable manually operated shutoff valve which is:

(A) Threaded directly into the service outlet of the container; or

(B) Is an integral part of a substantial fitting threaded into or on the service outlet of the container; or

(C) Threaded directly into a substantial fitting threaded into or on the service outlet of the container.

(iii) The shutoff valve is equipped with an attached handwheel or the equivalent.

(iv) The controlling orifice between the contents of the container and the outlet of the shutoff valve does not exceed five-sixteenths inch in diameter for vapor withdrawal systems and one-eighth inch in diameter for liquid withdrawal systems.

(v) An approved pressure-reducing regulator is directly attached to the outlet of the shutoff valve and is rigidly supported, or that an approved pressure-reducing regulator is attached to the outlet of the shutoff valve by means of a suitable flexible connection, provided the regulator is adequately supported and properly protected on or at the tank.

(e) All inlet and outlet connections except safety relief valves, liquid level gaging devices and pressure gages on containers of 2,000 gallons water capacity, or more, and on any container used to supply fuel directly to an internal combustion engine, shall be labeled to designate whether they communicate with vapor or liquid space. Labels may be on valves.

(f) In lieu of an excess flow valve openings may be fitted with a quick-closing internal valve which, except during operating periods shall remain closed. The internal mechanism for such valves may be provided with a secondary control which shall be equipped with a fusible plug (not over 220°F. melting point) which will cause the internal valve to close automatically in case of fire.

(g) Not more than two plugged openings shall be permitted on a container of 2,000 gallons or less water capacity.

(h) Containers of 125 gallons water capacity or more manufactured after July 1, 1961, shall be provided with an approved device for liquid evacuation, the size of which shall be three-fourths inch national pipe thread minimum. A plugged opening will not satisfy this requirements.

(4) Safety Devices. (a) All safety devices shall comply with the following:

(i) All container safety relief devices shall be located on the containers and shall have direct communication with the vapor space of the container.

(ii) In industrial and gas manufacturing plants, discharge pipe from safety relief valves on pipe lines within a building shall discharge vertically upward and shall be piped to a point outside a building.

(iii) Safety relief device discharge terminals shall be so located as to provide protection against physical damage and such discharge pipes shall be fitted with loose raincaps. Return bends and restrictive pipefittings shall not be permitted.

(iv) If desired, discharge lines from two or more safety relief devices located on the same unit, or similar lines from two or more different units, may be run into a common discharge header, provided that the cross-sectional area of such header be at least equal to the sum of the cross-sectional area of the individual discharge lines, and that the setting of safety relief valves are the same.

(v) Each storage container of over 2,000 gallons water capacity shall be provided with a suitable pressure gage.

(vi) A final stage regulator of an LP-Gas system (excluding any appliance regulator) shall be equipped on

the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30.

(vii) When a regulator or pressure relief valve is installed inside a building, the relief valve and the space above the regulator and relief valve diaphragms shall be vented to the outside air with the discharge outlet located not less than 3 feet horizontally away from any opening into the building which is below such discharge. (These provisions do not apply to individual appliance regulators when protection is otherwise provided. In buildings devoted exclusively to gas distribution purposes, the space above the diaphragm need not be vented to the outside.)

(b) Safety devices for aboveground containers shall be provided as follows:

(i) Containers of 1,200 gallons water capacity or less which may contain liquid fuel when installed above ground shall have the rate of discharge required by WAC 296-24-47505(10)(b) provided by a spring-loaded relief valve or valves. In addition to the required spring-loaded relief valve(s) suitable fuse plug(s) may be used provided the total discharge area of the fuse plug(s) for each container does not exceed 0.25 square inch.

(ii) The fusible metal of the fuse plugs shall have a yield temperature of 208°F. minimum and 220°F. maximum. Relief valves and fuse plugs shall have direct communication with the vapor space of the container.

(iii) On a container having a water capacity greater than 125 gallons, but not over 2,000 gallons, the discharge from the safety relief valves shall be vented away from the container vertically upwards and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision shall be made for draining condensate which may accumulate in the relief valve or its discharge pipe.

(iv) On containers of 125 gallons water capacity or less, the discharge from safety relief devices shall be located not less than 5 feet horizontally away from any opening into the building below the level of such discharge.

(v) On a container having a water capacity greater than 2,000 gallons, the discharge from the safety relief valves shall be vented away from the container vertically upwards to a point at least 7 feet above the container, and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. Suitable provision shall be made so that any liquid or condensate that may accumulate inside of the safety relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, a means shall be provided to protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of product escaping from the drain.

(c) On all containers which are installed underground and which contain no liquid fuel until buried and covered, the rate of discharge of the spring-loaded relief valve installed thereon may be reduced to a minimum of 30 percent of the rate of discharge specified in WAC

296-24-47505(10)(b), Containers so protected shall not be uncovered after installation until the liquid fuel has been removed therefrom. Containers which may contain liquid fuel before being installed under ground and before being completely covered with earth are to be considered aboveground containers when determining the rate of discharge requirement of the relief valves.

(d) On underground containers of more than 2,000 gallons water capacity, the discharge from safety relief devices shall be piped vertically and directly upward to a point at least 7 feet above the ground.

Where there is a probability of the manhole or housing becoming flooded, the discharge from regulator vent lines shall be above the highest probable water level. All manholes or housings shall be provided with ventilated louvers or their equivalent, the area of such openings equaling or exceeding the combined discharge areas of the safety relief valves and other vent lines which discharge their content into the manhole housing.

(e) Safety devices for vaporizers shall be provided as follows:

(i) Vaporizers of less than 1 quart total capacity, heated by the ground or the surrounding air, need not be equipped with safety relief valves provided that adequate tests certified by any of the authorities referred to in WAC 296-24-47505(2), demonstrate that the assembly is safe without safety relief valves.

(ii) No vaporizer shall be equipped with fusible plugs.

(iii) In industrial and gas manufacturing plants, safety relief valves on vaporizers within a building shall be piped to a point outside the building and be discharged upward.

(5) Reinstallation of Containers. Containers may be reinstalled if they do not show any evidence of harmful external corrosion or other damage. Where containers are reinstalled underground, the corrosion resistant coating shall be put in good condition (see (7)(f) of this section.) Where containers are reinstalled above ground, the safety devices and gaging devices shall comply with (4) of this section and WAC 296-24-47505(19) respectively for aboveground containers.

(6) Capacity of Containers. A storage container shall not exceed 90,000 gallons water capacity.

(7) Installation of storage containers. (a) Containers installed above ground, except as provided in (7)(g) of this section, shall be provided with substantial masonry or noncombustible structural supports on firm masonry foundation.

(b) Aboveground containers shall be supported as follows:

(i) Horizontal containers shall be mounted on saddles in such a manner as to permit expansion and contraction. Structural metal supports may be employed when they are protected against fire in an approved manner. Suitable means of preventing corrosion shall be provided on that portion of the container in contact with the foundations or saddles.

(ii) Containers of 2,000 gallons water capacity or less may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container shell

to the concrete pad, footing, or the ground does not exceed 24 inches.

(c) Any container may be installed with nonfireproofed ferrous metal supports if mounted on concrete pads or footings, and if the distance from the outside bottom of the container to the ground does not exceed 5 feet, provided the container is in an isolated location.

(d) Containers may be partially buried providing the following requirements are met:

(i) The portion of the container below the surface and for a vertical distance not less than 3 inches above the surface of the ground is protected to resist corrosion, and the container is protected against settling and corrosion as required for fully buried containers.

(ii) Spacing requirements shall be as specified for underground tanks in WAC 296-24-47505(6)(b).

(iii) Relief valve capacity shall be as required for aboveground containers.

(iv) Container is located so as not to be subject to vehicular damage, or is adequately protected against such damage.

(v) Filling densities shall be as required for aboveground containers as specified in Table H-27. See WAC 296-24-47505.

(e) Containers buried underground shall be placed so that the top of the container is not less than 6 inches below grade. Where an underground container might be subject to abrasive action or physical damage due to vehicular traffic or other causes, then it shall be:

(i) Placed not less than 2 feet below grade, or

(ii) Otherwise protected against such physical damage.

It will not be necessary to cover the portion of the container to which manhole and other connections are affixed; however, where necessary, protection shall be provided against vehicular damage. When necessary to prevent floating, containers shall be securely anchored or weighted.

(f) Containers shall be given a protective coating before being placed underground. This coating shall be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, care shall be exercised to prevent damage to the coating. Any damage to the coating shall be repaired before backfilling.

(i) Containers shall be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(g) Containers with foundations attached (portable or semiportable containers with suitable steel "runners" or "skids" and popularly known in the industry as "skid tanks") shall be designed, installed, and used in accordance with these rules subject to the following provisions:

(i) If they are to be used at a given general location for a temporary period not to exceed 6 months they need not have fire-resisting foundations or saddles but shall have adequate ferrous metal supports.

(ii) They shall not be located with the outside bottom of the container shell more than 5 feet above the surface of the ground unless fire-resisting supports are provided.

(iii) The bottom of the skids shall not be less than 2 inches or more than 12 inches below the outside bottom of the container shell.

(iv) Flanges, nozzels, valves, fittings, and the like, having communication with the interior of the container, shall be protected against physical damage.

(v) When not permanently located on fire-resisting foundations, piping connections shall be sufficiently flexible to minimize the possibility of breakage or leakage of connections if the container settles, moves, or is otherwise displaced.

(vi) Skids, or lugs for attachment of skids, shall be secured to the container in accordance with the code or rules under which the container is designed and built (with a minimum factor of safety of four) to withstand loading in any direction equal to four times the weight of the container and attachments when filled to the maximum permissible loaded weight.

(h) Field welding where necessary shall be made only on saddle plates or brackets which were applied by the manufacturer of the tank.

(i) For aboveground containers, secure anchorage or adequate pier height shall be provided against possible container flotation wherever sufficiently high floodwater might occur.

(j) When permanently installed containers are interconnected, provision shall be made to compensate for expansion, contraction, vibration, and settling of containers, and interconnecting piping. Where flexible connections are used, they shall be of an approved type and shall be designed for a bursting pressure of not less than five times the vapor pressure of the product at 100°F. The use of nonmetallic hose is prohibited for permanently interconnecting such containers.

(k) Container assemblies listed for interchangeable installation above ground or under ground shall conform to the requirements for aboveground installations with respect to safety relief capacity and filling density. For installation above ground all other requirements for aboveground installations shall apply. For installation under ground all other requirements for underground installations shall apply.

(8) Protection of Container Accessories. (a) Valves, regulating, gaging, and other container accessory equipment shall be protected against tampering and physical damage. Such accessories shall also be so protected during the transit of containers intended for installation underground.

(b) On underground or combination aboveground-underground containers, the service valve handwheel, the terminal for connecting the hose, and the opening through which there can be a flow from safety relief valves shall be at least 4 inches above the container and this opening shall be located in the dome or housing. Underground systems shall be so installed that all the above openings, including the regulator vent, are located above the normal maximum water table.

(c) All connections to the underground containers shall be located within a substantial dome, housing, or manhole and with access thereto protected by a substantial cover.

(9) Drips for Condensed Gas. Where vaporized gas on the low-pressure side of the system may condense to a liquid at normal operating temperatures and pressures, suitable means shall be provided for revaporization of the condensate.

(10) Damage From Vehicles. When damage to LP-Gas systems from vehicular traffic is a possibility, precautions against such damage shall be taken.

(11) Pits and Drains. Every effort should be made to avoid the use of pits, except pits fitted with automatic flammable vapor detecting devices. No drains or blowoff lines shall be directed into or in proximity to sewer systems used for other purposes.

(12) General Provisions Applicable to Systems in Industrial Plants (of 2,000 Gallons Water Capacity and More) and to Bulk Filling Plants. (a) When standard watch service is provided, it shall be extended to the LP-Gas installation and personnel properly trained.

(b) If loading and unloading are normally done during other than daylight hours, adequate lights shall be provided to illuminate storage containers, control valves, and other equipment.

(c) Suitable roadways or means of access for extinguishing equipment such as wheeled extinguishers or fire department apparatus shall be provided.

(d) To minimize trespassing or tampering, the area which includes container appurtenances, pumping equipment, loading and unloading facilities, and cylinder-filling facilities shall be enclosed with at least a 6-foot-high industrial type fence unless otherwise adequately protected. There shall be at least two means of emergency access.

(13) Container-Charging Plants. (a) The container-charging room shall be located not less than:

(i) Ten feet from bulk storage containers.

(ii) Twenty-five feet from line of adjoining property which may be built upon.

(b) Tank truck filling station outlets shall be located not less than:

(i) Twenty-five feet from line of adjoining property which may be built upon.

(ii) Ten feet from pumps and compressors if housed in one or more separate buildings.

(c) The pumps or compressors may be located in the container-charging room or building, in a separate building, or outside of buildings. When housed in separate building, such building (a small noncombustible weather cover is not to be construed as a building) shall be located not less than:

(i) Ten feet from bulk storage tanks.

(ii) Twenty-five feet from line of adjoining property which may be built upon.

(iii) Twenty-five feet from sources of ignition.

(d) When a part of the container-charging building is to be used for a boiler room or where open flames or similar sources of ignition exist or are employed, the space to be so occupied shall be separated from container charging room by a partition wall or walls of fire-resistant construction continuous from floor to roof or ceiling. Such separation walls shall be without openings and shall be joined to the floor, other walls, and ceiling

or roof in a manner to effect a permanent gas-tight joint.

(e) Electrical equipment and installations shall conform with WAC 296-24-47505 (17) and (18).

(14) Fire Protection. (a) Each bulk plant shall be provided with at least one approved portable fire extinguisher having a minimum rating of 12-B, C.

(b) In industrial installations involving containers of 150,000 gallons aggregate water capacity or more, provision shall be made for an adequate supply of water at the container site for fire protection in the container area, unless other adequate means for fire control are provided. Water hydrants shall be readily accessible and so spaced as to provide water protection for all containers. Sufficient lengths of firehose shall be provided at each hydrant location on a hose cart, or other means provided to facilitate easy movement of the hose in the container area. It is desirable to equip the outlet of each hose line with a combination fog nozzle. A shelter shall be provided to protect the hose and its conveyor from the weather.

(15) Painting. Aboveground containers shall be kept properly painted.

(16) Lighting. Electrical equipment and installations shall conform to WAC 296-24-47505(17) and (18).

(17) Vaporizers for Internal Combustion Engines. The provisions of WAC 296-24-47511(8) shall apply.

(18) Gas Regulating and Mixing Equipment for Internal Combustion Engines. The provisions of WAC 296-24-47511(9) shall apply. [Order 73-5, § 296-24-47509, filed 5/9/73 and Order 73-4, § 296-24-47509, filed 5/7/73.]

WAC 296-24-47511 Liquefied petroleum gas as a motor fuel. (1) Application. (a) This section applies to internal combustion engines, fuel containers, and pertinent equipment for the use of liquefied petroleum gases as a motor fuel on easily movable, readily portable units including self-propelled vehicles.

(b) Fuel containers and pertinent equipment for internal combustion engines using liquefied petroleum gas where installation is of the stationary type are covered by WAC 296-24-47509. This section does not apply to containers for transportation of liquefied petroleum gases nor to marine fuel use. All requirements of WAC 296-24-47505 apply to this section, unless otherwise noted in WAC 296-24-47505.

(2) General. (a) Fuel may be used from the cargo tank of a truck while in transit, but not from cargo tanks on trailers or semitrailers. The use of fuel from the cargo tanks to operate stationary engines is permitted providing wheels are securely blocked.

(b) Passenger-carrying vehicles shall not be fueled while passengers are on board.

(c) Industrial trucks (including lift trucks) equipped with permanently mounted fuel containers shall be charged outdoors. Charging equipment shall comply with the provisions of WAC 296-24-47517.

(d) LP-Gas fueled industrial trucks shall comply with the Standard for Type Designations, Areas of Use, Maintenance and Operation of Powered Industrial Trucks, NFPA 505-1969.

(e) Engines on vehicles shall be shut down while fueling if the fueling operation involves venting to the atmosphere.

(3) Design Pressure and Classification of Fuel Containers. (a) Except as covered in (3)(b) and (c) of this section, containers shall be in accordance with Table H-32.

(b) Fuel containers for use in industrial trucks (including lift trucks) shall be either DOT containers authorized for LP-Gas service having a minimum service pressure of 240 p.s.i.g or minimum Container Type 250. Under 1950 and later ASME codes, this means a 312.5-p.s.i.g design pressure container.

TABLE H-32

Container type	For gases with vapor press. Not to exceed lb. per sq. in. gage at 100°F. (37.8 C.)	Minimum design pressure of container lb. per sq. in. gage	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ²
200 ¹	215	200	250

¹Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of the ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under: (1) the 1949 ASME Code (Par. U-200 and U-201) (2) 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and (3) all editions of the API-ASME code.

²Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

(c) Containers manufactured and maintained under DOT specifications and regulations may be used as fuel containers. When so used they shall conform to all requirements of this section.

(d) All container inlets and outlets except safety relief valves and gaging devices shall be labeled to designate whether they communicate with vapor or liquid space. (Labels may be on valves.)

(4) Installation of Fuel Containers. (a) Containers shall be located in a place and in a manner to minimize the possibility of damage to the container. Containers located in the rear of trucks and buses, when protected by substantial bumpers, will be considered in conformance with this requirement. Fuel containers on passenger-carrying vehicles shall be installed as far from the engine as is practicable, and the passenger space and any space containing radio equipment shall be sealed from the container space to prevent direct seepage of gas to these spaces. The container compartment shall be vented to the outside. In case the fuel container is mounted near the engine or the exhaust system, the container shall be shielded against direct heat radiation.

(b) Containers shall be installed with as much clearance as practicable but never less than the minimum road clearance of the vehicle under maximum spring deflection. This minimum clearance shall be to the bottom of the container or to the lowest fitting on the container or housing, whichever is lower.

(c) 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. Field welding, when necessary, shall be made only on saddle plates, lugs or brackets, originally attached to the container by the tank manufacturer.

(d) Fuel containers on buses shall be permanently installed.

(e) Containers from which vapor only is to be withdrawn shall be installed and equipped with suitable connections to minimize the accidental withdrawal of liquid.

(5) Valves and Accessories. (a) Container valves and accessories shall have a rated working pressure of at least 250 p.s.i.g., and shall be of a type suitable for liquefied petroleum gas service.

(b) The filling connection shall be fitted with an approved double back-pressure check valve, or a positive shutoff in conjunction with an internal back-pressure check valve. On a removable container the filler valve may be a hand operated shutoff valve with an internal excess flow valve. Main shutoff valves on the container on liquid and vapor must be readily accessible.

(c) With the exceptions of (5)(d)(iii) of this Section, filling connections equipped with approved automatic back-pressure check valves, and safety relief valves, all connections to the containers having openings for the flow of gas in excess of a No. 54 drill size shall be equipped with approved automatic excess flow valves to prevent discharge of content in case connections are broken.

(d) Liquid-level gaging devices:

(i) Variable liquid-level gages which require the venting of fuel to the atmosphere shall not be used on fuel containers of industrial trucks (including lift trucks).

(ii) On portable containers that may be filled in the vertical and/or horizontal position, the fixed liquid-level gage shall indicate maximum permitted filling level for both vertical and horizontal filling with the container oriented to place the safety relief valve in communication with the vapor space.

(iii) In the case of containers used solely in farm tractor service and charged at a point at least 50 feet from any important building, the fixed liquid-level gaging device may be so constructed that the outward flow of container content exceeds that passed by a No. 54 drill size opening, but in no case shall the flow exceed that passed by a No. 31 drill-size opening. An excess flow valve is not required. Fittings equipped with such restricted drill size opening and container on which they are used shall be marked to indicate the size of the opening.

(iv) All valves and connections on containers shall be adequately protected to prevent damage due to accidental contact with stationary objects or from loose objects thrown up from the road, and all valves shall be safeguarded against damage due to collision, overturning or other accident. For farm tractors where parts of the vehicle provide such protection to valves and fittings, the foregoing requirements shall be considered fulfilled. However, on removable type containers the protection for the fittings shall be permanently attached to the container.

(v) (Exchange of removable fuel containers preferable should be done outdoors but may be done indoors). When removable fuel containers are used, means shall be provided in the fuel system to minimize the escape of fuel when the containers are exchanged. This shall be accomplished by one of the following methods:

(A) Using an approved automatic quick-closing coupling (a type closing in both directions when uncoupled) in the fuel line, or

(B) Closing the valve at the fuel container and allowing the engine to run until the fuel in the line is consumed.

(6) Piping—Including Pipe, Tubing, and Fittings. (a) Pipe from fuel container to first-stage regulator shall be not less than schedule 80 wrought iron or steel (black or galvanized), brass or copper; or seamless copper, brass, or steel tubing. Steel tubing shall have a minimum wall thickness of 0.049 inch. Steel pipe or tubing shall be adequately protected against exterior corrosion. Copper tubing shall be types K or L or equivalent having a minimum wall thickness of 0.032 inch. Approved flexible connections may be used between container and regulator or between regulator and gas-air mixer within the limits of approval. The use of aluminum pipe or tubing is prohibited. In the case of removable containers an approved flexible connection shall be used between the container and the fuel line.

(b) All piping shall be installed, braced, and supported so as to reduce to a minimum the possibility of vibration strains or wear.

(7) Safety Devices. (a) Spring-loaded internal type safety relief valves shall be used on all motor fuel containers.

(b) The discharge outlet from safety relief valves shall be located on the outside of enclosed spaces and as far as practicable from possible sources of ignition, and vented upward within 45 degrees of the vertical in such a manner as to prevent impingement of escaping gas upon containers, or parts of vehicles, or on vehicles in adjacent lines of traffic. A rain cap or other protector shall be used to keep water and dirt from collecting in the valve.

(c) When a discharge line from the container safety relief valve is used, the line shall be metallic, other than aluminum, and shall be sized, located, and maintained so as not to restrict the required flow of gas from the safety relief valve. Such discharge line shall be able to withstand the pressure resulting from the discharge of vapor when the safety relief valve is in the full open position. When flexibility is necessary, flexible metal hose or tubing shall be used.

(d) Portable containers equipped for volumetric filling may be filled in either the vertical or horizontal position only when oriented to place the safety relief valve in communication with the vapor space.

(e) WAC 296-24-47505(10)(1) for hydrostatic relief valves shall apply.

(8) Vaporizers. (a) Vaporizers and any part thereof and other devices that may be subjected to container pressure shall have a design pressure of at least 250 p.s.i.g.

(b) Each vaporizer shall have a valve or suitable plug which will permit substantially complete draining of the vaporizer. It shall be located at or near the lowest portion of the section occupied by the water or other heating medium.

(c) Vaporizers shall be securely fastened so as to minimize the possibility of becoming loosened.

(d) Each vaporizer shall be permanently marked at a visible point as follows:

(i) With the design pressure of the fuel-containing portion in p.s.i.g.

(ii) With the water capacity of the fuel-containing portion of the vaporizer in pounds.

(e) Devices to supply heat directly to a fuel container shall be equipped with an automatic device to cut off the supply of heat before the pressure inside the fuel container reaches 80 percent of the start to discharge pressure setting of the safety relief device on the fuel container.

(f) Engine exhaust gases may be used as a direct source of heat supply for the vaporization of fuel if the materials of construction of those parts of the vaporizer in contact with exhaust gases are resistant to the corrosive action of exhaust gases and the vaporizer system is designed to prevent excessive pressures.

(g) Vaporizers shall not be equipped with fusible plugs.

(9) Gas Regulating and Mixing Equipment. (a) Approved automatic pressure reducing equipment shall be installed in a secure manner between the fuel supply container and gas-air mixer for the purpose of reducing the pressure of the fuel delivered to the gas-air mixer.

(b) An approved automatic shutoff valve shall be provided in the fuel system at some point ahead of the inlet of the gas-air mixer, designed to prevent flow of fuel to the mixer when the ignition is off and the engine is not running. In the case of industrial trucks and engines operating in buildings other than those used exclusively to house engines, the automatic shutoff valve shall be designed to operate if the engine should stop. Atmospheric type regulators (zero governors) shall be considered adequate as an automatic shutoff valve only in cases of outdoor operation such as farm tractors, construction equipment, irrigation pump engines, and other outdoor stationary engine installations.

(c) The source of the air for combustion shall be completely isolated from the passenger compartment, ventilating system, or air-conditioning system.

(10) Capacity of Containers. No single fuel container used on passenger carrying vehicles shall exceed 200 gallons water capacity. No single fuel container on other vehicles normally operating on the highway shall exceed

300 gallons water capacity except as provided in (2)(a) of this section.

(11) Stationary Engines in Buildings. Stationary engines and gas turbines installed in buildings, including portable engines used instead of or to supplement stationary engines, shall comply with the Standard for the Institution and Use of Stationary Combustion Engines and Gas Turbines, NFPA 37-1970, and the appropriate provisions of WAC 296-24-47505 through WAC 296-24-47509.

(12) Portable Engines in Buildings. (a) Portable engines may be used in buildings only for emergency use, except as provided by (11) of this section.

(b) Exhaust gases shall be discharged to outside the building or to an area where they will not constitute a hazard.

(c) Provision shall be made to supply sufficient air for combustion and cooling.

(d) An approved automatic shutoff valve shall be provided in the fuel system ahead of the engine, designed to prevent flow of fuel to the engine when the ignition is off or if the engine should stop.

(e) The capacity of LP-Gas containers used with such engines shall comply with the applicable occupancy provision of WAC 296-24-47507(5).

(13) Industrial Trucks Inside Buildings. (a) LP-Gas-fueled industrial trucks are permitted to be used in buildings and structures.

(b) No more than two LP-Gas containers shall be used on an industrial truck for motor fuel purposes.

(c) LP-Gas-fueled industrial trucks are permitted to be used in buildings frequented by the public, when occupied by the public. The total water capacity of containers on each industrial truck shall not exceed 105 pounds (nominal 45 pounds LP-Gas).

(d) Trucks shall not be left unattended in areas occupied by the public.

(e) Industrial trucks shall not be parked and left unattended in areas of possible excessive heat or sources of ignition.

(14) Garaging LP-Gas-Fueled Vehicles. (a) LP-Gas-fueled vehicles may be stored or serviced inside garages provided there are no leaks in the fuel system and the fuel tanks are not filled beyond the maximum filling capacity specified in WAC 296-24-47505(12)(a).

(b) LP-Gas-fueled vehicles being repaired in garages shall have the container shutoff valve closed except when fuel is required for engine operation.

(c) Such vehicles shall not be parked near sources of heat, open flames, or similar sources of ignition or near open pits unless such pits are adequately ventilated. [Order 73-5, § 296-24-47511, filed 5/9/73 and Order 73-4, § 296-24-47511, filed 5/7/73.]

WAC 296-24-47513 Storage of containers awaiting use or resale. (1) Application. This paragraph shall apply to the storage of portable containers not in excess of 1,000 pounds water capacity, filled or partially filled, at user location but not connected for use, or in storage for resale by dealers or resellers. This section shall not apply

to containers stored at charging plants or at plants devoted primarily to the storage and distribution of LP-Gas or other petroleum products.

(2) General. (a) Containers in storage shall be located so as to minimize exposure to excessive temperature rise, physical damage, or tampering by unauthorized persons.

(b) Containers when stored inside shall not be located near exits, stairways, or in areas normally used or intended for the safe exit of people.

(c) Container valves shall be protected while in storage as follows:

(i) By setting into recess of container to prevent the possibility of their being struck if the container is dropped upon a flat surface, or

(ii) By ventilated cap or collar, fastened to container capable of withstanding blow from any direction equivalent to that of a 30-pound weight dropped 4 feet. Construction must be such that a blow will not be transmitted to a valve or other connection.

(d) The outlet valves of containers in storage shall be closed.

(e) Empty containers which have been in LP-Gas service should preferably be stored in the open. When stored inside, they shall be considered as full containers for the purpose of determining the maximum quantity of LP-Gas permitted by this section.

(3) Storage Within Buildings Frequented by the Public. (a) DOT specification containers having a maximum individual water capacity of 2 1/2 pounds, used with completely self-contained hand torches and similar applications, are permitted to be stored or displayed in a building frequented by the public. The display of such containers shall be limited to a total of 24 units of each brand and size. The total quantity on display and in storage shall not exceed 200 pounds LP-Gas.

(b) Storage as provided in (5) of this section shall not be permitted within or attached to such a building.

(4) Storage Within Buildings Not Frequented by the Public (Such as Industrial Buildings). (a) The quantity of LP-Gas stored shall not exceed 300 pounds (approximately 2,550 cubic feet in vapor form) except as provided in (5) of this section.

(b) Containers carried as a part of service equipment on highway mobile vehicles are not to be considered in the total storage capacity in (4)(a) of this section provided such vehicles are stored in private garages, and are limited to one container per vehicle with an LP-Gas capacity of not more than 100 pounds. All container valves shall be closed.

(5) Storage Within Special Buildings or Rooms. (a) The quantity of LP-Gas stored in special buildings or rooms shall not exceed 10,000 pounds.

(b) The walls, floors, and ceilings of container storage rooms that are within or adjacent to other parts of the building shall be constructed of material having at least a 2-hour fire resistance rating.

(c) A portion of the exterior walls or roof having an area not less than 10 percent of that of the combined area of the enclosing walls and roof shall be of explosion relieving construction.

(d) Each opening from such storage rooms to other parts of the building shall be protected by a 1 1/2 hour (B) fire door listed by Underwriters Laboratories Inc.

(e) Such rooms shall have no open flames for heating or lighting.

(f) Such rooms shall be adequately ventilated both top and bottom to the outside only. The openings from such vents shall be at least 5 feet away from any other opening into any building.

(g) The floors of such rooms shall not be below ground level. Any space below the floor shall be of solid fill or properly ventilated to the open air.

(h) Such storage rooms shall not be located adjoining the line of property occupied by schools, churches, hospitals, athletic fields or other points of public gathering.

(i) Fixed electrical equipment shall be installed in accordance with WAC 296-24-47505(18).

(6) Storage Outside of Buildings. (a) Storage outside of buildings, for containers awaiting use or resale, shall be located in accordance with Table H-33 with respect to; (i) the nearest important building or group of buildings; (ii) the line of adjoining property which may be built upon; (iii) busy thoroughfares; (vi) the line of adjoining property occupied by schools, churches, hospitals, athletic fields, or other points of public gathering.

TABLE H-33

Quantity of LP-Gas Stored:	Distance
500 pounds or less _____	0
501 to 2,500 pounds _____	0*
2,501 to 6,000 pounds _____	10 feet
6,001 to 10,000 pounds _____	20 feet
Over 10,000 pounds _____	25 feet

*Container or containers shall be at least 10 feet from any building on adjoining property, any sidewalk, or any of the exposures described in (6)(a)(iii) or (iv) of this section.

(b) Containers shall be in a suitable enclosure or otherwise protected against tampering.

(7) Fire Protection. Storage locations other than supply depots separated and located apart from dealer, reseller, or user establishments shall be provided with at least one approved portable fire extinguisher having a minimum rating of 8-B, C. [Order 76-6, § 296-24-47513, filed 3/1/76; Order 73-5, § 296-24-47513, filed 5/9/73 and Order 73-4, § 296-24-47513, filed 5/7/73.]

WAC 296-24-47515 LP-Gas system installations on commercial vehicles. (1) Application. This paragraph applies to LP-Gas-system installations on vehicles (whether self-propelled or of the trailer or semitrailer type) used for commercial, construction, or public service purposes such as mobile libraries and clinics; to all exchangeable container systems with container capacities greater than 105 pounds water capacity (approximately 45 pounds LP-Gas capacity) and to systems using containers permanently mounted on vehicles. It

does not apply to LP-Gas motor fuel systems covered by WAC 296-24-47511. WAC 296-24-47505 applies to this section unless otherwise noted. When such a vehicle is permanently parked, and LP-Gas is supplied from a system not mounted on and secured to the unit, WAC 296-24-47507 and WAC 296-24-47509 shall apply.

(2) Construction and Marking of Containers. Containers shall be constructed in accordance with WAC 296-24-47505(3), and marked in accordance with the applicable requirements of WAC 296-24-47505(5), and shall also meet the following:

(a) Containers designed for use as portable cylinders shall be constructed in accordance with DOT specifications, and in accordance with WAC 296-24-47505(2)(e); where applicable.

(b) All other containers whether designed for permanent mounting, or for portable or semiportable use (such as skid tanks), shall be constructed as provided for by WAC 296-24-47505(2)(d) and (3)(a). Mounting, securing, and protection of such containers shall be as in (2)(c) and (d) of this section.

(c) Permanently installed containers shall meet the requirements of (2)(c)(i) and (ii) of this section with regard to container valves and accessories, and (2)(c)(iii) through (vi) of this section as to mounting.

(i) Nonrecessed container fittings and appurtenances shall be protected against damage by either:

(A) Their location.

(B) The vehicle frame or bumper, or

(C) protective housing. The protective housing, if used, shall comply with the requirements under which the tanks are fabricated with respect to design and construction and shall be designed to withstand static loadings in any direction equal to twice the weight of the tank and attachments when filled with the lading using a safety factor of not less than four, based on the ultimate strength of the material to be used. The housing shall be provided with a weather cover if necessary to insure proper operation of valves and safety devices.

(ii) Manually operated shutoff valves, except as covered in WAC 296-24-47511(2)(a), or self-closing internal valves shall be closed except during transfer operations.

(iii) Tank motor vehicles with frames not made integral with the tank, as by welding, shall be provided with turnbuckles or similar positive devices for drawing the tank down tight on the frame. In addition, suitable stops or anchors shall be attached to the frame and/or the tank to prevent relative motion between them due to starting, stopping, and turning. The stops and anchors shall be so installed as to be readily accessible for inspection and maintenance.

(iv) Any tank motor vehicle designed and constructed so that the cargo tank constitutes in whole or in part the stress member used in lieu of a frame shall be supported by external cradles subtending at least 120 degrees of the shell circumference. The design calculations shall include beam stress, shear stress, torsion stress, bending moment, and acceleration stress for the cargo tank as a whole using a factor of safety of four, based on the ultimate tensile strength of the material. Maximum concentrated stresses which might be created at pads and

cradles due to shear, bending, and torsion shall also be calculated in accordance with Appendix G of the American Society of Mechanical Engineers, Unfired Pressure Vessel Code, 1968. Fully loaded vehicles shall be assumed to be operating under highway conditions equal to two "g" loading. The effects of fatigue shall be taken into consideration. Cargo tanks mounted on frames may be supported by longitudinal members attached to pads providing the above-stated factors are taken into account.

(v) Where any tank support is attached to any part of a tank head, the stresses imposed upon the head shall be provided for as required in (2)(c)(iv) of this section.

(vi) Tank supports, stops, anchors, and bumpers shall not be welded directly to the tank but shall be attached by means of pads of the same material as the tank. The pad thickness shall be not less than one-fourth inch, or the thickness of the shell material if less, and no greater than the shell material. Each pad shall extend at least four times its thickness, in each direction, beyond the weld attaching the support, bumper, stop, or anchor. Each pad shall be preformed to an inside radius no greater than the outside radius of the tank at the place of attachment. Each pad corner shall be rounded to a radius at least one-fourth the width of the pad, and no greater than one-half the width of the pad. Weepholes and tell-tale holes, if used, shall be drilled or punched before the pads are attached to the tank. Each pad shall be attached to the tank by continuous fillet welding using filler material having properties conforming to the recommendations of the maker of the shell and head material.

(d) Portable or semiportable containers (skid tanks as covered by WAC 296-24-47509(7)(g)) shall meet the applicable requirements of (2)(d)(i) to (vi) of this section inclusive with regard to container valves and accessories and WAC 296-24-47511(4)(c) as to mounting. Containers designed for permanent installation as part of systems under WAC 296-24-47509 shall not be used.

(i) Nonrecessed container fittings and appurtenances shall be protected against damage by either—

- (A) Their location.
- (B) The vehicle frame or bumper, or
- (C) A protective housing. The protective housing, if used, shall comply with the requirements under which the tanks are fabricated with respect to design and construction and shall be designed to withstand static loadings in any direction equal to twice the weight of the tank and attachments when filled with the lading using a safety factor of not less than four, based on the ultimate strength of the material to be used. The housing shall be provided with a weather cover if necessary to insure proper operation of valves and safety devices.

(ii) Filling connections shall be provided with approved automatic back pressure check valves, excess flow check valves or quick closing internal valves to prevent excessive escape of gas in case the filling connection is broken, except that where the filling and discharge connect on a common opening in the container shell, and that opening is fitted with a quick-closing internal valve as specified in (2)(d)(iii) of this section, the automatic

valve shall not be required. In addition every inlet and outlet connection shall be equipped with a manually or automatically operated shutoff valve. Liquid discharge openings, except those for engine fuel lines, on tanks built after September 1, 1965, shall be fitted with a remotely controlled internal shutoff valve. Such valve shall conform to the following requirements:

(A) The seat of the valve shall be inside the tank, or in the opening nozzle or flange, or in a companion flange bolted to the nozzle or flange.

(B) All parts of the valve inside the tank, nozzle, or companion flange shall be made of material not subject to corrosion or other deterioration in the presence of the lading.

(C) The arrangement of parts shall be such that damage to parts exterior to the tank will not prevent effective seating of the valve.

(D) The valve may be operated normally by mechanical means, by hydraulic means, or by air, or gas pressure.

(E) The valve shall be provided with remote means of automatic closure, both mechanical and thermal, in at least two places for tanks over 3,500 gallons water capacity. These remote control stations shall be located at each end of the tank and diagonally opposite each other. The thermal control mechanism shall have a fusible element with a melting point not over 220°F. or less than 208°F. At least one remote control station shall be provided for tanks of 3,500 gallons water capacity or less, and such actuating means may be mechanical.

(iii) All other connections to containers, except those used for gaging devices, thermometer wells, safety relief devices, and plugged openings, shall be provided with suitable automatic excess flow valves, or in lieu thereof may be fitted with quick-closing internal valves.

The control mechanism for the internal valve shall be provided with a secondary control, remote from the fill or discharge connections (for use in the event of accidents or fire during delivery operations), and such control mechanism shall have a fusible element with a melting point not over 220°F. or less than 208°F.

(iv) Manually operated shutoff valves, except as covered in WAC 296-24-47511(2)(a), or self-closing internal valves shall be closed except during transfer operations.

(v) Excess flow valves shall close automatically at the rated flow of vapor or liquid as specified by the valve manufacturers. The flow rating of the piping beyond the excess flow valve shall be greater than that of the excess flow valve and such rating shall include valves, fittings, and hose, except, when branching or necessary restrictions are incorporated in such a piping system so that flow ratings are less than that of the excess flow valve and the tank, then additional excess flow valves shall be installed in the piping where such flow rate is reduced.

(vi) Container inlets and outlets, except those used for safety relief valves, liquid-level gaging devices, and pressure gages, shall be labeled to designate whether they communicate with vapor or liquid space when the container is filled to maximum permitted filling density. (Labels may be on valves).

(3) Capacity of a System. No single fuel container used on passenger carrying vehicles shall exceed 200 gallons water capacity.

(4) Description of a System. A system consists of an assembly of equipment installed on a commercial vehicle.

(5) Location of Containers and Systems. (a) Containers shall not be installed, transported, or stored (even temporarily) inside any vehicle covered by these standards except as provided by the applicable regulations of DOT.

(b) Containers, control valves, and regulating equipment comprising a complete system shall be suitably protected against damage and weather. Systems may be installed in a recess vaportight to the inside of the vehicle and accessible from and vented to the outside.

(c) Systems installed outside of mobile units shall be so located that discharge from safety relief devices shall be not less than 3 feet horizontally away from any opening into the unit below the level of such discharge. When the system is located in a recess vaportight to the inside, vent openings in such recess shall be not less than 3 feet horizontally away from any opening into the mobile unit below the level of these vents.

(d) There shall be no fuel connection between tractor and trailer or other vehicle units.

(e) The container or container carrier shall be secured in place by fastenings designed and constructed with a minimum safety factor of four to withstand loading in any direction equal to twice the weight of the container when filled to normal capacity with LP-Gas.

(6) Container Valves and Accessories. Container valves and accessories shall be provided, protected and mounted as follows:

(a) Systems utilizing DOT cylinders in accordance with WAC 296-24-47507(6).

(b) All other systems in accordance with WAC 296-24-47509(3)(b) through (g).

(c) Portable, semiportable and permanently mounted containers shall be mounted and protected as provided under (2)(b) through (d) of this section.

(7) Safety-Relief Devices. (a) DOT containers shall be provided with safety-relief devices as required by the regulations of DOT.

(b) ASME containers and API-ASME containers shall be provided with safety-relief devices as required by WAC 296-24-47505(10).

(c) A final stage regulator of an LP-Gas system (excluding any appliance regulator) shall be equipped on the low-pressure side with a relief valve which is set to start to discharge within the limits specified in Table H-30. (See WAC 296-24-47509).

(i) The relief valve and space above the regulator and relief valve diaphragms shall be vented to the outside air and terminate at a position to minimize the possibility of vapors accumulating at sources of ignition.

(d) Whenever equipment such as a cargo heater or cooler on commercial vehicles is a type designed to be in operation while in transit, suitable means to stop the flow such as an excess flow valve or other device, shall be installed. This device will be actuated to stop the flow

in the event of the break in the fuel supply line. All excess flow valves shall comply with WAC 296-24-47505(7)(c).

(8) System Design and Line Pressure. Systems may be of either vapor withdrawal or liquid withdrawal type and shall comply with the applicable requirements for the type of usage involved.

(9) System Enclosure and Mounting. (a) Housing or enclosures shall be designed to provide proper ventilation.

(b) Hoods, domes, or removable portions of cabinets shall be provided with means to keep them firmly in place during transit.

(c) Provision shall be incorporated in the assembly to hold the containers firmly in position and prevent their movement during transit in accordance with WAC 296-24-47511(4)(c).

(d) Containers shall be mounted on a substantial support or base secured firmly to the vehicle chassis. Neither the container nor its support shall extend below the frame.

(10) Piping—Including Pipe, Tubing, and Fittings. (a) Regulators shall be connected directly to the container valve outlet or mounted securely by means of support bracket and connected to the container valve or valves with a listed high pressure flexible connector.

(b) Provision shall be made between the regulator outlet and the gas service lines by either a flexible connector or a tubing loop to provide for expansion, contraction, jarring, and vibration.

(c) Pipe, tubing, and fittings shall conform to WAC 296-24-47505(8) except that the use of aluminum alloy piping is prohibited. Steel tubing shall have a minimum wall thickness of 0.049 inch. Steel piping or tubing shall be adequately protected against exterior corrosion.

(d) Approved gas tubing fittings shall be employed for making tubing connections.

(e) The fuel line shall be firmly fastened in a protected location and where under the vehicle and outside and below any insulation or false bottom, fastenings shall be such as to prevent abrasion or damage to the gasline due to vibration. Where the fuel line passes through structural members or floors, a rubber grommet or equivalent shall be installed to prevent chafing.

(f) The fuel line shall be installed to enter the vehicle through the floor directly beneath or adjacent to the appliance which it serves. When a branch line is required the tee connection shall be in the main fuel line and located under the floor and outside the vehicle.

(g) All parts of the system assembly shall be so designed and secured as to preclude such parts working loose during transit.

(11) Appliances. (a) LP-Gas appliances shall be approved for use on commercial vehicles.

(b) In the case of vehicles not intended for human occupancy and where the gas-fired heating appliance is used to protect the cargo, such heater may be of the unvented type but provision shall be made to dispose of the products of combustion to the outside.

(c) In the case of vehicles intended for human occupancy, all gas-fired heating appliances, including water heaters, shall be designed or installed to provide for

complete separation of the combustion system from the atmosphere of the living space. Such appliances shall be installed with the combustion air inlet assembly furnished as a component of the appliance and, also, with either—

(i) The flue gas outlet assembly furnished as a component of the appliance, or

(ii) A listed roof jack if the appliance is listed for such use.

The combustion air inlet assembly, flue gas outlet assembly, and roof jack shall extend to the outside atmosphere.

(d) Provision shall be made to insure an adequate supply of outside air for combustion.

(e) All gas-fired heating appliances and water heaters shall be equipped with an approved automatic device designed to shut off the flow of gas to the main burner and to the pilot in the event the pilot flame is extinguished.

(f) Gas-fired appliances installed in the cargo space shall be located so they are readily accessible.

(g) Appliances shall be constructed or protected to reduce to a minimum possible damage or impaired operation resulting from cargo shifting or handling.

(h) Appliances inside the vehicle shall be located so that a fire at an appliance will not block egress of persons therefrom.

(12) General Precautions. (a) DOT containers shall be marked, maintained, and requalified for use in accordance with the regulations of DOT.

(b) Containers which have not been requalified as required by DOT regulations shall be removed from service. Requalified containers shall be stamped with the date of requalification. When DOT cylinders are requalified by retesting, such retest shall be made in accordance with DOT regulations.

(c) Containers shall not be charged with fuel unless they bear the proper markings of the code or specifications under which they were constructed, and in addition, with their water capacity. In the case of cylinders or portable containers filled by weight, the container shall be marked with its tareweight.

(d) DOT containers which have been involved in a fire shall not be recharged until they have been requalified for service according to DOT regulations.

(e) American Petroleum Institute-American Society of Mechanical Engineers (API-ASME) containers or ASME containers which have been involved in a fire shall not be recharged until they have been retested in accordance with the requirements for their original hydrostatic test and found to be suitable for continued service.

(f) Containers shall not be charged without the consent of the owner.

(g) A permanent caution plate shall be provided on the appliance or adjacent to the container outside of any enclosure. It shall include the word "Caution" and following instructions, or instructions embodying substantially similar language.

(i) Be sure all appliance valves are closed before opening container valve.

(ii) Connections at appliances, regulators, and containers must be checked periodically for leaks with soapy water or its equivalent.

(iii) A match or flame shall not be used to check for leaks.

(iv) Container valves shall be closed when the equipment is not in use.

(13) Charging of Containers. Containers shall be charged as provided in WAC 296-24-47505(12).

(14) Fire Extinguisher. Mobile cook-units shall be provided with at least one approved portable fire extinguisher having a minimum rating of 8-B, C. [Order 76-6, § 296-24-47515, filed 3/1/76; Order 73-5, § 296-24-47515, filed 5/9/73 and Order 73-4, § 296-24-47515, filed 5/7/73.]

WAC 296-24-47517 Liquefied petroleum gas service stations. (1) Application. This section applies to storage containers, and dispensing devices, and pertinent equipment in service stations where LP-Gas is stored and is dispensed into fuel tanks of motor vehicles. See WAC 296-24-47511 for requirements covering use of LP-Gas as a motor fuel. All requirements of WAC 296-24-47505 apply to this section unless otherwise noted.

(2) Design Pressure and Classification of Storage Containers. Storage containers shall be designed and classified in accordance with Table H-34.

(3) Container Valves and Accessories. (a) A filling connection on the container shall be fitted with one of the following:

(i) A combination back-pressure check and excess flow valve.

(ii) One double or two single back-pressure valves.

(iii) A positive shutoff valve, in conjunction with either:

(A) An internal back-pressure valve, or

(B) An internal excess flow valve.

In lieu of an excess flow valve, filling connections may be fitted with a quick-closing internal valve, which shall remain closed except during operating periods. The mechanism for such valves may be provided with a secondary control which will cause it to close automatically in case of fire. When a fusible plug is used its melting point shall not exceed 220°F.

TABLE H-34

Container type	For gases with vapor press. not to exceed lb. per sq. in. gage at 100°F. (37.8 C.)	Minimum design pressure of container, lb. per sq. in. gage	
		1949 and earlier editions of ASME Code (Par. U-68, U-69)	1949 edition of ASME Code (Par. U-200, U-201); 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of ASME Code; All editions of API-ASME Code ²
200 ¹	215	200	250

¹Container type may be increased by increments of 25. The minimum design pressure of containers shall be 100% of the container type designation when constructed under 1949 or earlier editions of ASME Code (Par. U-68 and U-69). The minimum design pressure of containers shall be 125% of the container type designation when constructed under: (1) the 1949 ASME Code (Par. U-200 and U-201), (2) 1950, 1952, 1956, 1959, 1962, 1965, and 1968 (Division I) editions of the ASME Code, and (3) all editions of the API-ASME Code.

²Construction of containers under the API-ASME Code is not authorized after July 1, 1961.

(b) A filling pipe inlet terminal not on the container shall be fitted with a positive shutoff valve in conjunction with either:

- (i) A back pressure check valve, or
- (ii) An excess flow check valve.

(c) All openings in the container except those listed below shall be equipped with approved excess flow check valves:

- (i) Filling connections as provided in (3)(a) of this section.
- (ii) Safety relief connections as provided in WAC 296-24-47505(7)(b).
- (iii) Liquid-level gaging devices as provided in WAC 296-24-47505(7)(d) and (19)(d).
- (iv) Pressure gage connections as provided in WAC 296-24-47505(7)(e).

(d) All container inlets and outlets except those listed below shall be labeled to designate whether they connect with vapor or liquid (labels may be on valves):

- (i) Safety relief valves.
- (ii) Liquid-level gaging devices.
- (iii) Pressure gages.

(e) Each storage container shall be provided with a suitable pressure gage.

(4) Safety-Relief Valves. (a) All safety-relief devices shall be installed as follows:

(i) On the container and directly connected with the vapor space.

(ii) Safety-relief valves and discharge piping shall be protected against physical damage. The outlet shall be provided with loose-fitting rain caps. There shall be no return bends or restrictions in the discharge piping.

(iii) The discharge from two or more safety relief valves having the same pressure settings may be run into a common discharge header. The cross-sectional area of such header shall be at least equal to the sum of the individual discharges.

(iv) Discharge from any safety relief device shall not terminate in any building nor beneath any building.

(b) Aboveground containers shall be provided with safety relief valves as follows:

(i) The rate of discharge, which may be provided by one or more valves, shall be not less than that specified in WAC 296-24-47505(10)(b).

(ii) The discharge from safety relief valves shall be vented to the open air unobstructed and vertically upwards in such a manner as to prevent any impingement of escaping gas upon the container; loose-fitting rain caps shall be used. On a container having a water capacity greater than 2,000 gallons, the discharge from the safety relief valves shall be vented away from the container vertically upwards to a point at least 7 feet above the container. Suitable provisions shall be made so that

any liquid or condensate that may accumulate inside of the relief valve or its discharge pipe will not render the valve inoperative. If a drain is used, a means shall be provided to protect the container, adjacent containers, piping, or equipment against impingement of flame resulting from ignition of the product escaping from the drain.

(c) Underground containers shall be provided with safety relief valves as follows:

(i) The discharge from safety-relief valves shall be piped vertically upward to a point at least 10 feet above the ground. The discharge lines or pipes shall be adequately supported and protected against physical damage.

(ii) Where there is a probability of the manhole or housing becoming flooded, the discharge from regulator vent lines should be above the highest probable water level.

(iii) If no liquid is put into a container until after it is buried and covered, the rate of discharge of the relief valves may be reduced to not less than 30 percent of the rate shown in WAC 296-24-47505(10)(b). If liquid fuel is present during installation of containers, the rate of discharge shall be the same as for aboveground containers. Such containers shall not be uncovered until emptied of liquid fuel.

(5) Capacity of Liquid Containers. Individual storage containers shall not exceed 30,000 gallons water capacity.

(6) Installation of Storage Containers. (a) Each storage container used exclusively in service station operation shall comply with the following table which specifies minimum distances to a building, groups of buildings, and adjoining property lines which may be built upon.

Water capacity per container (gallons)	Minimum distances	
	Aboveground and underground (feet)	Between aboveground containers (feet)
Up to 2,000	25	3
Over 2,000	50	5

NOTE: The above distances may be reduced to not less than 10 feet for service station buildings of other than wood frame construction.

(i) Readily ignitable material including weeds and long dry grass, shall be removed within 10 feet of containers.

(ii) The minimum separation between LP-Gas containers and flammable liquid tanks shall be 20 feet and the minimum separation between a container and the centerline of the dike shall be 10 feet.

(iii) LP-Gas containers located near flammable liquid containers shall be protected against the flow or accumulation of flammable liquids by diking, diversion curbs, or grading.

(iv) LP-Gas containers shall not be located within diked areas for flammable liquid containers.

(v) Field welding is permitted only on saddle plates or brackets which were applied by the container manufacturer.

(vi) When permanently installed containers are interconnected, provision shall be made to compensate for expansion, contraction, vibration, and settling of containers and interconnecting piping. Where flexible connections are used, they shall be of an approved type and shall be designed for a bursting pressure of not less than five times the vapor pressure of the product at 100°F. The use of nonmetallic hose is prohibited for interconnecting such containers.

(vii) Where high water table or flood conditions may be encountered protection against container flotation shall be provided.

(b) Aboveground containers shall be installed in accordance with this section.

(i) Containers may be installed horizontally or vertically.

(ii) Containers shall be protected by crash rails or guards to prevent physical damage unless they are so protected by virtue of their location. Vehicles shall not be serviced within 10 feet of containers.

(iii) Container foundations shall be of substantial masonry or other noncombustible material. Containers shall be mounted on saddles which shall permit expansion and contraction, and shall provide against the excessive concentration of stresses. Corrosion protection shall be provided for tank-mounting areas. Structural metal container supports shall be protected against fire. This protection is not required on prefabricated storage and pump assemblies, mounted on a common base, with container bottom not more than 24 inches above ground and whose water capacity is 2,000 gallons or less if the piping connected to the storage and pump assembly is sufficiently flexible to minimize the possibility of breakage or leakage in the event of failure of the container supports.

(c) Underground containers shall be installed in accordance with this section.

(i) Containers shall be given a protective coating before being placed under ground. This coating shall be equivalent to hot-dip galvanizing or to two coatings of red lead followed by a heavy coating of coal tar or asphalt. In lowering the container into place, care shall be exercised to minimize abrasion or other damage to the coating. Damage to the coating shall be repaired before back-filling.

(ii) Containers shall be set on a firm foundation (firm earth may be used) and surrounded with earth or sand firmly tamped in place. Backfill should be free of rocks or other abrasive materials.

(iii) A minimum of 2 feet of earth cover shall be provided. Where ground conditions make compliance with this requirement impractical, equivalent protection against physical damage shall be provided. The portion of the container to which manhole and other connections are attached need not be covered. If the location is subjected to vehicular traffic, containers shall be protected by a concrete slab or other cover adequate to prevent the weight of a loaded vehicle imposing concentrated direct loads on the container shell.

(7) Protection of Container Fittings. Valves, regulators, gages, and other container fittings shall be protected against tampering and physical damage.

(8) Transport Truck Unloading Point. (a) During unloading, the transport truck shall not be parked on public thoroughfares and shall be at least 5 feet from storage containers and shall be positioned so that shutoff valves are readily accessible.

(b) The filling pipe inlet terminal shall not be located within a building nor within 10 feet of any building or driveway. It shall be protected against physical damage.

(9) Piping, Valves, and Fittings. (a) Piping may be underground, above ground, or a combination of both. It shall be well supported and protected against physical damage and corrosion.

(b) Piping laid beneath driveways shall be installed to prevent physical damage by vehicles.

(c) Piping shall be wrought iron or steel (black or galvanized), brass or copper pipe; or seamless copper, brass, or steel tubing and shall be suitable for a minimum pressure of 250 p.s.i.g. Pipe joints may be screwed, flanged, brazed, or welded. The use of aluminum alloy piping or tubing is prohibited.

(d) All shutoff valves (liquid or gas) shall be suitable for liquefied petroleum gas service and designed for not less than the maximum pressure to which they may be subjected. Valves which may be subjected to container pressure shall have a rated working pressure of at least 250 p.s.i.g.

(e) All materials used for valve seats, packing, gaskets, diaphragms, etc., shall be resistant to the action of LP-Gas.

(f) Fittings shall be steel, malleable iron, or brass having a minimum working pressure of 250 p.s.i.g. Cast iron pipe fittings, such as ells, tees and unions shall not be used.

(g) All piping shall be tested after assembly and proved free from leaks at not less than normal operating pressures.

(h) Provision shall be made for expansion, contraction, jarring, and vibration, and for settling. This may be accomplished by flexible connections.

(10) Pumps and Accessories. All pumps and accessory equipment shall be suitable for LP-Gas service, and designed for not less than the maximum pressure to which they may be subjected. Accessories shall have a minimum rated working pressure of 250 p.s.i.g. Positive displacement pumps shall be equipped with suitable pressure actuated bypass valves permitting flow from pump discharge to storage container or pump suction.

(11) Dispensing Devices. (a) Meters, vapor separators, valves, and fittings in the dispenser shall be suitable for LP-Gas service and shall be designed for a minimum working pressure of 250 p.s.i.g.

(b) Provisions shall be made for venting LP-Gas contained in a dispensing device to a safe location.

(c) Pumps used to transfer LP-Gas shall be equipped to allow control of the flow and to prevent leakage or accidental discharge. Means shall be provided outside the dispensing device to readily shut off the power in the event of fire or accident.

(d) A manual shutoff valve and an excess flow check valve shall be installed downstream of the pump and ahead of the dispenser inlet.

(i) Dispensing hose shall be resistant to the action of LP-Gas in the liquid phase and designed for a minimum bursting pressure of 1,250 p.s.i.g.

(ii) An excess flow check valve or automatic shutoff valve shall be installed at the terminus of the liquid line at the point of attachment of the dispensing hose.

(e) LP-Gas dispensing devices shall be located not less than 10 feet from aboveground storage containers greater than 2,000 gallons water capacity. The dispensing devices shall not be less than 20 feet from any building (not including canopies), basement, cellar, pit, or line of adjoining property which may be built upon and not less than 10 feet from sidewalks, streets, or thoroughfares. No drains or blowoff lines shall be directed into or in proximity to the sewer systems used for other purposes.

(i) LP-Gas dispensing devices shall be installed on a concrete foundation or as part of a complete storage and dispensing assembly mounted on a common base, and shall be adequately protected from physical damage.

(ii) LP-Gas dispensing devices shall not be installed within a building except that they may be located under a weather shelter or canopy provided this area is not enclosed on more than two sides. If the enclosing sides are adjacent to each other, the area shall be properly ventilated.

(f) The dispensing of LP-Gas into the fuel container of a vehicle shall be performed by a competent attendant who shall remain at the LP-Gas dispenser during the entire transfer operation.

(12) Additional Standards. There shall be no smoking on the driveway of service stations in the dispensing areas or transport truck unloading areas. Conspicuous signs prohibiting smoking shall be posted within sight of the customer being served. Letters on such signs shall be not less than 4 inches high. The motors of all vehicles being fueled shall be shut off during the fueling operations.

(13) Electrical. Electrical equipment and installations shall conform to WAC 296-24-47505(17) and (18).

(14) Fire Protection. Each service station shall be provided with at least one approved portable fire extinguisher having at least an 8-B, C, rating. [Order 73-5, § 296-24-47517, filed 5/9/73 and Order 73-4, § 296-24-47517, filed 5/7/73.]

Part F-2

STORAGE AND HANDLING OF ANHYDROUS AMMONIA

WAC

- 296-24-510 Storage and handling of anhydrous ammonia.
- 296-24-51001 Scope.
- 296-24-51003 General.
- 296-24-51005 Definitions.
- 296-24-51007 Use of water in emergencies.
- 296-24-51009 Basic rules.
- 296-24-51011 Systems utilizing stationary, pier-mounted or skid-mounted aboveground or underground, non-refrigerated storage.

- 296-24-51013 Refrigerated storage.
- 296-24-51015 Systems utilizing portable DOT containers.
- 296-24-51017 Systems mounted on trucks, semi-trailers, and trailers for transportation of ammonia.
- 296-24-51019 Systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia.
- 296-24-51021 Systems mounted on farm equipment (implements of husbandry) for the application of ammonia.
- 296-24-51099 Appendix C—Availability of reference materials

WAC 296-24-510 Storage and handling of anhydrous ammonia. [Order 73-5, § 296-24-510, filed 5/9/73 and Order 73-4, § 296-24-510, filed 5/7/73.]

WAC 296-24-51001 Scope. (1) This standard is intended to apply to the design, construction, location, installation, and operation of anhydrous ammonia systems including refrigerated ammonia storage systems.

(2) This standard does not apply to:

(a) Ammonia manufacturing plants.

(b) Refrigeration plants where ammonia is used solely as a refrigerant. Such systems are covered in American National Standard Safety Code for Mechanical Refrigeration, B-9.1. (See Appendix C for availability.) The provisions of ANSI B-9.1 are not appropriate to refrigerated ammonia storage systems as covered in this standard.

(c) Ammonia transportation pipelines. [Order 73-5, § 296-24-51001, filed 5/9/73 and Order 73-4, § 296-24-51001, filed 5/7/73.]

WAC 296-24-51003 General. (1) The term "anhydrous ammonia" as used in this standard refers to the compound formed by a combination of two gaseous elements, nitrogen and hydrogen, in the proportion of one part nitrogen to three parts hydrogen by volume. Anhydrous ammonia may be in either gaseous or liquid form. It is not to be confused with aqua ammonia which is a solution of ammonia gas in water. Whenever the term "ammonia" appears in this standard, it is understood to mean anhydrous ammonia.

(2) It is important that personnel understand the properties of this gas and that they be thoroughly trained in safe practices for its storage and handling. Some of the important physical properties of ammonia are listed in (4) of this section.

(3) Gaseous ammonia liquefies under pressure at ambient temperature. Advantage of this characteristic is taken by industry and for convenience this commodity is usually shipped and stored under pressure as a liquid. When refrigerated to or below its normal boiling point (-28°F) it may be shipped and stored as a liquid at atmospheric pressure.

(4) Physical Properties of Ammonia:

Molecular symbol	NH ₃
Molecular weight	17.032
Boiling point at one atmosphere (one atmosphere = 14.7 psia)	-28°F
Melting point at one atmosphere	-107.9°F
Critical temperature	271.4°F
Critical pressure	1657 psia

Latent heat at -28°F and one atmosphere	589.3 BTU per pound
Relative density of vapor compared to dry air at 32°F and one atmosphere	0.5970
Vapor density at -28°F and one atmosphere	0.05555 lb. per cu. ft.
Specific gravity of liquid at -28°F compared to water at 39.2°F	0.6819
Liquid density at -28°F and one atmosphere	42.57 lb. per cu. ft.
Specific volume of vapor at 32°F and one atmosphere	20.78 cu. ft. per pound
Flammable limits by volume in air at atmospheric pressure	16% to 25%
Ignition Temperature (in a standard quartz container)	1562°F
Specific Heat, Gas, 15 C, one atm at constant pressure, C _p	0.5232 Btu/lb. degree°F.
at constant volume, C _v	0.3995 Btu/lb. degree°F.

(5) Experience has shown that ammonia is extremely hard to ignite and under normal conditions is a very stable compound. It takes temperatures of 840-930°F to cause it to dissociate slightly at atmospheric pressure. The flammable limits at atmospheric pressure are 16% to 25% by volume of ammonia in air. Experiments conducted by a nationally recognized laboratory indicated that an ammonia-air mixture in a standard quartz test container does not ignite below 1562°F. Ammonia is classified by the United States Department of Transportation and the U.S. Coast Guard as a non-flammable compressed gas for the purpose of transportation.

(6) Ammonia should be handled only by properly trained personnel. In no case shall ammonia be used in conjunction with chemicals unless the possible reactions have first been adequately investigated. Under some circumstances ammonia and ammonium compounds can form explosive products with other chemicals. For additional information refer to NFPA 491M "Manual on Hazardous Chemical Reactions" (see Appendix C for availability) and CG-388, the "Chemical Data Guide for Bulk Shipment by Water" (1969 Edition).

(7) Ammonia gas irritates the skin and mucous membrane. At 50 ppm its odor is detectable by most people. The maximum allowable concentration for an 8 hour working exposure is specified as 50 PPM by the American Conference of Government Industrial Hygienists. Because it serves as its own warning agent, no person

will voluntarily remain in concentrations which are hazardous. At 5000 ppm it is rapidly fatal. Since ammonia gas is lighter than air, adequate ventilation is the best means of preventing any accumulation.

(8) The common metals are not attacked by dry ammonia. Zinc, copper and copper base alloys such as brass are subject to rapid destructive action by ammonia in the presence of water. [Order 73-5, § 296-24-51003, filed 5/9/73 and Order 73-4, § 296-24-51003, filed 5/7/73.]

WAC 296-24-51005 Definitions. The following definitions are applicable to all sections of this chapter which include WAC 296-24-510 in the section number and shall be construed to have the meanings below. (1) "Approved" as used in these standards means:

- (a) Listed by a recognized testing laboratory, or
 - (b) Recommended by the manufacturer as suitable for use with anhydrous ammonia and so marked, or
 - (c) Accepted by the authority having jurisdiction.
- (2) "Appurtenance" refers to all devices such as pumps, compressors, safety relief devices, liquid-level gaging devices, valves and pressure gages.
- (3) "Capacity" refers to the total volume of the container measured in U.S. gallons, unless otherwise specified.

(4) "Cylinder" means a container of 1000 pounds water capacity or less constructed in accordance with United States Department of Transportation Specifications.

(5) The "Code" refers to the Unfired Pressure Vessel Code of the American Society of Mechanical Engineers (Section VIII of the ASME Boiler Construction Code), 1952, 1956, 1959, 1962, 1965, 1968 and 1971 editions, the joint code of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME Code) 1951 edition, and subsequent amendments to or later editions of the same, as adopted.

(6) "Container" includes all vessels, tanks, cylinders or spheres used for transportation, storage or application of anhydrous ammonia.

(7) "Design Pressure" is identical to the term "Maximum Allowable Working Pressure" used in the Code.

(8) An "Implement of Husbandry" is a farm wagon-type tank vehicle of not over 3000 gallons capacity, used as a field storage "nurse tank" supplying the fertilizer to a field applicator and moved on highways only for bringing the fertilizer from a local source of supply to farms or fields or from one farm or field to another.

(9) "Filling Density" means the per cent ratio of the weight of the gas in a container to the weight of water at 60°F that the container will hold. One lb. H₂O = 27.737 cu. in. at 60°F. For determining the weight capacity of the tank in pounds, the weight of a gallon (231 cubic inches) of water at 60°F in air shall be 8.32828 pounds.

(10) "Gas" refers to anhydrous ammonia in either the gaseous or liquefied state.

(11) "Gas Mask" refers to gas masks approved by the Bureau of Mines. See American National Standard for Respiratory Protection, Z88.2. (See Appendix C for availability.)

(12) "DOT Regulations" refer to Hazardous Materials Regulations of the Department of Transportation (Title 49—Transportation, Code of Federal Regulations, Parts 171 to 190), including Specifications for Shipping Containers.

(13) "Systems" as used in these standards refers to an assembly of equipment consisting essentially of the container or containers, appurtenances, pumps, compressors, and interconnecting piping.

(14) The abbreviations "psig" and "psia" refer to pounds per square inch gage and pounds per square inch absolute, respectively.

(15) The terms "charging" and "filling" are used interchangeably and have the same meaning.

(16) "Trailer" as used in these standards refers to every vehicle designed for carrying persons or property and for being drawn by a motor vehicle and so constructed that no part of its weight except the towing device rests upon the towing vehicle.

(17) "Tank Motor Vehicle" means any motor vehicle designed or used for the transportation of anhydrous ammonia in any tank designed to be permanently attached to any motor vehicle or any container not permanently attached to any motor vehicle which by reason of its size, construction or attachment to any motor vehicle must be loaded and/or unloaded without being removed from the motor vehicle.

(18) "Semi-trailer" refers to every vehicle designed for carrying persons or property and for being drawn by a motor vehicle and so constructed that some part of its weight and that of its load rests upon or is carried by another vehicle.

(19) "Safety Relief Valve" refers to an automatic spring loaded or equivalent type pressure activated device for gas or vapor service characterized by pop action upon opening, sometimes referred to as a pop valve. (Refer to American National Standard Terminology for Pressure Relief Devices, B95.1.)

(20) "Hydrostatic Relief Valve" refers to an automatic pressure activated valve for liquid service characterized by throttle or slow weep opening (non-pop action). (Refer to American National Standard Terminology for Pressure Relief Devices, B95.1.) [Order 74-27, § 296-24-51005, filed 5/7/74; Order 73-5, § 296-24-51005, filed 5/9/73 and Order 73-4, § 296-24-51005, filed 5/7/73.]

WAC 296-24-51007 Use of water in emergencies.

(1) The concentration of ammonia vapor in air can effectively be reduced by the use of adequate volumes of water applied through spray or fog nozzles.

(2) Water should be used on liquid ammonia spills only if sufficient water is available. For the purpose of this section, sufficient water may be taken to be 100 parts of water to one part of ammonia.

(3) If an ammonia container is exposed to fire and cannot be removed, water should be used to cool it.

(4) Under some circumstances ammonia in a container is colder than the available water supply. Under these circumstances water should not be sprayed on the container walls since it would heat the ammonia and aggravate any gas leak.

(5) If it is found necessary to dispose of ammonia, as from a leaking container, liquid ammonia should be discharged into a vessel containing water sufficient to absorb it. Sufficient water may be taken to be ten parts of water per part ammonia. The ammonia should be injected into the water as near the bottom of the vessel as practical. [Order 73-5, § 296-24-51007, filed 5/9/73 and Order 73-4, § 296-24-51007, filed 5/7/73.]

WAC 296-24-51009 Basic rules. This section applies to all sections of WAC 296-24-510 in the section number unless otherwise noted.

(1) Approval of equipment and systems. Each appurtenance shall be approved in accordance with (1)(a), (b), (c), and (d) of this section.

(a) It was installed before February 8, 1973 and was approved and tested, and installed in accordance with either the provisions of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(b) It is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory, such as, but not limited to, Underwriter's Laboratories Inc. and Factory Mutual Research Corporation; or

(c) It is a type which no nationally recognized testing laboratory does, or will undertake to, accept, certify, list, label, or determine to be safe; and such equipment is inspected or tested by any Federal, State, municipal, or other local authority responsible for enforcing occupational safety provisions of a Federal, State, municipal or other local law, code, or regulation pertaining to the storage, handling, transport, and use of anhydrous ammonia, and found to be in compliance with either the provisions of the American National Standard for the Storage and Handling of Anhydrous Ammonia, K61.1, or the Fertilizer Institute Standards for the Storage and Handling of Agricultural Anhydrous Ammonia, M-1, in effect at the time of installation; or

(d) It is a custom-designed and custom-built unit, which no nationally recognized testing laboratory, or Federal, State, municipal or local authority responsible for the enforcement of a Federal, State, municipal, or local law, code or regulation pertaining to the storage, transportation and use of anhydrous ammonia is willing to undertake to accept, certify, list, label or determine to be safe, and the employer has on file a document attesting to its safe condition following the conduct of appropriate tests. The document shall be signed by a registered professional engineer or other person having special training or experience sufficient to permit him to form an opinion as to safety of the unit involved. The document shall set forth the test bases, test data and results, and also the qualifications of the certifying person.

(e) For the purposes of this section the word "listed" means that equipment is of a kind mentioned in a list which is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and states such equipment meets nationally recognized standards or has been tested and

found safe for use in a specified manner. "Labeled" means there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which makes periodic inspections of the production of such equipment, and whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner. "Certified" means it has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and it bears a label, tag, or other record of certification.

(2) Requirements for construction, original test and requalification of not-refrigerated containers.

(a) Containers used with systems covered in subsections WAC 296-24-51011 and WAC 296-24-51017 through WAC 296-24-51021 of this section shall be constructed and tested in accordance with the Code except that construction under Table UW-12 at a basic joint efficiency of under 80 percent is not authorized.

(i) Containers built according to the Code do not have to comply with Paragraphs UG-125 to UG-128, inclusive, and Paragraphs UG-132 and UG-133 of the Code.

(b) Containers exceeding 36 inches in diameter or 250 gallons water capacity shall be constructed to comply with one or more of the following:

(i) Containers shall be stress relieved after fabrication in accordance with the Code, or

(ii) Cold-formed heads, when used, shall be stress relieved or,

(iii) Hot-formed heads shall be used.

(c) Welding to the shell, head, or any other part of the container subject to internal pressure shall be done in compliance with WAC 296-24-51005(5). Other welding is permitted only on saddle plates, lugs, or brackets attached to the container by the container manufacturer.

(d) Containers used with systems covered by WAC 296-24-51009(3)(b)(iv) shall be constructed and tested in accordance with the DOT specifications.

(e) The provisions of (2)(a) of this section shall not be construed as prohibiting the continued use or reinstallation of containers constructed and maintained in accordance with the 1949, 1950, 1952, 1956, 1959, 1962, 1965 and 1968 editions of the Unfired Pressure Vessel Code of the ASME or any revisions thereof in effect at the time of fabrication.

(3) Markings on Non-Refrigerated Containers and Systems Other Than DOT Containers.

(a) System nameplates, when required, shall be permanently attached to the system so as to be readily accessible for inspection and shall include markings as prescribed in (3)(b) of this section.

(b) Each container or system covered in WAC 296-24-51011, WAC 296-24-51017, WAC 296-24-51019 and WAC 296-24-51021 shall be marked as specified in the following:

(i) With a marking identifying compliance with the rules of the Code under which the container is constructed.

(ii) With a notation on the container and system nameplate when the system is designed for underground installation.

(iii) With the name and address of the supplier of the container or the trade name of the container and with the date of fabrication.

(iv) With the water capacity of the container in pounds at 60F or gallons, U.S. Standard.

(v) With the design pressure in pounds per square inch gage.

(vi) With the wall thickness of the shell and heads.

(vii) With marking indicating the maximum level to which the container may be filled with liquid anhydrous ammonia at temperatures between 20°F. and 100°F. except on containers provided with fixed maximum level indicators, such as fixed length dip tubes, or containers that are filled by weight. Markings shall be in increments of not more than 20°F.

(viii) With the outside surface area in square feet.

(ix) With minimum temperature in Fahrenheit for which the container is designed.

(x) Marking specified on container shall be on the container itself or on a nameplate permanently affixed thereto.

(c) All main operating valves on permanently installed containers having a capacity of over three thousand water gallons shall be identified to show whether the valve is in liquid or vapor service. The recommended method of identification may be legend or color code as specified in (i) and (ii) as follows:

(i) Legend: The legend LIQUID (or LIQUID VALVE), VAPOR (or VAPOR VALVE), as appropriate, shall be placed on or within twelve inches of the valve by means of a stencil tag, or decal.

(ii) Color Code: Liquid valves shall be painted orange and vapor valves shall be painted yellow. The legend ORANGE-LIQUID, YELLOW-VAPOR shall be displayed in one or more conspicuous places at each permanent storage location. The legend shall have letters at least two inches high and shall be placed against a contrasting background. This is in accordance with American National Standard A13.1 "Schemes for Identification of Piping Systems"—1956, Page 5.

(4) Marking Refrigerated Containers. (See WAC 296-24-51013(3). Marking Refrigerated Containers).

(5) Location of Containers. (a) Consideration shall be given to the physiological effects of ammonia as well as to adjacent fire hazards in selecting the location for a storage container. Containers shall be located outside of buildings or in buildings or sections thereof especially approved for this purpose.

(b) Containers shall be located at least 50 feet from a dug well or other sources of potable water supply, unless the container is a part of a water treatment installation.

(c) The location of permanent storage containers shall be outside densely populated areas.

(d) Container locations shall comply with the following table:

Nominal Capacity of Container	Minimum Distances (feet) from Container to:		
	Line of Adjoining Property Which may be Built upon, Highways & Mainline of Railroad	Place of Public Assembly	Institution Occupancy
Over 500 to 2,000	25	150	250
Over 2,000 to 30,000	50	300	500
Over 30,000 to 100,000	50	450	750
Over 100,000	50	600	1,000

(e) Storage areas shall be kept free of readily ignitable materials such as waste, weeds and long dry grass.

(6) Container Appurtenances. (a) All appurtenances shall be designed for not less than the maximum working pressure of that portion of the system on which they are installed. All appurtenances shall be fabricated from materials proved suitable for anhydrous ammonia service.

(b) All connections to containers except safety relief devices, gaging devices, or those fitted with a No. 54 drill size orifice shall have shut-off valves located as close to the container as practicable.

(c) Excess flow valves where required by these standards shall close automatically at the rated flows of vapor or liquid as specified by the manufacturer. The connections and line including valves and fittings being protected by an excess flow valve shall have a greater capacity than the rated flow of the excess flow valve.

(d) Liquid level gaging devices that require bleeding of the product to the atmosphere and which are so constructed that outward flow will not exceed that passed by a No. 54 drill size opening need not be equipped with excess flow valves.

(e) Openings from container or through fittings attached directly on container to which pressure gage connections are made need not be equipped with excess flow valves if such openings are not larger than No. 54 drill size.

(f) Excess flow and back pressure check valves where required by these standards shall be located inside of the container or at a point outside as close as practicable to where the line enters the container. In the latter case, installation shall be made in such manner that any undue stress beyond the excess flow or back pressure check valve will not cause breakage between the container and the valve.

(g) Excess flow valves shall be designed with a bypass, not to exceed a No. 60 drill size opening to allow equalization of pressures.

(h) Shut-off valves provided with an excess flow valve shall be designed for proper installation in a container connection so that the excess flow valve will close should the shutoff valve break.

(i) All excess flow valves shall be plainly and permanently marked with the name or trade-mark of the manufacturer, the catalog number, and the rated capacity.

(7) Piping, Tubing and Fittings. (a) All piping, tubing and fittings shall be made of material suitable for anhydrous ammonia service.

(b) All piping, tubing and fittings shall be designed for a pressure not less than the maximum pressure to which they may be subjected in service.

(c) All piping shall be well supported and provision shall be made for expansion and contraction. All refrigeration system piping shall conform to the Refrigeration Piping Code (ANSI B31.5 1966 addenda B31.1a-1968), a section of the American Standard Code for Pressure Piping, as it applies to ammonia.

(d) Piping used on non-refrigerated systems shall be at least ASTM A-53-1969 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal. Such pipe shall be at least Schedule 40 when joints are welded, or welded and flanged. Such pipe shall be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing shall not be used.

(e) All metal flexible connections for permanent installations shall have a minimum working pressure of 250 psig (safety factor of 4). For temporary installations, hose meeting the requirement of WAC 296-24-51009(8) may be used.

(f) Cast iron fittings shall not be used but this shall not prohibit the use of fittings made specially for ammonia service of malleable or nodular iron such as Specification ASTM A47 or ASTM A395.

(g) Provisions shall be made for expansion, contraction, jarring, vibration, and for settling.

(h) Adequate provisions shall be made to protect all exposed piping from physical damage that might result from moving machinery, the presence of automobiles or trucks, or any other undue strain that may be placed upon the piping.

(i) Joint compounds shall be resistant to ammonia.

(j) After assembly, all piping and tubing shall be tested and proved to be free from leaks at a pressure not less than the normal operating pressure of the system.

(8) Hose Specification. (a) Hose used in ammonia service and subject to container pressure shall conform to the joint Rubber Manufacturers Association and the Fertilizer Institute "Hose Specifications for Anhydrous Ammonia" (See Appendix B).

(b) Hose subject to container pressure shall be designed for a minimum working pressure of 350 psig and a minimum burst pressure of 1750 psig. Hose assemblies, when made up, shall be capable of withstanding a test pressure of 500 psig.

(c) Hose and hose connections located on the low pressure side of flow control or pressure reducing valves on devices discharging to atmospheric pressure shall be designed for the maximum low side working pressure. All connections shall be designed, constructed, and installed so that there will be no leakage when connected.

(d) Where liquid transfer hose is not drained of liquid upon completion of transfer operations, such hose shall be equipped with an approved shut-off valve at the discharge end. Provision shall be made to prevent excessive hydrostatic pressure in the hose. (See WAC 296-24-51009(9)(j).)

(e) On all hose one-half inch O.D. and larger, used for the transfer of anhydrous ammonia liquid or vapor, there shall be etched, cast, or impressed at five-foot intervals the following information:

"Anhydrous Ammonia"
 xxx psig (Maximum working pressure)
 Manufacturer's Name or Trademark
 Year of Manufacture

(9) Safety Relief Devices. (a) Every container used in systems covered by WAC 296-24-51011, WAC 296-24-51017, WAC 296-24-51019 and WAC 296-24-51021 shall be provided with one or more safety relief valves of the spring-loaded or equivalent type. The discharge from safety relief valves shall be vented away from the container, upward and unobstructed to the atmosphere. All safety relief valve discharge openings shall have suitable raincaps that will allow free discharge of the vapor and prevent the entrance of water. Provision shall be made for draining condensate which may accumulate. The rate of the discharge shall be in accordance with the provisions of Appendix A.

(b) Container safety relief valves shall be set to start-to-discharge as follows, with relations to the design pressure of the container.

Containers	Minimum	Maximum*
ASME U-68, U-69	110%	125%
ASME U-200, U-201	95%	100%
ASME 1952, 1956, 1959, 1962, 1965, 1968 or 1971	95%	100%
API-ASME	95%	100%
U.S. Coast Guard		
DOT	[As required by USCG regulations]	[As required by DOT regulations]

*NOTE: A relief valve manufacturer's tolerance of plus 10% is permitted.

(c) Safety relief devices used in systems covered by WAC 296-24-51011, WAC 296-24-51017, WAC 296-24-51019 and WAC 296-24-51021 shall be constructed to discharge at not less than the rates required in subsection (9)(a) before the pressure is in excess of 120% (not including the 10% tolerance referred to in subsection (9)(b) of the maximum permitted start-to-discharge pressure setting of the device.

(d) Safety relief valves shall be so arranged that the possibility of tampering will be minimized. If the pressure setting adjustment is external, the relief valves shall be provided with means for sealing the adjustment.

(e) Shut-off valves shall not be installed between the safety relief valves and the containers or systems described in WAC 296-24-51011, WAC 296-24-51017, WAC 296-24-51019 and WAC 296-24-51021, except that a shut-off valve may be used where the arrangement of this valve is such as always to afford required capacity flow through the relief valves.

NOTE: The above exception is made to cover such cases as a threeway valve installed under two safety relief valves, each of which has the required rate of discharge and is so installed as to allow either of the safety relief valves to be closed off, but does not allow both safety valves to be closed off at the same time. Another exception to this may be where two separate relief valves are installed with individual

shut-off valves. In this case, the two shut-off valve stems shall be mechanically interconnected in a manner which will allow full required flow of one safety relief valve at all times. Still another exception is a safety relief valve manifold which allows one valve of two, three, four or more to be closed off and the remaining valve or valves will provide not less than the rate of discharge shown on the manifold nameplate.

(f) Safety relief valves shall have direct communication with the vapor space of the container.

(g) Each safety relief valve used with systems described in WAC 296-24-51011, WAC 296-24-51017, WAC 296-24-51019 and WAC 296-24-51021 shall be plainly and permanently marked as follows:

(i) With the letters "AA" or the symbol "NH3".

(ii) The pressure in pounds per square inch gage (psig) at which the valve is set to start-to-discharge.

(iii) The rate of discharge of the valve in cubic feet per minute of air at 60F and atmospheric pressure (14.7 psia).

(iv) The manufacturer's name and catalog number.

For example, a safety relief valve marked AA-250-4200 (air) would mean that this valve is suitable for use on an anhydrous ammonia container; that it is set to start-to-discharge at 250 psig; and that its rate of discharge (see WAC 296-24-51009(8)(a) to (c)) is 4200 cubic feet per minute of air.

(h) The flow capacity of the safety relief valve shall not be restricted by any connection to it on either the upstream or downstream side.

(i) The manufacturer or supplier of a safety relief valve manifold shall publish complete data showing the flow rating through the combined assembly of the manifold with safety relief valves installed. The manifold flow rating shall be determined by testing the manifold with all but one valve discharging. If one or more openings have restrictions not present in the remaining openings, the restricted opening or openings or those having the lowest flow shall be used to establish the flow rate marked on the manifold nameplate. The marking shall be similar to that required in subsection (9)(g) for individual valves.

(j) A hydrostatic relief valve shall be installed between each pair of valves in the liquid ammonia piping or hose where liquid may be trapped so as to relieve into the atmosphere at a safe location.

(k) Discharge from safety relief devices shall not terminate in or beneath any building.

(10) Safety. See CGA Pamphlet G-2, TFI Operational Safety Manual M-2 and MCA Safety Data Sheet SD-8 (See Appendix C for availability).

(a) Personnel required to handle ammonia shall be trained in safe operating practices and the proper action to take in the event of emergencies. Personnel shall be instructed to use the equipment listed in subsection (10)(c) in the event of an emergency. [Rev. 1-22-76]

(b) If a leak occurs in an ammonia system, the personnel trained for and designated to act in such emergencies shall:

(i) See that persons not required to deal with an emergency are evacuated from the contaminated area.

(ii) Put on a suitable gas mask.

(iii) Wear gauntlet type plastic or rubber gloves and wear plastic or rubber suits in heavily contaminated atmospheres.

(iv) Shut off the appropriate valves.

(c) All storage systems shall have on hand, as a minimum, the following equipment for emergency and rescue purposes:

*(i) One full face gas mask with anhydrous ammonia refill canisters.

** (ii) One pair of protective gloves.

** (iii) One pair of protective boots.

** (iv) One protective slicker and/or protective pants and jacket.

(v) Easily accessible shower and/or at least 50 gallons of clean water in an open top container.

(iv) Tight fitting vented goggles or one full face shield.

*An ammonia canister is effective for short periods of time in light concentrations of ammonia vapor, generally 15 minutes in concentrations of 3% and will not protect breathing in heavier concentrations. If ammonia vapors are detected when mask is applied the concentration is too high for safety. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use. Unopened canisters may be guaranteed for as long as three years. All should be dated when received because of this limited life. In addition to this protection, an independently supplied air mask of the type used by fire departments may be used for severe emergencies.

**Gloves, boots, slickers, jackets and pants shall be made of rubber or other material impervious to ammonia.

(d) Where several persons are usually present, additional safety equipment may be desirable.

(e) Each tank motor vehicle transporting anhydrous ammonia, except farm applicator vehicles, shall carry a container of at least five gallons of water and shall be equipped with a full face gas mask, a pair of tight-fitting goggles or one full face shield. The driver shall be instructed in their use and the proper action to take to provide for his safety.

(f) If a leak occurs in transportation equipment and it is not practical to stop the leak, the driver should move the vehicle to an isolated location away from populated communities or heavily traveled highways.

(g) If liquid ammonia contacts the skin or eyes, the affected area should be promptly and thoroughly flushed with water. Do not use neutralizing solutions or ointments on affected areas. A physician shall treat all cases of eye exposure to liquid ammonia.

(11) Filling Densities. (See WAC 296-24-51005(9)).

(a) The filling densities for nonrefrigerated containers shall not exceed the following:

Aboveground Underground

- | | | |
|--|------|-----|
| (i) Uninsulated | 56%* | 58% |
| (ii) Insulated | 57% | |
| (iii) DOT containers shall be filled in accordance with DOT regulations. | | |

*This corresponds to 82% by volume at -28F, 85% by volume at 5F, 87.5% by volume at 30F, and 90.6% by volume at 60F.

(b) The filling density for refrigerated storage tanks temperature corresponding to the vapor pressure at the start-to-discharge pressure setting of the safety relief valve.

(c) If containers are to be filled according to liquid level by any gaging method other than a fixed length dip tube gage, each container should have a thermometer well so that the internal liquid temperature can be easily determined and the amount of liquid and vapor in the container corrected to a 60°F. basis.

(12) Transfer of Liquids. (a) Anhydrous ammonia shall always be at a temperature suitable for the material of construction and design of the receiving containers. Ordinary steels are not suitable for refrigerated ammonia. See Appendix R of API Standard 620 "Recommended Rules for Design and Construction of Large Welded Low-Pressure Storage Tanks" for materials for low temperature service.

(b) At least one attendant shall supervise the transfer of liquids from the time the connections are first made until they are finally disconnected.

(c) Flammable gases or gases which will react with ammonia (such as air) shall not be used to unload tank cars or transport trucks.

(d) Containers shall be charged or used only upon authorization of the owner.

(e) Containers shall be gaged and charged only in the open atmosphere or in buildings approved for that purpose.

(f) Pumps used for transferring ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Pumps shall be designed for at least 250 psig working pressure.

(ii) Positive displacement pumps shall have installed, off the discharge port, a constant differential relief valve discharging into the suction port of the pump through a line of sufficient size to carry the full capacity of the pump at relief valve setting, which setting and installation shall be according to pump manufacturer's recommendations.

(iii) On the discharge side of the pump, before the relief valve line, there shall be installed a pressure gage graduated from 0 to 400 psig.

(iv) Plant piping shall contain shutoff valves located as close as practical to pump connections.

(g) Compressors used for transferring or refrigerating ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Compressors, except those used for refrigeration, shall be designed for at least 250 psig working pressure. Crank cases of compressors not designed to withstand

system pressure shall be protected with a suitable safety relief valve.

(ii) Plant piping shall contain shutoff valves located as close as practical to compressor connections.

(iii) A safety relief valve large enough to discharge the full capacity of the compressor shall be connected to the discharge before any shutoff valve.

(iv) Compressors shall have pressure gages at suction and discharge graduated to at least one and one-half times the maximum pressure that can be developed.

(v) Adequate means, such as drainable liquid trap, may be provided on the compressor suction to minimize the entry of liquid into the compressor.

(vi) Where necessary to prevent contamination, an oil separator shall be provided on the discharge side of the compressor.

(h) Loading and unloading systems shall be protected by suitable devices to prevent emptying of the storage container or the container being loaded or unloaded in the event of severance of the hose. Backflow check valves or properly sized excess flow valves shall be installed where necessary to provide such protection. In the event that such valves are not practical, remotely operated shutoff valves may be installed.

(i) Meters used for the measurement of liquid anhydrous ammonia shall be recommended and labeled for ammonia service by the manufacturer.

(i) Liquid meters shall be designed for a minimum working pressure of 250 psig.

(ii) The metering system shall incorporate devices that will prevent the inadvertent [inadvertent] measurement of vapor.

(13) Tank Car Unloading Points and Operations. (a) Provisions for unloading tank cars shall conform to the Regulations of the Department of Transportation.

(b) Unloading operations shall be performed by reliable persons properly instructed and made responsible for careful compliance with all applicable procedures.

(c) Caution signs shall be so placed on the track or car as to give necessary warning to persons approaching car from open end or ends of siding and shall be left up until after car is unloaded and disconnected from discharge connections. Signs shall be of metal or other suitable material, at least 12 by 15 inches in size and bear the words "STOP—Tank Car Connected" or "STOP—Men At Work" the word "STOP", being in letters at least 4 inches high and the other words in letters at least 2 inches high. The letters shall be white on a blue background.

(d) The track of a tank car siding shall be substantially level.

(e) Brakes shall be set and wheels blocked on all cars being unloaded.

(f) Tank cars of anhydrous ammonia shall be unloaded only at approved locations meeting the requirements of WAC 296-24-51009(9)(c) and (12)(h) of this section.

(14) Liquid Level Gaging Device. (a) Each container except those filled by weight shall be equipped with an approved liquid level gaging device.

(b) All gaging devices shall be arranged so that the maximum liquid level to which the container is filled is

readily determined. (See WAC 296-24-51009(4)(b)(vii)).

(c) Gaging devices that require bleeding of the product to the atmosphere such as the rotary tube, fixed tube, and slip tube devices, shall be designed so that the maximum opening of the bleed valve is not larger than No. 54 drill size unless provided with an excess flow valve. (This requirement does not apply to farm vehicles used for the application of ammonia as covered in WAC 296-24-51021.)

(d) Gaging devices shall have a design pressure equal to or greater than the design pressure of the container on which they are installed.

(e) Fixed liquid level gages shall be so designed that the maximum volume of the container filled by liquid shall not exceed 85% of its water capacity. The coupling into which the fixed liquid level gage is threaded must be placed at the 85% level of the container. If located elsewhere, the dip tube of this gage must be installed in such a manner that it cannot be readily removed.

NOTE: This does not apply to refrigerated storage.

(f) Gage glasses of the columnar type shall be restricted to stationary storage installation. They shall be equipped with shutoff valves having metallic handwheels, with excess-flow valves, and with extra heavy glass adequately protected with a metal housing applied by the gage manufacturer. They shall be shielded against the direct rays of the sun.

(15) Painting of Containers. Aboveground uninsulated containers should have a reflective surface maintained in good condition. White is recommended for painted surfaces, but other light reflecting colors are acceptable.

(16) Electrical Equipment and Wiring. (a) Electrical equipment and wiring for use in ammonia installations shall be general purpose or weather resistant as appropriate.

(b) Where concentrations of ammonia in air in excess of 16% by volume are likely to be encountered, electrical equipment and wiring shall be of a type specified by and be installed in accordance with National Electrical Code, NFPA 70 (ANSI-C1), for Class I, Group D locations. [Order 76-6, § 296-24-51009, filed 3/1/76; Order 74-27, § 296-24-51009, filed 5/7/74; Order 73-5, § 296-24-41009, filed 5/9/73 and Order 73-4, § 296-24-51009, filed 5/7/73.]

WAC 296-24-51011 Systems utilizing stationary, pier-mounted or skid-mounted aboveground or underground, non-refrigerated storage. This section applies to stationary, pier-mounted, skid-mounted, aboveground or underground, non-refrigerated storage installations utilizing containers other than those constructed in accordance with Department of Transportation Specifications. All Basic Rules of WAC 296-24-51009 apply to this section unless otherwise noted.

(1) Design Pressure and Construction of Containers. The minimum design pressure for non-refrigerated aboveground containers shall be 250 psig. (See WAC 296-24-51009(2)(a)(i).)

NOTE: U-68 and U-69 ASME Code containers with a design pressure of 200 psig are acceptable if

recertified to 250 psig and equipped with safety relief valves set at 250 psig as permitted in WAC 296-24-51009(9)(b).

(2) Container Valves and Accessories, Filling and Discharging Connections. (a) Each filling connection shall be provided with combination back-pressure check valve and excess flow valve; one double or two single back-pressure check valves; or a positive shutoff valve in conjunction with either an internal back-pressure check valve or an internal excess flow valve.

(b) All vapor and liquid connections, except safety relief valves and those specifically exempt in WAC 296-24-51009(6)(d) and (e) shall be equipped with approved excess flow valves; or in lieu thereof, may be fitted with approved quick-closing internal valves which, except during operating periods, shall remain closed.

(c) Each storage container shall be provided with a pressure gage graduated from 0 to 400 psig. Gages shall be designated for use in ammonia service.

(d) All containers shall be equipped with an approved vapor return valve.

(e) All containers shall be equipped with a fixed maximum liquid level gage.

(3) Safety Relief Devices. (a) Every container shall be provided with one or more safety relief valves of spring-loaded or equivalent type and shall comply with the following:

(i) The discharge from safety relief valves shall be directed away from the container upward and unobstructed to the open air. Vent pipes shall not be restrictive or smaller in size than the safety relief outlet connection. All safety relief valve discharges shall have suitable rain caps that will allow free discharge of the vapor and prevent the entrance of water. Suitable provision shall be made for draining condensate which may accumulate.

(ii) If desired, vent pipes from two or more safety relief devices located on the same unit, or similar lines from two or more different units, may be run into a common header, provided the cross-sectional area of such header is at least equal to the sum of the cross-sectional areas of the individual vent pipes.

(b) The rate of discharge of spring-loaded safety relief valves installed on underground containers may be reduced to a minimum of 30 percent of the rate of discharge specified in Appendix A. Containers so protected shall not be uncovered after installation until the liquid ammonia has been removed. Containers which may contain liquid ammonia before being installed underground and before being completely covered with earth are to be considered aboveground containers when determining the rate of discharge requirements of the safety relief valves.

(c) On underground installations where there is a probability of the manhole or housing becoming flooded, the discharge from vent lines shall be located above the high water level. All manholes or housings shall be provided with ventilated louvres or their equivalent, the area of such openings equaling or exceeding combined discharge areas of safety relief valves and vent lines which discharge their content into the manhole housing.

(4) Installation of Storage Containers. (a) Containers installed aboveground shall be provided with substantial reinforced concrete footings and foundations or structural steel supports mounted on reinforced concrete foundations. In either case, the reinforced concrete foundations or footings shall extend below the established frost line and shall be of sufficient width and thickness to support the total weight of the containers and contents adequately. The foundation shall maintain the lowest point of the tank at not less than 18 inches above the ground. Floating type foundations shall also be acceptable providing the foundations are designed to adequately support the tank, contents and pumping equipment. (See WAC 296-24-51009(7).)

(b) Horizontal aboveground containers shall be mounted on foundations in such a manner as to permit expansion and contraction. Every container shall be supported so as to prevent the concentration of excessive loads on the supporting portion of the shell. The bearing afforded by the saddles shall extend over at least one third of the circumference of the shell. Suitable means for preventing corrosion shall be provided on that portion of the container in contact with the foundations or saddles.

(c) Containers buried underground shall be placed so that the top of the container is at least one foot below the surface of the ground. Should ground conditions make compliance with these requirements impracticable, precautions shall be taken to prevent physical damage to the container. It is not necessary to cover the portion of the container to which a manhole and other connections are affixed when necessary to prevent floating, containers shall be securely anchored or weighted.

(d) Underground containers shall be set on firm foundations (firm earth may be used) and surrounded with soft earth or sand well tamped in place. As a further means of resisting corrosion, the container, prior to being placed underground, shall be given a protective coating satisfactory to the authority having jurisdiction. Such protective coating shall be equivalent to hot dip galvanizing, or to two preliminary coatings of red lead followed by a heavy coating of coal tar or asphalt. The container thus coated shall be lowered into place in such a manner as to prevent abrasion or other damage to the coating.

(e) Distance between aboveground and underground containers of over 1,200 gallons capacity shall be at least five feet.

(f) Secure anchorage or adequate pier height shall be provided against container flotation wherever sufficiently high flood water might occur.

(5) Reinstallation of Containers. (a) Containers once installed underground shall not later be reinstalled aboveground or underground, unless they successfully withstand hydrostatic pressure retests at the pressure specified for the original hydrostatic test as required by the code under which the tank was constructed and show no evidence of serious corrosion.

(b) Where containers are reinstalled underground, the corrosion resistant coating shall be put in good condition; see WAC 296-24-51011(4)(d). Where containers

are reinstalled aboveground, safety relief devices or gagging devices shall comply with WAC 296-24-51009(9) and WAC 296-24-51011(3) respectively for aboveground containers.

(6) Marking of Containers. Each container or group of containers shall be marked on at least two sides with the words "Anhydrous Ammonia" or "Caution—Ammonia" in sharply contrasting colors with letters not less than four inches high.

(7) Protection of Container Appurtenances. (a) Valves and other appurtenances shall be protected against physical damage. Main container shut-off valves shall be kept closed and locked when the installation is unattended. If the facility is protected against tampering by fencing or other suitable means, valve locks are not required.

(b) All connections to underground containers should be located within a substantial dome, housing or manhole fitted with a substantial removable cover. Appurtenances shall also be protected during the transit of containers intended for installation underground.

(c) Storage containers need not be grounded.

(8) Identification. A sign shall be displayed in a conspicuous place stating the name, address, and phone number of the nearest representative, agent, or owner of the storage system. [Order 76-6, § 296-24-51011, filed 3/1/76; Order 73-5, § 296-24-51011, filed 5/9/73 and Order 73-4, § 296-24-51011, filed 5/7/73.]

WAC 296-24-51013 Refrigerated storage. This section applies specifically to systems utilizing tanks for the storage of anhydrous ammonia under refrigerated conditions. All Basic Rules of WAC 296-24-51009 apply to this section unless inconsistent with the requirements of this section.

(1) Design of Tanks. (a) Tanks may be designed for any storage pressure desired as determined by economical design of the refrigerated system.

(b) The design temperature shall be the minimum temperature to which the container will be refrigerated and shall be so designated.

(c) Containers with a design pressure exceeding 15 p.s.i.g. shall be constructed in accordance with WAC 296-24-51009(2) and the material shall be selected from those listed in API Standards 620, 4th edition 1970, Recommended Rules for Design and Construction of Large, Welded Low-Pressure Storage Tanks, Tables 2.02, R.2.1, R.2.2, R.2.3 or R.2.4.

(d) Tanks with a design pressure of 15 psig and less shall be constructed in accordance with the general requirements of API Standard 620, 4th edition, 1970, including Appendix R.

(e) When austenitic steels or nonferrous materials are used, the ASME Code shall be used as a guide in selection of materials for use at the design temperature.

(f) The filling density for refrigerated storage containers shall be such that the container will not be liquid full at a liquid temperature corresponding to the vapor pressure at the start-to-discharge pressure setting of the safety-relief valve. [New 1-22-76]

(2) Installation of Storage Tanks. (a) Tanks shall be supported on suitable non-combustible foundations designed to accommodate the type of tank being used.

(b) Adequate protection against flotation or other water damage shall be provided wherever high flood water might occur.

(c) Tanks for product storage at less than 32F shall be supported in such a way, or heat shall be supplied, to prevent the effects of freezing and consequent frost heaving.

(d) The area surrounding a refrigerated tank or group of tanks shall be provided with drainage, or shall be diked to prevent accidental discharge of liquid from spreading to uncontrolled areas.

(e) When drainage is employed, a slope of not less than one percent shall be provided. The drainage system shall terminate in an impounding basin having a capacity as large as the largest tank served.

(f) Provision shall be made for drainage of rain water from the diked or impounding area. Such drainage shall not permit the release of ammonia.

(g) When a dike surrounding the tank is employed, the capacity of the diked enclosure shall be as large as the largest tank served.

(h) The walls of a diked enclosure or the wall of an impounding basin used in a drainage system shall be of earth, steel or concrete designed to be liquid tight and to withstand the hydrostatic pressure and the temperature. Earth walls shall have a flat top at least 2 feet wide. The slope shall be stable and consistent with the angle of repose of the earth used.

(i) The ground in an impounding basin or within a diked enclosure, should be graded so that small spills, or the early part of a large spill, will accumulate at one side or corner contacting a relatively small area of ground and exposing a relatively small surface area for heat gain. Shallow channels in the ground surface or low curbs of earth can help guide the liquid to these low areas without contacting a large ground area.

(3) Marking Refrigerated Containers. (a) Each refrigerated container shall be marked with a nameplate on the outer covering in an accessible place as specified in the following:

(i) With the name and address of the builder and the date of fabrication.

(ii) With the maximum volume or weight of the product whichever is most meaningful to user.

(iii) With the design pressure.

(iv) With the minimum temperature in degrees Fahrenheit for which the container was designed.

(v) With the maximum allowable water level to which the container may be filled for the test purposes.

(vi) With the density of the product in pounds per cubic foot for which the container was designed.

(vii) With the maximum level to which the container may be filled with liquid anhydrous ammonia.

(4) Tank Valves, Fill Pipes and Discharge Pipes. (a) Shut-off valves shall be:

(i) Provided for all connections except those with a No. 54 drill size restriction, plugs, safety valves, thermometer wells, and

(ii) Located as close to the tank as practicable.

(b) When operating conditions make it advisable, a check valve shall be installed on the fill connection and a remotely operated shut-off valve on other connections located below the maximum liquid level.

(5) Safety Relief Devices. (a) Safety relief valves shall be set to start-to-discharge at a pressure not in excess of the design pressure of the tank and shall have a total relieving capacity sufficient to prevent a maximum pressure in a tank of more than 120% of the design pressure.

(b) The total relieving capacity shall be the larger requirement of WAC 296-24-51013(5)(b)(i) or (ii).

(i) Possible refrigeration system upset such as (A) cooling water failure, (B) power failure, (C) instrument air or instrument failure, (D) mechanical failure of [of] any equipment, (E) excessive pumping rates, (F) changing atmospheric conditions.

(ii) Either one of the following formulas for fire exposure, (1) for valve manufacturers who use weight of vapors to be relieved as basis for classifying valves:

$$W = \frac{34,500 F A(\text{superscript } 0.82)}{L}$$

or (2) for valve manufacturers that classify valves on the basis of air flow:

$$Q_a = \frac{633,000 F A(\text{superscript } 0.82)}{L C} \sqrt{\frac{Z T}{M}}$$

Where

W = weight of vapors to be relieved in pounds/hour at relieving conditions;

Q_a = air flow in cubic feet per minute at standard conditions (60F and 14.7 psi);

F = fireproofing credit. Use F = 1.0 except when an approved fireproofing material of recommended thickness is used, then use F = 0.2.

A = total surface area in square feet up to 25 feet above grade or to the equator of a sphere, whichever is greater;

Z = compressibility factor of ammonia at relieving conditions (if not known, use Z = 1.0);

T = temperature in degrees R (460 + temperature in degrees F of gas at relieving conditions);

M = molecular weight = 17 for ammonia;

L = latent heat of ammonia at relieving conditions;

C = constant based on relation of specific heats. (C may be obtained from the following table.)

(If K is not known use C = 315.)

K	C	K	C	K	C
1.00	315	1.26	343	1.52	366
1.02	318	1.28	345	1.54	368
1.04	320	1.30	347	1.56	369
1.06	322	1.32	349	1.58	371
1.08	324	1.34	351	1.60	372
1.10	327	1.36	352	1.62	374

K	C	K	C	K	C
1.12	329	1.38	354	1.64	376
1.14	331	1.40	356	1.66	377
1.16	333	1.42	358	1.68	379
1.18	335	1.44	359	1.70	380
1.20	337	1.46	361	2.00	400
1.22	339	1.48	363	2.20	412
1.24	341	1.50	364		

Where K = C_p/C_v at atmospheric conditions and

C_p = Specific heat of vapor at constant pressure.

C_v = Specific heat of vapor at constant volume.

(c) Shut-off valves of adequate flow capacity [capacity] may be provided and used to facilitate inspection and repair of safety relief valves. When a shut-off valve is provided it shall be so arranged that it can be locked or sealed open, and it shall not be closed except by an authorized person who shall remain stationed there while the valve remains closed, and who shall again lock or seal the valve open when leaving the station.

(d) Safety relief devices shall comply with the following:

(i) If stacks are used they shall be suitably designed to prevent obstruction by rain, snow, ice or condensate. The outlet size shall not be smaller than the nominal size of the safety relief valve outlet connection.

(ii) Discharge lines may be used if desired. Multiple safety relief valves on the same storage unit may be run into a common discharge header. The discharge line and header shall be designed to accommodate the maximum flow and a back pressure not exceeding 10% of the design pressure of the storage container. This back pressure shall be included in the 120% total maximum pressure given in WAC 296-24-51013(5)(a). No other container or system shall exhaust into this discharge line or header. The vent lines shall be installed to prevent accumulation of liquid in the lines.

(e) Atmospheric storage shall be provided with vacuum breakers. Ammonia gas may be used to provide a pad.

(6) Protection of Container Appurtenances. Refrigerated storage containers shall comply with the provisions of WAC 296-24-51011(7).

(7) Reinstallation of Containers. Containers of such size as to require field fabrication shall, when moved and reinstalled, be reconstructed and reinspected in complete accordance with the code under which they were constructed. The containers shall be subjected to a pressure retest, and if rerating is necessary, it shall be done in accordance with the applicable code pressures.

(8) Damage From Vehicles. Precaution shall be taken to avoid any damage by trucks, tractors, or other vehicles.

(9) Refrigeration Load and Equipment. (a) The total refrigeration load shall be computed as the sum of the following:

(i) Load imposed by heat flow into the container caused by the temperature differential between the ambient temperature and the design storage temperature.

(ii) Load imposed by heat flow into the tank caused by maximum sun radiation.

(iii) Maximum load imposed by filling the tank with ammonia warmer than the design storage temperature.

(b) More than one storage tank may be handled by the same refrigeration system.

(c) Compressors. (See also WAC 296-24-51009(12)(g).) (i) A minimum of two compressors shall be provided, either of which if of sufficient size to handle the loads listed in WAC 296-24-51013(9)(a)(i) and (ii). Where more than two compressors are provided, minimum standby equipment equal to the largest normally operating equipment shall be installed. Compressors required for WAC 296-24-51013(9)(a)(iii) may be used as standby equipment for compressors required in WAC 296-24-51013(9)(a)(i) and (ii).

(ii) Compressors shall be sized to operate with a suction pressure at least 10% below the minimum setting of the safety relief valve(s) on the storage tank and shall withstand a suction pressure at least equal to 120% of the design pressure of the tank. Discharge pressure will be governed by condensing conditions.

(d) Compressor Drives. (i) Each compressor shall have its individual driving unit.

(ii) Any standard drive consistent with good design may be used.

(iii) An emergency source of power of sufficient capacity to handle the loads listed in WAC 296-24-51013(9)(a)(i) and (ii) shall be provided, unless facilities are provided to safely dispose of vented vapors while the refrigeration system is not operating.

(e) Automatic Control Equipment. (i) The refrigeration system shall be arranged with suitable controls to govern the compressor operation in accordance with the load as evidenced by the pressure in the container(s).

(ii) An emergency alarm system shall be installed to function in the event the pressure in the container(s) rises to the maximum or falls to the minimum allowable operating pressure.

(iii) An emergency alarm and shut-off shall be located in the condenser system to respond to excess discharge pressure caused by failure of the cooling medium.

(iv) All automatic controls shall be installed in a manner to preclude operation of alternate compressors unless the controls will function with the alternate compressors.

(f) Separators. (i) An entrainment separator of suitable size and design pressure shall be installed in the compressor suction line. The separator shall be equipped with a drain and gaging device.

(ii) An oil separator of suitable size shall be installed in the compressor discharge line. It shall be designed for at least 250 psig and shall be equipped with a gaging device and drain valve.

(g) Condensers. The condenser system may be cooled by air or water or both. The condenser shall be designed for at least 250 psig. Provision shall be made for purging non-condensibles either manually or automatically.

(h) Receiver and Liquid Drain. A receiver shall be provided which is equipped with an automatic float valve to discharge the liquid ammonia to storage or with a high pressure liquid drain trap of suitable capacity. The

receiver shall be designed for at least 250 psig operating pressure and be equipped with the necessary connections, safety relief valves and gaging device.

(i) Insulation. Refrigerated containers and pipe lines which are insulated shall be covered with a material of suitable quality and thickness for the temperatures encountered. Insulation shall be suitably supported and protected against the weather. Weatherproofing shall be of a type which will not support flame propagation.

(10) Safety Equipment. All refrigerated storage plants shall have on hand the minimum safety equipment required under WAC 296-24-51009(10)(c). [Order 76-6, § 296-24-51013, filed 3/1/76; Order 73-5, § 296-24-51013, filed 5/9/73 and Order 73-4, § 296-24-51013, filed 5/7/73.]

WAC 296-24-51015 Systems utilizing portable DOT containers. This section applies specifically to systems utilizing cylinders, portable tanks (DOT-51), or "ton containers" (DOT-106A, DOT-110A), constructed in accordance with Department of Transportation Specifications. All Basic Rules of WAC 296-24-51009 apply to this section, unless otherwise noted.

(1) Containers. (a) Containers shall comply with Department of Transportation Specifications and shall be maintained, filled, packaged, marked, labeled and shipped to comply with current DOT Regulations and American National Standard Method of Marking Portable Compressed Gas Containers To Identify the Material Contained, Z48.1. (See Appendix C for availability.)

(b) Containers shall be stored in an area free from ignitable debris and in such manner as to prevent external corrosion. (Storage may be indoors or outdoors.)

(c) Containers shall not be buried below ground.

(d) Containers shall be set upon firm foundations or otherwise firmly secured. The possible effect of settling on the outlet piping shall be guarded against by a flexible connection or special fitting.

(e) Containers shall be protected from heat sources such as radiant flame and steam pipes. Do not apply heat directly to containers to raise the pressure.

(f) Containers shall be stored in such manner as to protect them from moving vehicles or external damage.

(g) Any container which is designed to have a valve protection cap shall have the cap securely in place when the container is not in service.

(2) Container Valves and Regulating Equipment. (a) Container valves and pressure regulating equipment shall be protected against tampering when installed for use.

(b) Container valves shall be protected while in transit, in storage, and while being moved into final utilizations, as follows:

(i) By setting them into a recess of the container, or

(ii) By ventilated cap or collar, fastened to the container, capable of withstanding a blow from any direction equivalent to that of a 30-lb. weight dropped four feet. Construction must be such that a blow will not be transmitted to the valves or other connections.

(c) When containers are not connected for service, the outlet valves shall be kept tightly closed even though containers are considered empty.

(3) Safety Relief Devices. Containers shall be provided with safety relief devices as required by Department of Transportation Regulations. [Order 73-5, § 296-24-51015, filed 5/9/73 and Order 73-4, § 296-24-51015, filed 5/7/73.]

WAC 296-24-51017 Systems mounted on trucks, semi-trailers, and trailers for transportation of ammonia. This section applies specifically to systems mounted on trucks, semi-trailers and trailers (other than those covered under WAC 296-24-51019 and WAC 296-24-51021) used for the transportation of ammonia. All Basic Rules of WAC 296-24-51009 apply to this section unless otherwise noted. Systems for trucks and trailers for transportation of anhydrous ammonia, in addition to complying with the requirements of these standards, shall also comply where required, with the requirements of the Department of Transportation and those of any other regulatory body which may apply.

(1) Design Pressure of Containers. (a) Containers used in intrastate commerce shall be constructed in accordance with WAC 296-24-51009(2) with a minimum design pressure of 250 psig. Containers used in interstate commerce shall meet DOT Regulations.

(b) The shell or head thickness of any container shall not be less than 3/16 inch.

(c) All container openings, except safety relief valves, liquid level gaging devices and pressure gages, shall be labeled to designate whether they communicate with liquid or vapor space. Labels may be on valves.

(d) Baffles are not required for cargo tanks.

(2) Mounting Containers on Truck. (a) The means of attachment of any container to the cradle, frame or chassis of a vehicle shall be designed on a basis of two "g" loading in either direction, using a safety factor of not less than 4, based on the ultimate strength of the material used. For purposes of this requirement, two "g" of load support is equivalent to three times the static weight of the articles supported; two "g" of loading and bending, acceleration, and torsion is equivalent to twice the static weight support applied horizontally at the road surface.

(b) "Hold-down" devices, when used, shall anchor the container to the cradle, frame or chassis in a suitable and safe manner that will not introduce undue concentration of stresses. These devices shall incorporate positive means for drawing the container down tight, and suitable stops or anchors shall be provided to prevent relative movement between container and framing due to stopping, starting or changes in direction.

(c) Vehicles designed and constructed so that the cargo tanks constitute in whole or in part the stress member used in lieu of the frame shall be supported by external cradles suspending at least 120° of the shell circumference. The design calculation shall include beam stress, shear stress, torsion stress, bending moment and acceleration stress, in addition to those covered by the code under which the cargo tank was designed.

(d) If a liquid withdrawal line is installed in the bottom of a container, the connections thereto, including hose, shall not be lower than the lowest horizontal edge of the trailer axle.

(e) Provisions shall be made to secure both ends of the hose while in transit.

(f) When the cradle and the container are not welded together, suitable material shall be used between them to eliminate metal-to-metal friction.

(3) Container Appurtenances. (a) Non-recessed container fittings and appurtenances shall be protected against physical damage by either: (i) a protected location, (ii) the vehicle frame or bumper, or (iii) a protective housing. The protective housing, if used, shall comply with the requirements under which the containers are fabricated with respect to design and construction, and shall be designed to withstand static loadings in any direction equal to twice the weight of the container and attachments when filled with the lading using a safety factor of not less than 4, based on the ultimate strength of the material to be used. The protective housing if used shall be protected with a weather cover, if necessary, to insure proper operation of valves and safety relief devices.

(b) All connections to containers, except filling connections (see WAC 296-24-51017(3)(c)), safety relief devices, and liquid level and pressure gage connections, shall be provided with suitable automatic excess flow valves, or in lieu thereof, may be fitted with quick-closing internal valves, which shall remain closed except during delivery operations. The control mechanism for such valves may be provided with a secondary control remote from the delivery connections and such control mechanism shall be provided with a fusible section (meltin [melting] point 208F to 220F) which will permit the internal valve to close automatically in case of fire.

(c) Filling connections shall be provided with automatic back-pressure check valves, excess-flow check valves, or quick-closing internal valves, to prevent back-flow in case the filling connection is broken. Where the filling and discharge connect to a common opening in the container shell and that opening is fitted with a quick-closing internal valve as specified in WAC 296-24-51017(3)(b), the automatic valve shall not be required.

(d) All containers shall be equipped for spray loading (filling in the vapor space) or with an approved vapor return valve of adequate capacity.

(e) All containers shall be equipped with a fixed maximum liquid level gage.

(f) All containers shall be equipped with a pressure-indicating gage having a dial graduated from 0-400 psig.

(4) Piping and Fittings. (a) All piping, tubing and fittings shall be securely mounted and protected against physical damage.

(b) Piping used on non-refrigerated systems shall be at least ASTM A-53 Grade B Electric Resistance Welded and Electric Flash Welded Pipe or equal. Such pipe shall be at least Schedule 40 when joints are welded, or welded and flanged. Such pipe shall be at least Schedule 80 when joints are threaded. Brass, copper, or galvanized steel pipe or tubing shall not be used.

(c) The truck unloading line shall be provided with an excess flow valve at the hose connection unless an approved quick closing internal valve is provided in the

container unloading connection. (See WAC 296-24-51017(3)(b).)

(5) Safety Relief Devices. The discharge from container safety relief valves shall be vented away from the container upward and unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container; loose fitting rain caps shall be used. Size of discharge lines from safety relief valves shall not be smaller than the nominal size of the safety relief valve outlet connection. Suitable provision shall be made for draining condensate which may accumulate in the discharge pipe.

(6) Marking of Container. Every container, whether loaded or empty, shall be conspicuously and legibly marked on each side and rear thereof on a background of sharply contrasting color with the words "COMPRESSED GAS" in letters at least four inches high; or with the words "ANHYDROUS AMMONIA" in letters at least four inches high; or in compliance with Department of Transportation Regulations.

(7) Transfer of Liquids. (a) The content of tank motor vehicle containers shall be determined by weight, by suitable liquid level gaging devices, meters, or other approved methods.

NOTE: If the content of a container is to be determined by liquid level measurement, the container shall have a thermometer well so that the internal liquid temperature can be easily determined. This volume when converted to weight shall not exceed the filling density specified by the Department of Transportation Regulations.

(b) Pumps or compressors shall be designed and installed in accordance with WAC 296-24-51009(12) and protected against physical damage when mounted upon ammonia tank trucks and trailers.

(c) Tank motor vehicles of greater than 3500 water gallons capacity shall be unloaded only at approved locations meeting the requirements of WAC 296-24-51009(10)(c) and (12)(h).

(8) Trailers and Semi-Trailers. (a) Trailers shall be firmly and securely attached to the vehicle drawing them by means of suitable drawbars, supplemented by suitable safety chain (or chains) or safety cables.

(b) Every trailer and semi-trailer shall be equipped with an emergency braking system to be activated in the event of hitch failure.

(c) Trailers shall be of a type of construction which will prevent the towed vehicle from whipping or swerving dangerously from side to side and which will cause it to follow substantially in the path of the towing vehicle.

(d) Where a fifth wheel is employed on a semi-trailer, it shall be ruggedly designed, securely fastened to both units, and equipped with a positive locking mechanism which will prevent separation of the two units except by manual release.

(e) Every trailer or semi-trailer shall be provided with side lights and a tail light.

(9) Electrical Equipment and Lighting. Tank trucks, tank trailers, and tank semi-trailers, may not be equipped with any artificial light other than electric

light. Electric lighting circuits shall have suitable over-current protection (fuses or automatic circuit breakers). The wiring shall have sufficient carrying capacity and mechanical strength, and shall be suitably secured, insulated and protected against physical damage.

(10) Protection Against Collision. Each tank motor vehicle shall be provided with properly attached bumpers or chassis extensions arranged to protect the tank, piping, valves and fittings from physical damage in case of collision.

(11) Chock Blocks. At least two chock blocks shall be provided. These blocks shall be placed to prevent rolling of the vehicle whenever it is parked during loading and unloading operations.

(12) Portable Tanks (Including Skid Tanks). When portable tanks are used in lieu of cargo tanks and are permanently mounted on tank motor vehicles for the transportation of ammonia, they shall comply with the requirements of WAC 296-24-51017. Where portable tanks, including those built to DOT Specification 51, 106A or 110A, are used for farm storage they shall comply with WAC 296-24-51011. When portable tanks are used as shipping containers in interstate commerce they shall comply with WAC 296-24-51015.

(13) Safety Equipment. (a) All tank trucks, trailers, and semi-trailers should be equipped with the following for emergency and rescue purposes:

(i) One full face gas mask with anhydrous ammonia refill canisters.

(ii) One pair of protective gloves made of rubber or other material impervious to ammonia.

(iii) Tight-fitting goggles or one full face shield.

(iv) A container of not less than five gallons of readily available clean water.

*An ammonia canister is effective for short periods of time in light concentrations of ammonia vapor, generally 15 minutes in concentrations of 3% and will not protect breathing in heavier concentrations. If ammonia vapors are detected when mask is applied the concentration is too high for safety. The life of a canister in service is controlled by the percentage of vapors to which it is exposed. Canisters must not be opened until ready for use and should be discarded after use. Unopened canisters may be guaranteed for as long as three years. All should be dated when received because of this limited life. In addition to this protection, an independently supplied air mask of the type used by fire departments may be used for severe emergencies.

[Order 76-6, § 296-24-51017, filed 3/1/76; Order 73-5, § 296-24-51017, filed 5/9/73 and Order 73-4, § 296-24-51017, filed 5/7/73.]

WAC 296-24-51019 Systems mounted on farm wagons (implements of husbandry) for the transportation of ammonia. This section applies to containers of 3000 gallons capacity or less and pertinent equipment mounted on farm wagons (implements of husbandry) and used for the transportation of ammonia. All Basic Rules of WAC 296-24-51009 apply to this section unless otherwise noted.

(1) Design of Containers. Containers shall be constructed in accordance with WAC 296-24-51009(2).

(2) Mounting Containers. (a) A suitable "stop" or "stops" shall be mounted on the farm wagon or on the container in such a way that the container shall not be dislodged from its mounting due to farm wagon coming to a sudden stop.

(b) A suitable "hold-down" device shall be provided which will anchor the container to the farm wagon at one or more places on each side of the container.

(c) When containers are mounted on four-wheel farm wagons, care shall be taken to insure that the weight is distributed evenly over both axles.

(d) When the cradle and the container are not welded together, suitable material shall be used between them to eliminate metal-to-metal friction.

(3) Container Appurtenances. (a) All containers shall be equipped with a fixed maximum liquid level gage.

(b) All containers with a capacity exceeding 250 gallons shall be equipped with a pressure gage having a dial graduated from 0-400 psi.

(c) The filling connection shall be fitted with combination back-pressure check valve and excess-flow valve; one double or two single back-pressure check valves; or a positive shut-off valve in conjunction with either an internal back-pressure check valve or an internal excess flow valve.

(d) All containers with a capacity exceeding 250 gallons shall be equipped for spray loading or with an approved vapor return valve.

(e) All vapor and liquid connections, except safety relief valves and those specifically exempt in WAC 296-24-51009(6)(e), shall be equipped with approved excess flow valves or may be fitted with quick-closing internal valves which, except during operating periods, shall remain closed.

(f) Fittings shall be protected from physical damage by means of a rigid guard designed to withstand static loading in any direction equal to twice the weight of the container and lading using a safety factor of four (4) based upon the ultimate strength of the material used. If the guard is fully enclosed, the safety relief valves shall be properly vented through the guard.

(g) If a liquid withdrawal line is installed in the bottom of a container, the connections thereto, including hose, shall not be lower than the lowest horizontal edge of the farm wagon axle.

(h) Both ends of the hose shall be made secure while in transit.

(4) Marking of Container. There shall appear on each side and on the rear end of the container in letters at least four inches high, the words "ANHYDROUS AMMONIA" or, "CAUTION—AMMONIA" or the container shall be marked in accordance with Department of Transportation Regulations.

(5) Farm Wagons (Implements of Husbandry). (a) Farm wagons (Implements of Husbandry) shall conform with State Regulations.

(b) All farm wagons shall be securely attached to the vehicle drawing them by means of drawbars supplemented by suitable safety chains.

(c) A farm wagon shall be constructed so that it will follow substantially in the path of the towing vehicle and will prevent the towed farm wagon from whipping or swerving dangerously from side to side.

(d) All farm wagons shall have five (5) gallons or more of readily available clean water. [Order 73-5, § 296-24-51019, filed 5/9/73 and Order 73-4, § 296-24-51019, filed 5/7/73.]

WAC 296-24-51021 Systems mounted on farm equipment (implements of husbandry) for the application of ammonia. This section applies to systems mounted on farm equipment and used for the field application of ammonia. All Basic Rules of WAC 296-24-51009 apply to this section unless otherwise noted.

(1) Design of Containers. The minimum design for containers shall be in accordance with WAC 296-24-51009(2).

(2) Mounting of Containers. All containers shall be securely mounted.

(3) Container Valves and Appurtenances. (a) Each container shall have a fixed maximum liquid-level gage.

(b) The filling connection shall be fitted with combination back-pressure check valve and excess-flow valve; one double or two single back-pressure check valves; or a positive shut-off valve in conjunction with either an internal back-pressure check valve or an internal excess-flow valve.

(c) An excess-flow valve is not required in the vapor connection, provided the controlling orifice is not in excess of seven sixteenths (7/16) of an inch in diameter and the valve is hand-operated (attached hand wheel or equivalent) shut-off valve. To assist in filling applicator tanks, it is permissible to bleed vapors to the open air, providing the preceding requirements are met.

(d) Metering devices may be connected directly to the tank withdrawal valve. A union type connection is permissible between the tank valve and metering device. Remote mounting of metering devices is permissible using hose which meets with specifications set out in Appendix B. When the applicator tank is trailed and the metering device is remotely mounted, such as on the tractor tool bar, an automatic break-a-way type, self-closing, coupling must be used.

(e) No excess-flow valve is required in the liquid withdrawal line provided the controlling orifice between the contents of the container and the outlet of the shut-off valve (see WAC 296-24-51009(6)(b)) does not exceed 7/16 inch in diameter.

APPENDIX A

Minimum required rate of discharge in cubic feet per minute of air at 120 percent of the maximum permitted start-to-discharge pressure for safety relief valves to be used on containers other than those constructed in accordance with United States Department of Transportation cylinder specifications.

Surface Area sq. ft.	Flow Rate CFM Air	Surface Area sq. ft.	Flow Rate CFM Air
20	258	400	3,010
25	310	450	3,320
30	360	500	3,620
35	408	550	3,910
40	455	600	4,200
45	501	650	4,480
50	547	700	4,760
55	591	750	5,040
60	635	800	5,300
65	678	850	5,590
70	720	900	5,850
75	762	950	6,120
80	804	1,000	6,380
85	845	1,050	6,640
90	885	1,100	6,900
95	925	1,150	7,160
100	965	1,200	7,410
105	1,010	1,250	7,660
110	1,050	1,300	7,910
115	1,090	1,350	8,160
120	1,120	1,400	8,410
125	1,160	1,450	8,650
130	1,200	1,500	8,900
135	1,240	1,550	9,140
140	1,280	1,600	9,380
145	1,310	1,650	9,620
150	1,350	1,700	9,860
155	1,390	1,750	10,090
160	1,420	1,800	10,330
165	1,460	1,850	10,560
170	1,500	1,900	10,800
175	1,530	1,950	11,030
180	1,570	2,000	11,260
185	1,600	2,050	11,490
190	1,640	2,100	11,720
195	1,670	2,150	11,950
200	1,710	2,200	12,180
210	1,780	2,250	12,400
220	1,850	2,300	12,630
230	1,920	2,350	12,850
240	1,980	2,400	13,080
250	2,050	2,450	13,300
260	2,120	2,500	13,520
270	2,180		
280	2,250		
290	2,320		
300	2,380		
310	2,450		
320	2,510		
330	2,570		
340	2,640		
350	2,700		
360	2,760		
370	2,830		
380	2,890		
390	2,950		

Surface Area = Total Outside Surface Area of Container in Square Feet. When the Surface Area is not stamped on the name plate or when the marking is not legible, the area can be calculated by using one of the following formulas:

- (1) Cylindrical container with hemispherical heads
Area = overall length in feet times outside diameter in feet times 3.1416.
- (2) Cylindrical container with other than hemispherical heads

Area = (overall length in feet plus 0.3 outside diameter in feet) times outside diameter in feet times 3.1416.

- (3) Spherical container
Area = outside diameter in feet squared times 3.1416.

Flow Rate — CFM Air = cubic feet per minute of air required at standard conditions, 60F and atmospheric pressure (14.7 psia).

The rate of discharge may be interpolated for intermediate values of surface area. For containers with total outside surface area greater than 2,500 sq. ft., the required flow rate can be calculated using the formula, Flow Rate CFM Air = 22.11 A^{0.82} where A = outside surface area of the container in square feet.

APPENDIX B

**TFI-RMA SPECIFICATION FOR ANHYDROUS AMMONIA HOSE
TFI-RMA STANDARD NO. M-5**

(1) **Scope.** This specification covers hose and hose assemblies commonly referred to as "pressure transfer hose", used to convey anhydrous ammonia liquid or to convey anhydrous ammonia gas where the gas is in contact with liquid ammonia. This specification primarily covers hose and hose assemblies which have a minimum burst pressure of 1750 psig, a safety factor of 5, and a maximum working pressure of 350 psig. These figures should not be misconstrued to mean that they are the maximum pressures to which anhydrous ammonia hose and hose assemblies are built, since higher pressure hose and hose assemblies are available for special applications.

(2) **Sizes and Tolerances.** Anhydrous ammonia hose shall be made with the following dimensions and tolerances:

RUBBER COVERED HOSE FOR USE WITH TWO-PIECE SCREW TYPE COUPLINGS

I.D.	Tolerance	O.D.	Tolerance
1/2"	± 1/32"	15/16"	± 1/32"
3/4"	± 1/32"	1 1/4"	± 1/32"
1 "	± 1/16"	1 1/2"	± 1/16"

NON-RUBBER COVERED AND RUBBER COVERED HOSE FOR USE WITH FULL FLOW COUPLINGS

I.D.	Tolerance	O.D.	Tolerance	Nominal Tubing O.D.
13/32"	+ .039" - .015"	49/64"	± .031"	1/2"
1/2"	+ .047" - .015"	59/64"	± .031"	5/8"
5/8"	+ .047" - .015"	1-5/64"	± .031"	3/4"
7/8"	+ .047" - .015"	1-15/64"	± .031"	1 "
1 1/8"	+ .062" - .015"	1 1/2"	± .047"	1 1/4"
1 3/8"	+ .062" - .015"	1 3/4"	± .047"	1 1/2"
1-13/16"	+ .062" - .015"	2-7/32"	± .047"	2 "

HOSE FOR USE WITH OTHER TYPES OF COUPLINGS*

I.D.	Tolerance
1/2"	± 1/32"
3/4"	± 1/32"
1 "	± 1/16"
1 1/4"	± 1/16"
1 1/2"	± 1/16"
2 "	± 1/16"

*The O.D. dimension and tolerance were intentionally omitted from this tabulation to provide for developments in both hose and couplings.

(3) **Construction.** (a) Inner Tube. The tube shall be uniform in quality and thickness and free from injurious defects. It shall meet the physical requirements of (4) of Appendix B. The material shall be resistant to hardening or other deterioration due to the action of ammonia.

(b) Reinforcement. The reinforcement shall consist of any material not adversely affected by permeating ammonia. The reinforcement shall be applied evenly and uniformly, and in such a way that it will meet the physical requirements of (4) of Appendix B. In constructions utilizing a ply or plies of wire reinforcement, the composition of the wire shall be a suitable corrosion resistant stainless steel.

(c) Cover. A rubber cover if used shall be uniform in quality and thickness and free from injurious defects. It shall meet the physical requirements of (4) of Appendix B. The cover shall be so compounded or constructed that it will not blister in service, and will be resistant to deterioration due to the action of ammonia. A gas tight cover shall be pricked to relieve pressure build-up between inner tube and cover. The cover shall be resistant to deterioration due to exposure to the elements.

(4) **Physical Tests.** (a) Tension Test of Tube and Cover.

	Tube	Cover
Tensile, psi. min.	800	1200
Elongation, percent, min.	150	200

(b) Adhesion Test

	Tube	Ply	Cover
Adhesion lbs./in.	10	8	10

(i) In constructions having braided wire or woven wire filler reinforcing members, only the cover adhesion requirement will apply, as it is impractical to prepare adhesion test specimens except for determining cover adhesion.

(c) Burst Test. All sizes have a minimum burst of 1750 psig. (See Scope.)

(d) Ammonia Performance Test. During the conditioning and flexing described in (7)(d) and (7)(d)(ii) of Appendix B there shall be no evidence of cover blistering or leakage. At the conclusion of the conditioning and at the conclusion of the flexing test, the burst must still meet the requirements of (4)(c) of Appendix B. There

shall be no evidence of separation of the component parts when the remainder of the samples are examined.

(e) **Low Temperatures Test.** The hose shall not fail at minus 40F plus or minus 2°, when tested as described in (7)(e) of Appendix B.

(5) **Types of Tests.** (a) **Acceptance Inspection.** This includes all the test specified, with the exception of the ammonia performance test.

(b) **Qualification Tests.** The qualification tests are intended to establish that the hose is properly designed and constructed to give satisfactory service life. These tests shall be conducted by a recognized independent laboratory. The qualification tests shall consist of all the tests specified herein including the ammonia performance test.

(6) **Method of Sampling.** (a) **Acceptance Inspection.** A 24-inch sample of each size and type hose, representative of the lot, shall be selected from each lot manufactured at one time, or from each 25,000 feet, whichever is smaller.

(b) **Qualification Test.** In addition to the samples specified in (6)(a) of Appendix B, two 12-foot lengths of each size hose shall be selected for the ammonia performance test. Each new hose shall be subjected to a qualification test, and again whenever there has been a design change.

(7) **Methods of Testing.** (a) **Tension Test of Tube and Rubber Cover.** The tension test shall be made in accordance with ASTM D-380.

(b) **Friction Test.** The friction test shall be made in accordance with ASTM D-380.

(c) **Burst Test.** The burst test shall be made in accordance with ASTM D-380 using the method entitled "Straight Bursting Test".

(d) **Ammonia Performance Test.** Two 12-foot lengths of hose, to be marked "A" and "B" shall be filled with liquid anhydrous ammonia by connecting to a tank and flushing out with ammonia to remove all the air. One end of each length shall be sealed and the other end left connected to the liquid space of a tank of anhydrous ammonia. The hose shall then be conditioned for 14 days at ambient temperature of 60 to 100F. A valve between the ammonia tank and the hose may be closed providing it is opened at least once each day to completely fill the hose with liquid anhydrous ammonia. The hose shall be examined each day for visible defects. There shall be no evidence of the cover blistering or perceptible leakage. If the hose is valved off at each end when liquid full, a hydrostatic relief valve should be provided between the block valves.

(i) **Conditioned Hose Burst Test.** A 24-inch sample cut from hose marked "A" shall be subjected to a straight hydrostatic bursting test in accordance with (7)(c) of Appendix B.

(ii) **Conditioned Hose Flexing Test.** (a) The 12-foot hose length marked "B" shall be installed in flexing test machine (Fig. 1). One end of the hose is to be connected to the traveling block and the free end passed around two pulleys with diameters as shown in Table 1. A 30-pound weight shall then be attached to the free end.

(b) From the remainder of hose length marked "A", (sizes 1 inch and under only), cut a section to length indicated in Table 1. Connect one end to the vertically traveling block as shown in Fig. 1 and connect the other end to the liquid space of a tank of anhydrous ammonia. Maintain the temperature of hose and ammonia between 70F and 90F. The test on the feeder hose does not apply to sizes over 1 inch. To conduct the flex test on the larger sizes any convenient hose may be used as a feeder hose.

(c) The flexing test shall continue for 72 hours at a rate of approximately 470 cycles per hour with a 42-inch vertical movement of the traveling block. A valve between the ammonia tank and the hose may be closed providing it is opened at least once each day to pressurize the hose. The hose shall be examined each day for visible defect. There shall be no evidence of cover blistering or leakage.

(d) At the conclusion of the flexing period, cut a 24-inch sample from hose "A" and from hose "B" and subject each sample to a straight burst test in accordance with (7)(c) of Appendix B. All samples shall have a minimum burst of 1750 psig.

TABLE 1

Hose Size	Pulley Diameter	Feeder Hose Length
1/2"	14" ± 1/4"	36"
3/4"	14" ± 1/4"	36"
1 "	14" ± 1/4"	36"
1 1/4"	15" ± 1/4"	
1 1/2"	18" ± 1/4"	
2 "	24" ± 1/4"	

(e) **Low Temperature Test.** A straight piece of hose at least 24 inches long, conditioned to minus 40F plus or minus 2F for 5 hours, and bent 180° within two seconds around a mandrel 12 times the nominal inside diameter of the hose, shall not break or show cracks in the tube or cover.

(8) **Retests and Rejections.** Any hose which fails in one or more tests may be resampled and retested, for which purpose two additional samples shall be selected from the hose for the test that failed to meet the requirements. Failure of either of the retested samples shall be cause for final rejection.

(9) **Hose Assemblies.** The couplings must be so designed and constructed, that an assembly shall have sufficient strength that it will reach the minimum burst pressure, as required by (4)(c) of Appendix B, before the end fittings leak or come off when pressure is applied as specified in ASTM D-380 for Hydrostatic Tests. Fittings must be resistant to the action of anhydrous and aqueous ammonia and in no case may assemblies be supplied with copper alloy fittings.

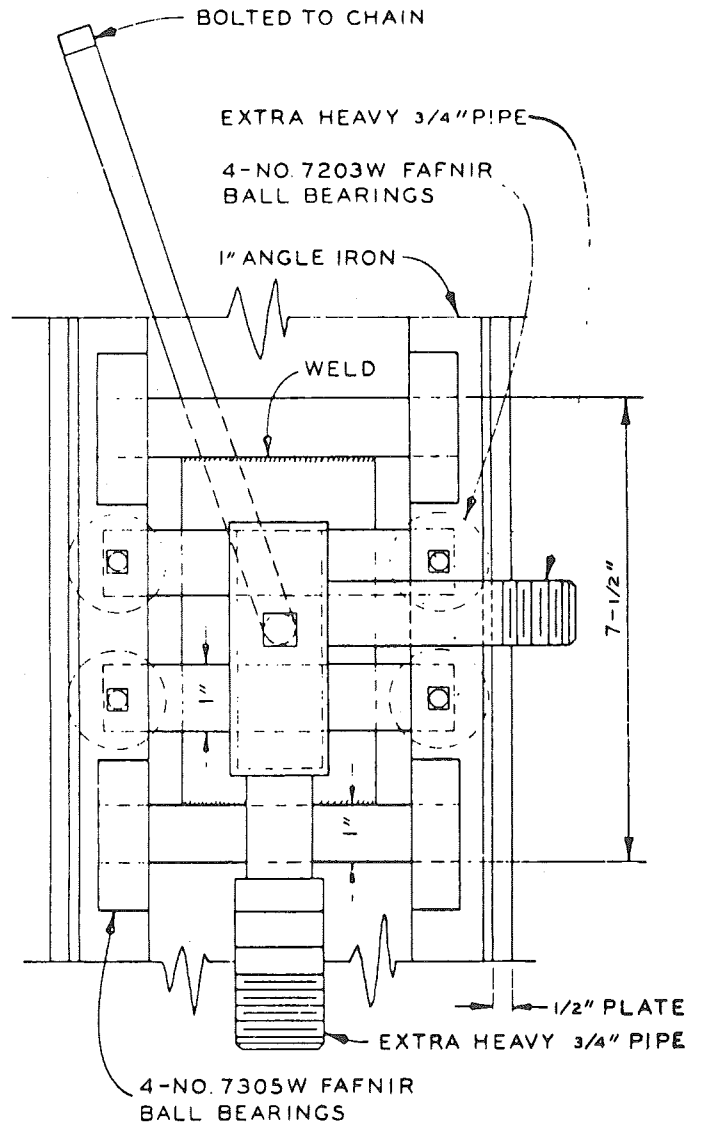
(10) **Markings.** Hose shall be clearly marked at least once every five feet with manufacturer's name or trademark, "Anhydrous Ammonia", the maximum working pressure in psig, year of manufacturer, and "TFI-RMA Spec.", for all hose manufactured after January 1, 1964.

As indicated in the Scope, the maximum working pressure must not be less than 350 psig.

(11) **Packaging** (a) **Packing.** Unless otherwise specified, hose shall be packed in substantial commercial containers of the type, size and kind commonly used for the purpose, so constructed as to insure acceptance and safe delivery to common or other carriers, at the lowest rate, to the point of delivery specified on the order.

(b) **Identification.** Unless otherwise specified, shipping containers shall be marked with the size and quantity of hose therein, the name of the manufacturer, and the number of the order.

FIGURE 1



NOTE: 1/2 H.P. electric motor-1750 RPM 20:1 gear reduction unit sprockets-14 teeth.

TROLLEY

American Society of Mechanical Engineers
(ASME)
345 East 47th Street
New York, New York 10017

American Society for Testing and Materials
(ASTM)
1916 Race Street
Philadelphia, Pennsylvania 19103

Bureau of Explosives*
1920 "L" Street, N.W.
Washington, D.C. 20036

Compressed Gas Association, Incorporated (CGA)
500 Fifth Avenue
New York, New York 10036

The Fertilizer Institute (TFI) (formerly Agricultural Nitrogen Institute—National Plant Food Institute)
1015 - 18th Street N.W.
Washington, D.C. 20036

Manufacturing Chemists' Association (MCA)
Universal Building
1825 Connecticut Ave., N.W.
Washington, D.C. 20009

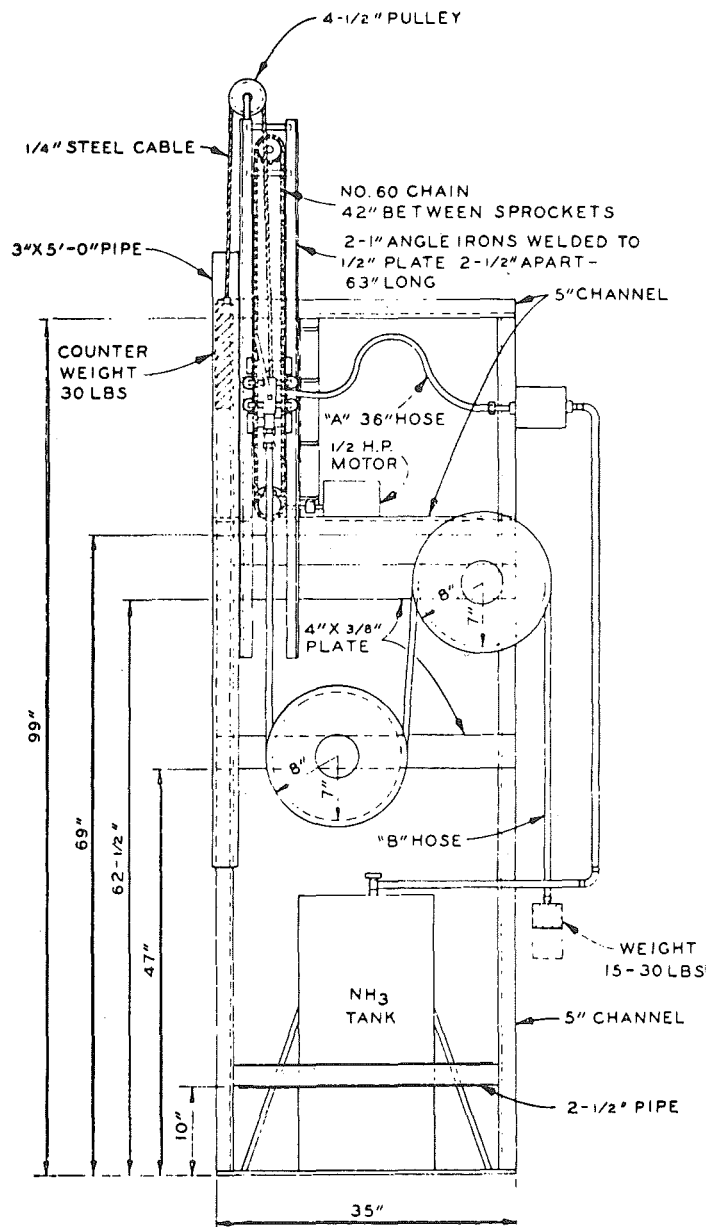
National Fire Protection Association (NFPA)
60 Batterymarch Street
Boston, Massachusetts 02110

Bureau of Mines U.S. Department of the Interior
4800 Forbes Avenue
Pittsburgh, Pennsylvania 15213

Superintendent of Documents*
U.S. Government Printing Office
Washington, D.C. 20402

*DOT Regulations available at nominal cost.

[Order 76-6, § 296-24-51017, filed 3/1/76.]



TYPICAL HOSE FLEXING MACHINE

[Order 73-5, § 296-24-51021, filed 5/9/73 and Order 73-4, § 296-24-51021, filed 5/7/73.]

WAC 296-24-51099 Appendix C--Availability of reference material.

APPENDIX C

AVAILABILITY OF REFERENCE MATERIAL

American National Standards Institute, Inc. (ANSI) [formerly United States of America Standards Institute (USASI) formerly American Standards Association (ASA)]

1430 Broadway
New York, New York 10018

American Petroleum Institute (API)
1801 "K" Street, N.W.
Washington, D.C. 20006

Part G

MEANS OF EGRESS, FIRE PROTECTION AND FIRE SUPPRESSION EQUIPMENT

WAC

- 296-24-550 Means of egress.
- 296-24-55001 Definitions.
- 296-24-55003 General requirements.
- 296-24-55005 Fundamental requirements.
- 296-24-55007 Protection of employees exposed by construction and repair operations.
- 296-24-55009 Maintenance.
- 296-24-565 Means of egress, general.
- 296-24-56501 Permissible exit components.
- 296-24-56503 Protective enclosure of exits.
- 296-24-56505 Width and capacity of means of egress.
- 296-24-56507 Egress capacity and occupant load.
- 296-24-56509 Arrangement of exits.
- 296-24-56511 Access to exits.
- 296-24-56513 Exterior ways of exit access.
- 296-24-56515 Discharge from exits.
- 296-24-56517 Headroom.
- 296-24-56519 Changes in elevation.
- 296-24-56521 Maintenance and workmanship.
- 296-24-56523 Furnishings and decorations.
- 296-24-56525 Automatic sprinkler systems.

296-24-56527	Alarm and fire detection systems.
296-24-56529	Fire retardant paints.
296-24-56531	Exit marking.
296-24-585	Fire protection.
296-24-58501	Definitions applicable to fire protection.
296-24-590	Portable fire suppression equipment—Portable fire extinguishers.
296-24-59001	General requirements.
296-24-59003	Selection of extinguishers.
296-24-59005	Distribution of portable fire extinguishers.
296-24-59007	Inspection, maintenance, and hydrostatic tests.
296-24-600	Standpipe and hose systems.
296-24-60001	General requirements.
296-24-60003	Hose outlets.
296-24-60005	Water supplies.
296-24-60007	Tests and maintenance.
296-24-605	Fixed fire suppression equipment—Automatic sprinkler systems.
296-24-60501	General requirements.
296-24-60503	Fire department connections.
296-24-60505	Sprinkler alarms.
296-24-60507	Maintenance of sprinkler system.
296-24-60509	Sprinkler head clearance.
296-24-615	Fixed dry chemical extinguishing systems.
296-24-61501	General requirements.
296-24-61503	Alarms and indicators.
296-24-61505	Inspection and maintenance.
296-24-620	Carbon dioxide extinguishing systems.
296-24-62001	General requirements.
296-24-62003	Inspection and maintenance.
296-24-625	Local fire alarm signaling systems.

WAC 296-24-550 Means of egress. [Order 73-5, § 296-24-550, filed 5/9/73 and Order 73-4, § 296-24-550, filed 5/7/73.]

WAC 296-24-55001 Definitions. (1) Means of Egress. A means of egress is a continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consists of three separate and distinct parts: the way of exit access, the exit, and the way of exit discharge. A means of egress comprises the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts, and yards.

(2) Exit access. Exit access is that portion of a means of egress which leads to an entrance to an exit.

(3) Exit. Exit is that portion of a means of egress which is separated from all other spaces of the building or structure by construction or equipment as required in these standards to provide a protected way of travel to the exit of discharge.

(4) Exit Discharge. Exit discharge is that portion of a means of egress between the termination of an exit and a public way.

(5) Low Hazard Contents. Low hazard contents shall be classified as those of such low combustibility that no self-propagating fire therein can occur and that consequently the only probable danger requiring the use of emergency exits will be from panic, fumes, or smoke, or fire from some external source.

(6) High-Hazard Contents. High-hazard contents shall be classified as those which are liable to burn with extreme rapidity or from which poisonous fumes or explosions are to be feared in the event of fire.

(7) Ordinary Hazard Contents. Ordinary hazard contents shall be classified as those which are liable to burn with moderate rapidity and to give off a considerable volume of smoke but from which neither poisonous fumes nor explosions are to be feared in case of fire.

(8) Approved. For the purposes of these standards approved shall mean listed or approved equipment by a nationally recognized testing laboratory. [Order 73-5, § 296-24-55001, filed 5/9/73 and Order 73-4, § 296-24-55001, filed 5/7/73.]

WAC 296-24-55003 General requirements. (1) Application. WAC 296-24-550 through WAC 296-24-55005 contain general fundamental requirements essential to providing a safe means of egress from fire and like emergencies. Nothing in these standards shall be construed to prohibit a better type of building construction, more exits, or otherwise safer conditions than the minimum requirements specified in these standards. Exits from vehicles, vessels, or other mobile structures are not covered by these standards. [Order 73-5, § 296-24-55003, filed 5/9/73 and Order 73-4, § 296-24-55003, filed 5/7/73.]

WAC 296-24-55005 Fundamental requirements. (1) Every building or structure, new or old, designed for human occupancy shall be provided with exits sufficient to permit the prompt escape of occupants in case of fire or other emergency. The design of exits and other safeguards shall be such that reliance for safety to life in case of fire or other emergency will not depend solely on any single safeguard; additional safeguards shall be provided for life safety in case any single safeguard is ineffective due to some human or mechanical failure.

(2) Every building or structure shall be so constructed, arranged, equipped, maintained, and operated as to avoid undue danger to the lives and safety of its occupants from fire, smoke, fumes, or resulting panic during the period of time reasonably necessary for escape from the building or structure in case of fire or other emergency.

(3) Every building or structure shall be provided with exits of kinds, numbers, location, and capacity appropriate to the individual building or structure, with due regard to the character of the occupancy, the number of persons exposed, the fire protection available, and the height and type of construction of the building or structure, to afford all occupants convenient facilities for escape.

(4) In every building or structure exits shall be so arranged and maintained as to provide free and unobstructed egress from all parts of the building or structure at all times when it is occupied. No lock or fastening to prevent free escape from the inside of any building shall be installed except in mental, penal, or corrective institutions where supervisory personnel are continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.

(5) Every exit shall be clearly visible or the route to reach it shall be conspicuously indicated in such a manner that every occupant of every building or structure who is physically and mentally capable will readily know

the direction of escape from any point, and each path of escape, in its entirety, shall be so arranged or marked that the way to a place of safety outside is unmistakable. Any doorway or passageway not constituting an exit or way to reach an exit, but of such a character as to be subject to being mistaken for an exit, shall be so arranged or marked as to minimize its possible confusion with an exit and the resultant danger of persons endeavoring to escape from fire finding themselves trapped in a dead-end space, such as a cellar or storeroom, from which there is no other way out.

(6) In every building or structure equipped for artificial illumination, adequate and reliable illumination shall be provided for all exit facilities.

(7) In every building or structure of such size, arrangement, or occupancy that a fire may not itself provide adequate warning to occupants, fire alarm facilities shall be provided where necessary to warn occupants of the existence of fire so that they may escape, or to facilitate the orderly conduct of fire exit drills.

(8) Every building or structure, section, or area thereof of such size, occupancy, and arrangement that the reasonable safety of numbers of occupants may be endangered by the blocking of any single means of egress due to fire or smoke, shall have at least two means of egress remote from each other, so arranged as to minimize any possibility that both may be blocked by any one fire or other emergency conditions.

(9) Compliance with WAC 296-24-550 through WAC 296-24-55005 shall not be construed as eliminating or reducing the necessity for other provisions for safety of persons using a structure under normal occupancy conditions, nor shall any provision of these standards be construed as requiring or permitting any condition that may be hazardous under normal occupancy conditions.

(10) Freezer rooms or refrigerated rooms. The opening device on all doors of walk-in refrigerated or freezer rooms must be the type, when locked from the outside with a lock, can be opened from inside. [Order 74-27, § 296-24-55005, filed 5/7/74; Order 73-5, § 296-24-55005, filed 5/9/73 and Order 73-4, § 296-24-55005, filed 5/7/73.]

WAC 296-24-55007 Protection of employees exposed by construction and repair operations. (1) No building or structure under construction shall be occupied in whole or in part until all exit facilities required for the part occupied are completed and ready for use.

(2) No existing building shall be occupied during repairs or alterations unless all existing exits and any existing fire protection are continuously maintained, or in lieu thereof other measures are taken which provide equivalent safety.

(3) No flammable or explosive substances or equipment for repairs or alterations shall be introduced in a building of normally low or ordinary hazard classification while the building is occupied, unless the condition of use and safeguards provided are such as not to create any additional danger or handicap to egress beyond the

normally permissible conditions in the building. [Order 73-5, § 296-24-55007, filed 5/9/73 and Order 73-4, § 296-24-55007, filed 5/7/73.]

WAC 296-24-55009 Maintenance. (1) Every required exit, way of approach thereto, and way of travel from the exit into the street or open space, shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

(2) Every automatic sprinkler system, fire detection and alarm system, exit lighting, fire door, and other item of equipment, where provided, shall be continuously in proper operating condition. [Order 73-5, § 296-24-55009, filed 5/9/73 and Order 73-4, § 296-24-55009, filed 5/7/73.]

WAC 296-24-565 Means of egress, general. [Order 73-5, § 296-24-565, filed 5/9/73 and Order 73-4, § 296-24-565, filed 5/7/73.]

WAC 296-24-56501 Permissible exit components. An exit shall consist only of the approved components. Exit components shall be constructed as an integral part of the building or shall be permanently affixed thereto. [Order 73-5, § 296-24-56501, filed 5/9/73 and Order 73-4, § 296-24-56501, filed 5/7/73.]

WAC 296-24-56503 Protective enclosure of exits. When an exit is protected by separation from other parts of the building the separating construction shall meet the following requirements.

(1) The separation shall have at least a 1-hour fire resistance rating when the exit connects three stories or less. This applies whether the stories connected are above or below the story at which exit discharge begins.

(2) The separation shall have at least a 2-hour fire resistance rating when the exit connects four or more stories, whether above or below the floor of discharge. It shall be constructed of noncombustible materials, and shall be supported by construction having at least a 2-hour fire resistance rating.

(3) Any opening therein shall be protected by an approved self-closing fire door.

(4) Openings in exit enclosures shall be confined to those necessary for access to the enclosure from normally occupied spaces and for egress from the enclosure. [Order 73-5, § 296-24-56503, filed 5/9/73 and Order 73-4, § 296-24-56503, filed 5/7/73.]

WAC 296-24-56505 Width and capacity of means of egress. (1) The capacity in number of persons per unit of exit width for approved components of means of egress shall be as follows:

(a) Level Egress Components (including Class A Ramps) 100 persons.

(b) Inclined Egress Components (including Class B Ramps) 60 persons.

(c) A ramp shall be designated as Class A or Class B in accordance with the following Table E-1:

TABLE E-1

	Class A	Class B
Width	44 inches and greater.	30 to 44 inches.
Slope	1 to 1 3/16 inches in 12 inches	1 3/16 to 2 inches in 12 inches.
Maximum height between landings	No limit.	12 feet.

(2) Means of egress shall be measured in units of exit width of 22 inches. Fractions of a unit shall not be counted, except that 12 inches added to one or more full units shall be counted as one-half a unit of exit width.

(3) Units of exit width shall be measured in the clear at the narrowest point of the means of egress except that a handrail may project inside the measured width on each side not more than 5 inches and a stringer may project inside the measured width not more than 1 1/2 inches. An exit or exit access door swinging into an aisle or passageway shall not restrict the effective width thereof at any point during its swing to less than the minimum widths hereafter specified. [Order 73-5, § 296-24-56505, filed 5/9/73 and Order 73-4, § 296-24-56505, filed 5/7/73.]

WAC 296-24-56507 Egress capacity and occupant load. (1) The capacity of means of egress for any floor, balcony, tier, or other occupied space shall be sufficient for the occupant load thereof. The occupant load shall be the maximum number of persons that may be in the space at any time.

(2) Where exits serve more than one floor, only the occupant load of each floor considered individually need be used in computing the capacity of the exits at that floor, provided that exit capacity shall not be decreased in the direction of exit travel. [Order 73-5, § 296-24-56507, filed 5/9/73 and Order 73-4, § 296-24-56507, filed 5/7/73.]

WAC 296-24-56509 Arrangement of exits. When more than one exit is required from a story, at least two of the exits shall be remote from each other and so arranged as to minimize any possibility that both may be blocked by any one fire or other emergency condition. [Order 73-5, § 296-24-56509, filed 5/9/73 and Order 73-4, § 296-24-56509, filed 5/7/73.]

WAC 296-24-56511 Access to exits. (1) Exits shall be so located and exit access shall be so arranged that exits are readily accessible at all times. Where exits are not immediately accessible from an open floor area, safe and continuous passageways, aisles, or corridors leading directly to every exit and so arranged as to provide convenient access for each occupant to at least two exits by separate ways of travel, except as a single exit or limited dead ends are permitted by other provisions of these standards shall be maintained.

(2) A door from a room to an exit or to a way of exit access shall be of the side-hinged, swinging type. It shall swing with exit travel when the room is occupied by more than 50 persons or used for a high hazard occupancy.

(3) In no case shall access to an exit be through a bathroom, or other room subject to locking, except where the exit is required to service only the room subject to locking.

(4) Ways of exit access and the doors to exits to which they lead shall be so designed and arranged as to be clearly recognizable as such. Hangings or draperies shall not be placed over exit doors or otherwise so located as to conceal or obscure any exit. Mirrors shall not be placed on exit doors. Mirrors shall not be placed in or adjacent to any exit in such a manner as to confuse the direction of exit.

(5) Exit access shall be so arranged that it will not be necessary to travel toward any area of high hazard occupancy in order to reach the nearest exit, unless the path of travel is effectively shielded from the high hazard location by suitable partitions or other physical barriers.

(6) The minimum width of any way of exit access shall in no case be less than 28 inches. Where a single way of exit access leads to an exit, its capacity in terms of width shall be at least equal to the required capacity of the exit to which it leads. Where more than one way of exit access leads to an exit, each shall have a width adequate for the number of persons it must accommodate. [Order 73-5, § 296-24-56511, filed 5/9/73 and Order 73-4, § 296-24-56511, filed 5/7/73.]

WAC 296-24-56513 Exterior ways of exit access.

(1) Access to an exit may be by means of any exterior balcony, porch, gallery, or roof that conforms to the requirements of this section.

(2) Exterior ways of exit access shall have smooth, solid floors, substantially level, and shall have guards on the unenclosed sides.

(3) Where accumulation of snow or ice is likely because of the climate, the exterior way of exit access shall be protected by a roof, unless it serves as the sole normal means of access to the rooms or spaces served, in which case it may be assumed that snow and ice will be regularly removed in the course of normal occupancy.

(4) A permanent, reasonably straight path of travel shall be maintained over the required exterior way of exit access. There shall be no obstruction by railings, barriers, or gates that divide the open space into sections appurtenant to individual rooms, apartments, or other uses. Where the Director or his duly authorized representative finds the required path of travel to be obstructed by furniture or other movable objects, he may require that they be fastened out of the way or he may require that railings or other permanent barriers be installed to protect the path of travel against encroachment.

(5) An exterior way of exit access shall be so arranged that there are no dead ends in excess of 20 feet. Any unenclosed exit served by an exterior way of exit access shall be so located that no part of the exit extends past a

vertical plane 20 feet and one-half the required width of the exit from the end of and at right angles to the way of exit access.

(6) Any gallery, balcony, bridge, porch or other exterior exit access that projects beyond the outside wall of the building shall comply with the requirements of this section as to width and arrangement. [Order 73-5, § 296-24-56513, filed 5/9/73 and Order 73-4, § 296-24-56513, filed 5/7/73.]

WAC 296-24-56515 Discharge from exits. (1) All exits shall discharge directly to the street, or to a yard, court, or other open space that gives safe access to a public way. The streets to which the exits discharge shall be of width adequate to accommodate all persons leaving the building. Yards, courts, or other open spaces to which exits discharge shall also be of adequate width and size to provide all persons leaving the building with ready access to the street.

(2) Stairs and other exits shall be so arranged as to make clear the direction of egress to the street. Exit stairs that continue beyond the floor of discharge shall be interrupted at the floor of discharge by partitions, doors, or other effective means.

(3) Where a doorway or corner of a building is located near a railroad or trolley track so that a workman is liable to walk upon the track in front of an approaching engine or cars a standard safeguard shall be installed with a warning sign. [Order 73-5, § 296-24-56515, filed 5/9/73 and Order 73-4, § 296-24-56515, filed 5/7/73.]

WAC 296-24-56517 Headroom. Means of egress shall be so designed and maintained as to provide adequate headroom, but in no case shall the ceiling height be less than 7 feet 6 inches nor any projection from the ceiling be less than 6 feet 8 inches from the floor. [Order 73-5, § 296-24-56517, filed 5/9/73 and Order 73-4, § 296-24-56517, filed 5/7/73.]

WAC 296-24-56519 Changes in elevation. Where a means of egress is not substantially level, such differences in elevation shall be negotiated by stairs or ramps. [Order 73-5, § 296-24-56519, filed 5/9/73 and Order 73-4, § 296-24-56519, filed 5/7/73.]

WAC 296-24-56521 Maintenance and workmanship. (1) Doors, stairs, ramps, passages, signs, and all other components of means of egress shall be of substantial, reliable construction and shall be built or installed in a workmanlike manner.

(2) Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

(3) Any device or alarm installed to restrict the improper use of an exit shall be so designed and installed that it cannot, even in cases of failure, impede or prevent emergency use of such exit. [Order 73-5, § 296-24-56521, filed 5/9/73 and Order 73-4, § 296-24-56521, filed 5/7/73.]

WAC 296-24-56523 Furnishings and decorations. (1) No furnishings, decorations, or other objects shall be so placed as to obstruct exits, access thereto, egress therefrom, or visibility thereof.

(2) No furnishings or decorations of an explosive or highly flammable character shall be used in any occupancy. [Order 73-5, § 296-24-56523, filed 5/9/73 and Order 73-4, § 296-24-56523, filed 5/7/73.]

WAC 296-24-56525 Automatic sprinkler systems. All automatic sprinkler systems shall be continuously maintained in reliable operating condition at all times, and such periodic inspections and tests shall be made as are necessary to assure proper maintenance. [Order 73-5, § 296-24-56525, filed 5/9/73 and Order 73-4, § 296-24-56525, filed 5/7/73.]

WAC 296-24-56527 Alarm and fire detection systems. (1) Systems shall be under the supervision of a responsible person who shall cause proper tests to be made at weekly intervals and have general charge of all alterations and additions.

(2) Fire alarm signaling equipment shall be restored to service as promptly as possible after each test or alarm, and shall be kept in normal condition for operation. Equipment requiring rewinding or replenishing shall be rewound or replenished as promptly as possible after each test or alarm. [Order 73-5, § 296-24-56527, filed 5/9/73 and Order 73-4, § 296-24-56527, filed 5/7/73.]

WAC 296-24-56529 Fire retardant paints. Fire retardant paints or solutions shall be renewed at such intervals as necessary to maintain the necessary flame retardant properties. [Order 73-5, § 296-24-56529, filed 5/9/73 and Order 73-4, § 296-24-56529, filed 5/7/73.]

WAC 296-24-56531 Exit marking. (1) Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupants.

(2) Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is so located or arranged as to be likely to be mistaken for an exit, shall be identified by a sign reading "Not an Exit" or similar designation, or shall be identified by a sign indicating its actual character, such as "To Basement," "Storeroom," "Linen Closet," or the like.

(3) Every required sign designating an exit or way of exit access shall be so located and of such size, color, and design as to be readily visible. No decorations, furnishings, or equipment which impair visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision to the required exit sign of such a character as to so detract attention from the exit sign that it may not be noticed.

(4) Every exit sign shall be distinctive in color and shall provide contrast with decorations, interior finish, or other signs.

(5) A sign reading "Exit", or similar designation, with an arrow indicating the direction, shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

(6) Every exit sign shall be suitably illuminated by a reliable light source giving a value of not less than 5-foot candles on the illuminated surface. Artificial lights giving illumination to exit signs other than the internally illuminated types shall have screens, discs, or lenses of not less than 25 square inches area made of translucent material to show red or other specified designating color on the side of the approach.

(7) Each internally illuminated exit sign shall be provided in all occupancies where reduction of normal illumination is permitted.

(8) 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. [Order 73-5, § 296-24-56531, filed 5/9/73 and Order 73-4, § 296-24-56531, filed 5/7/73.]

WAC 296-24-585 Fire protection. [Order 73-5, § 296-24-585, filed 5/9/73 and Order 73-4, § 296-24-585, filed 5/7/73.]

WAC 296-24-58501 Definitions applicable to fire protection. (1) "Class A fires" are fires in ordinary combustible materials, such as wood, cloth, paper, and rubber.

(2) "Class B fires" are fires in flammable liquids, gases, and greases.

(3) "Class C fires" are fires which involve energized electrical equipment where the electrical nonconductivity of the extinguishing media is of importance. (When electrical equipment is deenergized, extinguisher for Class A or B fires may be used safely.)

(4) "Class D fires" are fires in combustible metals, such as magnesium, titanium, zirconium, sodium, and potassium.

(5) Classification of portable fire extinguishers: "Portable fire extinguishers" are classified for use on certain classes of fires and rated for relative extinguishing effectiveness at a temperature of plus 70°F. by nationally recognized testing laboratories. This is based upon the preceding classification of fires and the fire extinguishment potentials as determined by fire tests.

NOTE: The classification and rating system described in this section is that used by Underwriters' Laboratories, Inc. and Underwriters' Laboratories of Canada and is based on extinguishing preplanned fires of determined size and description as follows:

(a) Class A rating—Wood and excelsior fires excluding deep-seated conditions.

(b) Class B rating—Two-inch depth gasoline fires in square pans.

(c) Class C rating—No fire test. Agent must be a nonconductor of electricity.

(d) Class D rating—Special tests on specific combustible metal fires.

(6) A "light hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of small size may be expected. These may include offices, schoolrooms, churches, assembly halls, telephone exchanges, etc.

(7) An "ordinary hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of moderate size may be expected. These may include mercantile storage and display, auto showrooms, parking garages, light manufacturing, warehouses not classified as extra hazard, school shop areas, etc.

(8) An "extra hazard" is a situation where the amount of combustibles or flammable liquids present is such that fires of severe magnitude may be expected. These may include woodworking, auto repair, aircraft servicing, warehouses with high-piled (14 feet or higher) combustibles, and processes such as flammable liquid handling, painting, dipping, etc.

(9) Sprinkler system: A "sprinkler system," for fire protection purposes, is an integrated system of underground and overhead piping designed in accordance with fire protection engineering standards. The system includes a suitable water supply, such as a gravity tank, fire pump, reservoir, or pressure tank and/or connection by underground piping to a city main. The portion of the sprinkler system above ground is a network of specially sized or hydraulically designed piping installed in a building, structure or area, generally overhead, and to which sprinklers are connected in a systematic pattern. The system includes a controlling valve and a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

NOTE: The design and installation of water supply facilities such as gravity tanks, fire pumps, reservoirs, or pressure tanks, and underground piping are covered by NFPA Standards No. 22-1970, Water Tanks For Private Fire Protection; No. 20-1970, Installation of Centrifugal Fire Pumps and No. 24-1970, Outside Protection.

(10) Sprinkler alarms: A "sprinkler alarm" unit is an assembly of apparatus approved for the service and so constructed and installed that any flow of water from a sprinkler system equal to or greater than that from a single automatic sprinkler will result in an audible alarm signal on the premises.

(11) Class of service—standpipe systems: "Standpipe systems" are grouped into three general classes of service for the intended use in the extinguishment of fire.

(a) Class I: For use by fire departments and those trained in handling heavy fire streams (2 1/2-inch hose).

(b) Class II: For use primarily by the building occupants until the arrival of the fire department (small hose).

(c) Class III: For use by either fire departments and those trained in handling heavy hose streams or by the building occupants.

(12) Class I service: "Class I service" is a standpipe system capable of furnishing the effective fire streams

required during the more advanced stages of fire on the inside of buildings or for exposure fire.

(13) Class II service: "Class II service" is a standpipe system which affords a ready means for the control of incipient fires by the occupants of buildings during working hours and by watchmen and those present during the night time and holidays.

(14) Class III service: "Class III service" is a standpipe system capable of furnishing the effective fire streams required during the more advanced stages of fire on the inside of buildings as well as providing a ready means for the control of fires by the occupants of the building.

(15) Standpipe system: "Standpipe systems" are usually of the following types: (a) A wet standpipe system having a supply valve open and water pressure maintained at all times.

(b) A standpipe system so arranged through the use of approved devices as to admit water to the system automatically by opening a hose valve.

(c) A standpipe system arranged to admit water to the system through manual operation of approved remote control devices located at each hose station.

(d) Dry standpipe having no permanent water supply. See also (11) of this section.

(16) Type I storage: "Type I storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored over 15 feet but not more than 21 feet high in solid piles or over 12 feet but not more than 21 feet high in piles that contain horizontal channels. Minor quantities of commodities of hazard greater than ordinary combustibles may be included without affecting this general classification.

(17) Type II storage: "Type II storage" is that in which combustible commodities or noncombustible commodities involving combustible packaging or storage aids are stored not over 15 feet high in solid piles or not over 12 feet high in piles that contain horizontal channels. Minor quantities of commodities of hazard greater than ordinary combustibles may be included without affecting this general classification.

(18) Type III storage: "Type III storage" is that in which the stored commodities, packaging, and storage aids are noncombustible or contain only a small concentration of combustibles which are incapable of producing a fire that would cause appreciable damage to the commodities stored or to noncombustible wall, floor or roof construction. Ordinary combustible commodities in completely sealed noncombustible containers may qualify in this classification. General commodity storage that is subject to frequent changing and storage of combustible packaging and storage aids is excluded from this category.

(19) Approved: "Approved" means listed or approved by: (a) At least one of the following nationally recognized testing laboratories: Factory Mutual Engineering Corp.; Underwriters' Laboratories, Inc., or (b) Federal agencies such as Bureau of Mines, Department of the Interior; Department of Transportation; or U.S. Coast Guard, which issue approvals for such equipment. [Order 74-27, § 296-24-58501, filed 5/7/74; Order 73-5, §

296-24-58501, filed 5/9/73 and Order 73-4, § 296-24-58501, filed 5/7/73.]

WAC 296-24-590 Portable fire suppression equipment—Portable fire extinguishers. [Order 73-5, § 296-24-590, filed 5/9/73 and Order 73-4, § 296-24-590, filed 5/7/73.]

WAC 296-24-59001 General requirements. (1) Operable Condition. Portable extinguishers shall be maintained in a fully charged and operable condition, and kept in their designated places at all times when they are not being used.

(2) Location. Extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. They shall be located along normal paths of travel.

(3) Marking of Location. Extinguishers shall not be obstructed or obscured from view. In large rooms, and in certain locations where visual obstruction cannot be completely avoided, means shall be provided to indicate the location and intended use of extinguishers conspicuously.

(4) Marking of Extinguishers. If extinguishers intended for different classes of fire are grouped, their intended use shall be marked conspicuously to insure choice of the proper extinguisher at the time of a fire.

(5) Mounting of Extinguishers. Extinguishers shall be installed on the hangers or in the brackets supplied, mounted in cabinets, or set on shelves unless the extinguishers are of the wheeled type.

(6) Height of Mounting. Extinguishers having a gross weight not exceeding 40 pounds shall be installed so that the top of the extinguisher is not more than 5 feet above the floor. Extinguishers having a gross weight greater than 40 pounds (except wheeled types) shall be so installed that the top of the extinguisher is not more than 3 1/2 feet above the floor.

(7) Cabinet Mounting. Extinguisher mounted in cabinets or wall recesses or set on shelves shall be placed in a manner such that the extinguisher operating instructions face outward. The location of such extinguishers shall be marked conspicuously.

(8) Vibrating Location. Extinguishers installed under conditions where they are subject to severe vibration shall be installed in brackets specifically designed to withstand the impact of vibration and to prevent the extinguisher from becoming dislodged.

(9) Temperature Range. Extinguishers shall be suitable for use within a temperature range of at least plus 40° to 120° Fahrenheit.

(10) Extreme Temperature Exposure. When extinguishers are installed in locations subjected to temperatures outside the range prescribed in WAC 296-24-59001(9), they shall be of a type approved or listed for the temperature to which they will be exposed, or placed in an enclosure capable of maintaining the temperature within the range prescribed in WAC 296-24-59001(9). [Order 73-5, § 296-24-59001, filed 5/9/73 and Order 73-4, § 296-24-59001, filed 5/7/73.]

WAC 296-24-59003 Selection of extinguishers. (1) General. The selection of extinguishers for a given situation will depend upon the character of the fires anticipated, the construction and occupancy of the individual property, the vehicle or hazard to be protected, ambient-temperature conditions, and other factors. The number of extinguishers required shall be determined by reference to WAC 296-24-59005. Approved fire extinguishers shall be used to meet the requirements of this section.

(2) Selection by Hazard.

(a) Extinguishers shall be selected for the specific classes of hazards to be protected in accordance with the following sections.

(b) Extinguishers for protecting Class A hazards shall be selected from among the following: foam, loaded stream, multipurpose dry chemical, and water types. Certain smaller extinguishers which are charged with multipurpose dry chemical are rated on Class B and Class C fires, but have insufficient effectiveness to earn the minimum 1-A rating even though they have value in extinguishing smaller Class A fires.

Such smaller extinguishers shall not be used to meet the requirements of WAC 296-24-59005(2)(a).

(c) Extinguishers for protection of Class B hazards shall be selected from the following: Bromotrifluoromethane, carbon dioxide, dry chemical, foam, loaded stream, and multipurpose dry chemical. Extinguishers with ratings less than 1-B shall not be considered in determining suitability.

(d) Extinguishers for protection of Class C hazards shall be selected from the following: Bromotrifluoromethane, carbon dioxide, dry chemical, and multipurpose dry chemical.

NOTE: Carbon dioxide extinguishers equipped with metal horns are not considered safe for use on fires in energized electrical equipment, and therefore, are not classified for use on Class C hazards.

(e) Extinguishers and extinguishing agents for the protection of Class D hazards shall be of types approved for use on the specific combustible-metal hazard. [Order 74-27, § 296-24-59003, filed 5/7/74; Order 73-5, § 296-24-59003, filed 5/9/73 and Order 73-4, § 296-24-59003, filed 5/7/73.]

WAC 296-24-59005 Distribution of portable fire extinguishers. (1) General. (a) The number of fire extinguishers needed to protect a property shall be determined as prescribed herein, considering the area and arrangement of the building or occupancy, the severity of the hazard, the anticipated classes of fires, and the distances to be traveled to reach extinguishers.

(b) Fire extinguishers shall be provided for the protection of both the building structure, if combustible, and the occupancy hazards contained therein.

(c) Required building protection shall be provided by fire extinguishers suitable for Class A fires.

(d) Occupancy hazard protection shall be provided by fire extinguishers suitable for such Class A, B, C, or D fire potentials as may be present.

(e) Extinguishers provided for building protection may be considered also for the protection of occupancies having a Class A fire potential.

(f) Combustible buildings having an occupancy hazard subject to Class B, and/or Class C fires, shall have a standard complement of Class A fire extinguishers as required by Table L-1 for building protection, plus additional Class B and/or Class C extinguishers. Where fire extinguishers have more than one letter classification (such as 2-A; 20-B;C), they may be considered to satisfy the requirements of each letter class.

(g) Rooms or areas shall be graded generally as light hazard, ordinary hazard, or extra hazard. Limited areas of greater or lesser hazard shall be protected as required.

(2) Fire Extinguisher Size and Placement for Class A Hazards. (a) Minimal sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-1. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-1.

TABLE L-1

Basic minimum extinguisher rating for area specified	Maximum travel distances to extinguishers (feet)	Areas to be protected per extinguisher		
		Light hazard occupancy (square feet)	Ordinary hazard occupancy (square feet)	Extra hazard occupancy (square feet)
1A.....	75	3,000	Note 1	Note 1
2A.....	75	6,000	3,000	Note 1
3A.....	75	9,000	4,500	3,000
4A.....	75	11,250	6,000	4,000
6A.....	75	11,250	9,000	6,000

NOTE 1: Not permitted except as specified in (2)(b) of this section.

(b) The protection requirements specified in Table L-1 may be fulfilled by several extinguishers of lower ratings for ordinary or extrahazard occupancies.

(c) Where the floor area of a building is less than that specified in Table L-1, at least one extinguisher of the minimum size recommended shall be provided.

(d) The protection requirements may be fulfilled with extinguishers of higher rating provided the travel distance to such larger extinguishers shall not exceed 75 feet.

(3) Fire Extinguisher Size and Placement for Class B Fires Other Than for Fires in Flammable Liquids of Appreciable Depth.

(a) Minimal sizes of fire extinguishers for the listed grades of hazard shall be provided on the basis of Table L-2. Extinguishers shall be located so that the maximum travel distances shall not exceed those specified in Table L-2.

TABLE L-2

Type of Hazard	Basic minimum extinguisher rating	Maximum travel distance to extinguishers (feet)
Light	4B	50
Ordinary	8B	50
Extra	12B	50

NOTE: Where this section calls for minimum extinguisher ratings of 4-B, 8-B, or 12-B, the requirements may be met by existing extinguishers of multiple foam extinguishers as allowed by (3)(b) of this section. However, if a single extinguisher must be purchased to fulfill such requirements, the next higher rating shall be used.

(b) Two or more extinguishers of lower rating, except for foam extinguishers, shall not be used to fulfill the protection requirements of Table L-2. Up to three foam extinguishers may be used to fulfill these requirements.

(c) The protection requirements may be fulfilled with extinguishers of higher ratings provided the travel distance to such larger extinguishers shall not exceed 50 feet.

(4) Fire Extinguisher Size and Placement for Class B Fires in Flammable Liquids of Appreciable Depth. (a) For flammable liquid hazards of appreciable depth (Class B), such as in dip or quench tanks, Class B fire extinguishers shall be provided on the basis of one numerical unit of Class B extinguishing potential per square foot of flammable liquid surface of the largest tank hazard within the area.

NOTE: Appreciable depth is defined as a depth of a liquid greater than one-quarter inch.

(b) Two or more extinguishers of lower ratings except for foam extinguishers, shall not be used in lieu of the extinguisher required for the largest tank. Up to three foam extinguishers may be used to fulfill these requirements.

(c) Scattered or widely separated hazards shall be individually protected if the specified travel distances in (3)(a) and (b) of this section are exceeded. Likewise, extinguishers in the proximity of a hazard shall be carefully located so as to be accessible in the presence of a fire without undue danger to the operator.

(5) Fire Extinguisher Size and Placement for Class C Hazards. (a) Extinguishers with Class C ratings shall be required where energized electrical equipment may be encountered which would require a nonconducting extinguishing media. This will include fire either directly involving or surrounding electrical equipment. Since the fire itself is a Class A or Class B hazard the extinguishers are sized and located on the basis of the anticipated Class A or B hazard. [Order 73-5, § 296-24-59005, filed 5/9/73 and Order 73-4, § 296-24-59005, filed 5/7/73.]

WAC 296-24-59007 Inspection, maintenance, and hydrostatic tests. (1) General. (a) The owner or occupant of a property in which extinguishers are located shall be responsible for such inspection, maintenance, and testing.

NOTE: For details of conducting needed inspections, proper maintenance operations, and required test, see NFPA No. 10A-1970, Maintenance and Use of Portable Fire Extinguishers.

(2) Inspection. (a) Extinguishers shall be inspected monthly, or at more frequent intervals when circumstances require, to insure they are in their designated places, to insure they have not been actuated or tampered with, and to detect any obvious physical damage, corrosion, or other impairments.

(b) Any extinguishers showing defects shall be given a complete maintenance check.

(3) Maintenance. (a) At regular intervals, not more than 1 year apart, or when specifically indicated by an inspection, extinguishers shall be thoroughly examined and/or recharged or repaired to insure operability and safety; or replaced as needed.

(b) Extinguishers removed from the premises to be recharged shall be replaced by spare extinguishers during the period they are gone.

(c) Pails or drums of powder-extinguishing agents for scoop or shovel application to metal fires shall be kept full at all times.

(d) Each extinguisher shall have a durable tag securely attached to show the maintenance or recharge date and the initials or signature of the person who performs this service.

(4) Hydrostatic Tests. (a) If, at any time, an extinguisher shows evidence of corrosion or mechanical injury, it shall be subjected to a hydrostatic pressure test, or replaced.

(b) For evaluating the condition of extinguisher cylinders made to Department of Transportation specifications (cf.49 CFR Chapter I), see the Standard for Visual Inspection of Compressed Gas Cylinders (CGA C-6), published by the Compressed Gas Association, 500 Fifth Avenue, New York, N.Y. 10036.

(c) At intervals not exceeding those specified in Table L-3 and WAC 296-24-59007(4)(d), extinguishers shall be hydrostatically tested. The first hydrostatic retest may be conducted between the fifth and sixth years for those with a designated test interval of 5 years.

TABLE L-3
HYDROSTATIC TEST INTERVAL
FOR EXTINGUISHERS

Extinguisher Type:	Test interval year
Soda-acid	5
Cartridge-operated water and/or anti-freeze	5
Storage-pressure water and/or anti-freeze	5
Wetting agent	5

TABLE L-3
HYDROSTATIC TEST INTERVAL
FOR EXTINGUISHERS

Extinguisher Type:	Test interval year
Foam.....	5
Loaded stream.....	5
Dry chemical extinguishers with stainless steel shells, or soldered-brass shells.....	5
Carbon dioxide extinguishers	5
Dry chemical extinguishers with brazed-Brass shells, or mild-steel shell, or aluminum shells.....	12
Bromotrifluoromethane.....	12
Dry powder extinguishers for metal fires	12

NOTE: Cylinders under jurisdiction of the U.S. Department of Transportation (formerly Interstate Commerce Commission) may require hydrostatic testing at more frequent periods.

(d) Nitrogen cylinders (or other cylinders used for inert-gas storage), such as found on wheeled extinguishers, shall be tested at a 5-year interval.

(e) On those extinguishers which are equipped with a shut-off nozzle at the outlet end of the hose, a hydrostatic test shall be performed on the hose with its couplings (but without the discharge nozzle) at the test interval specified for the unit on which the hose is installed.

(f) The test pressure for dry chemical and dry powder hose assemblies requiring a hydrostatic test shall be at a test pressure of 300 pounds per square inch for a 1-minute period. Carbon dioxide hose assemblies requiring a hydrostatic test shall be at test pressure of 1,250 p.s.i. for a 1-minute period.

(g) Hydrostatic tests are not required on fire pails, pump-type water and/or antifreeze extinguishers, and factory-sealed disposable (nonrefillable) containers. If such an extinguisher or water pail shows evidence of corrosion or mechanical injury, it may be unsafe or unsuitable for further use and shall be replaced with a new unit.

(h) The hydrostatic test date shall be recorded on a record tag of metal or equally durable material, or a suitable metallized decal which shall be affixed (by a heatless process) to the shell of an extinguisher which favorably passes the hydrostatic test. The record tag shall contain the following information: Date of test, test pressure, and name or initials of person or agency making the test.

(i) For extinguishers subjected to an original factory test pressure of 350 p.s.i. or greater, the test pressure shall be 75 percent of the factory test pressure (as noted on the extinguisher nameplate), but in no case less than 300 p.s.i., see Table L-4. For extinguishers subjected to an original factory test pressure of less than 350 p.s.i., the test pressure shall be 75 percent of the factory test

pressure; see Table L-4. Pressure shall be applied at a rate of rise to reach the test pressure in approximately 1 minute, and the pressure shall be held for 1 minute, after which it shall be released.

TABLE L-4

HYDROSTATIC TEST PRESSURE REQUIREMENTS—NON-ICC SHELLS, SHELLS NOT SPECIFIED IN U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS, (FORMERLY INTERSTATE COMMERCE COMMISSION)

Extinguisher Type	Original Factory test pressure	Requires hydrostatic test pressure
All dry chemical and dry powder.	400 p.s.i. or greater. 350-399 p.s.i. below 350 p.s.i.	75% of factory test pressure. 300 p.s.i. 75% of factory test pressure.
Foam—500 p.s.i. factory test.	500	375.
Foam—350 p.s.i. factory test.	350	300.
Soda-acid—500 p.s.i. factory test.	500	375.
Stored-pressure or cartridge-operated water-type (including antifreeze and loaded-stream).	400 p.s.i. or greater. 350-399 p.s.i. below 350.	75% of factory test pressure. 300 p.s.i. 75% of factory test pressure.

(j) Carbon dioxide extinguishers, nitrogen cylinders, and other cylinders or cartridges used for the storage of inert, compressed gases shall be hydrostatically tested in accordance with the requirements of the U.S. Department of Transportation (formerly Interstate Commerce Commission see 49 CFR October 1, 1972 Parts 171-190.)

(k) Extinguisher shells, cartridges, or cylinders which show leakage or permanent distortion in excess of specified limits, or which rupture, shall be removed from service. [Order 74-27, § 296-24-59007, filed 5/7/74; Order 73-5, § 296-24-59007, filed 5/9/73 and Order 73-4, § 296-24-59007, filed 5/7/73.]

WAC 296-24-600 Standpipe and hose systems. [Order 73-5, § 296-24-600, filed 5/9/73 and Order 73-4, § 296-24-600, filed 5/7/73.]

WAC 296-24-60001 General requirements. (1) Application. Where standpipe and hose systems are provided they shall meet the design requirements of the National Fire Protection Association's Standard for the Installation of Standpipe and Hose Systems NFPA 14-1970 and the requirements of WAC 296-24-60001 through WAC 296-24-60007.

(2) Closets and Cabinets. Closets and cabinets used to contain fire hose shall be of sufficient size to permit the installation of the necessary equipment at hose stations, and so designed as not to interfere with the prompt handling of the hose and equipment at time of fire. They shall be used for fire equipment only.

(3) Protection of Standpipes. Standpipes shall be so located that they are protected against mechanical and fire damage. [Order 73-5, § 296-24-60001, filed 5/9/73 and Order 73-4, § 296-24-60001, filed 5/7/73.]

WAC 296-24-60003 Hose outlets. (1) Location of Hose. (a) Hose outlets shall be within easy reach of a person standing on the floor and in no case shall be over 6 feet from the floor. Hose stations shall be located conspicuously within the immediate area and where not likely to be obstructed. Hose may be located at one side of the standpipe and supplied by short lateral connections to the standpipe where necessary to avoid obstructions.

(b) For Class III service, the outlets for large hose shall be located in a stairway enclosure, and for small hose the outlets shall be located in the corridor or space adjacent to the stairway enclosure.

(2) Hose Connections. (a) Standpipes for Class I service shall be provided with 2 1/2-inch hose connections on each floor.

(b) Stand pipes for Class II service shall be provided with 1 1/2-inch hose connections on each floor.

(c) Standpipes for Class III service shall be provided with both a 2 1/2-inch and 1 1/2-inch hose connection on each floor. The hose connections may be through one 2 1/2-inch hose valve and an easily removable 2 1/2-inch by 1 1/2-inch adapter.

(3) Hose. Each hose outlet provided for the use of building occupants (Class II and III services) shall be equipped with approved small fire hose attached and ready for use. The maximum total length of unlined hose shall be 75 feet. The maximum total length of lined hose shall be 100 feet.

(4) Hose racks or reels. Each station provided with small hose shall be equipped with an approved rack, or an approved reel, securely fastened in position; provided, that an employer may continue to use a reel acquired prior to May 20, 1974, even though it is not approved, so long as it is in good working condition.

(5) Hose Valves. (a) An approved hose valve shall be provided at each outlet for attachment of hose.

(b) Where the static pressure at any standpipe outlet for small hose exceeds 100 pounds per square inch, an approved device shall be installed at the outlet to reduce the pressure so that the nozzle pressure will be approximately 80 pounds per square inch.

NOTE: Pressure reducers are not required on standpipe outlets for 2 1/2-inch hose because it is assumed 2 1/2-inch hose will be attached only when the persons likely to use it are trained in handling large streams.

(c) National (American) Standard Fire Hose Coupling Screw Threads shall be used whenever they will fit existing equipment; (see Standard for Screw Threads Gaskets for Fire Hose Couplings, NFPA No. 194-1968).

(6) Nozzles. Nozzles shall be of an approved type. Size of nozzles for small hose shall be not larger than one-half inch.

(7) Dry standpipe Identification. Each hose connection on dry standpipes shall be provided with a conspicuous, durable, and permanently legible sign reading "Dry Standpipe for Fire Department Use Only." [Order 74-27, § 296-24-60003, filed 5/7/74; Order 73-5, § 296-24-60003, filed 5/9/73 and Order 73-4, § 296-24-60003, filed 5/7/73.]

WAC 296-24-60005 Water supplies. (1) Minimum Supply for Class I Service. (a) The minimum supply for Class I service shall be sufficient to provide 500 gallons per minute for a period of at least thirty (30) minutes.

(b) Where more than one standpipe is required, the minimum supply shall be 500 gallons per minute for the first standpipe and 250 gallons per minute for each additional standpipe, the total supply not to exceed 2,500 gallons a minute, for a period of at least thirty (30) minutes.

(c) The supply shall be sufficient to maintain a residual pressure of 65 pounds per square inch at the topmost outlet of each standpipe (including the roof outlet) with 500 gallons per minute flowing.

(2) Minimum Supply for Class II Service. The minimum supply for Class II service shall be sufficient to provide 100 gallons per minute for a period of at least thirty (30) minutes. The supply shall be sufficient to maintain a residual pressure of 65 pounds per square inch at the topmost outlet of each standpipe (including the roof outlet) with 100 gallons per minute flowing.

(3) Minimum Supply for Class III Service. The minimum supply for Class III service shall be the same as for Class I service.

(4) Fire Department Connections. (a) One or more fire department connections shall be provided for each Class I or Class III standpipe system.

(b) In high-rise buildings having two or more zones, a fire department connection shall be provided for each zone.

(c) Fire department connections shall be properly supported.

(d) There shall be no shutoff valve in the fire department connection.

(e) An approved straightway check valve shall be installed in each fire department connection, located as near as practicable to the point where it joins the system.

(f) The pipe between the check valve and the outside hose coupling shall be equipped with an approved automatic drip, arranged to discharge to a proper place.

(g) Hose connections shall be approved type and shall be equipped with standard caps, properly secured and arranged for easy removal by fire departments.

(h) Hose coupling threads shall conform to those used by the local fire department. (American) National Standard Fire-Hose Coupling Screw Threads shall be used whenever they will fit the local fire department hose threads; (see Standard for Screw Threads and Gaskets for Fire Hose Couplings, NFPA No. 194-1968.)

(i) Hose connections should be on the street side of buildings and shall be located and arranged so that hose

lines can be readily and conveniently attached to the inlets without interference from any nearby objects including buildings, fences, posts, or other fire department connections.

(j) Hose connections shall be designated by a sign having raised letters at least one inch in size cast on a plate or fitting, reading "Standpipe."

(k) If hose connection does not serve all of the building an appropriate and durable sign shall be attached indicating the portions of the building served. [Order 73-5, § 296-24-60005, filed 5/9/73 and Order 73-4, § 296-24-60005, filed 5/7/73.]

WAC 296-24-60007 Tests and maintenance. (1)

Tests. All new systems including yard piping shall be tested hydrostatically at not less than 200 pounds per square inch pressure for 2 hours, or at 50 pounds per square inch in excess of the normal pressure when the normal pressure is in excess of 150 pounds per square inch.

(2) Periodic Inspection. (a) The tanks shall be kept properly filled, and where pressure tanks are employed, a pressure of at least 75 pounds per square inch shall be maintained at all times.

NOTE: For further details, see Standard for Water Tanks for Private Fire Protection, NFPA No. 22-1971.

(b) The valves in the main connection to the automatic sources of water supply shall be open at all times. The hose valves should be frequently examined to see that they are tight.

NOTE: For further details, see Care of Fire Hose, NFPA No. 198-1972.

[Order 73-5, § 296-24-60007, filed 5/9/73 and Order 73-4, § 296-24-60007, filed 5/7/73.]

WAC 296-24-605 Fixed fire suppression equipment—Automatic sprinkler systems. [Order 73-5, § 296-24-605, filed 5/9/73 and Order 73-4, § 296-24-605, filed 5/7/73.]

WAC 296-24-60501 General requirements. (1) Design. When automatic sprinkler systems are provided they shall meet design requirements of the National Fire Protection Association's Standard for the Installation of Sprinkler Systems NFPA No. 13-1969 and the requirements of WAC 296-24-605 through WAC 296-24-60509.

(2) Water Supply. Every automatic sprinkler system shall have at least one automatic water supply of adequate pressure, capacity and reliability.

(3) Fire Department Connection. A connection through which a fire department can pump water into the sprinkler system makes a desirable auxiliary supply. For this purpose, one or more fire department connections shall be provided in all cases. [Order 73-5, § 296-24-60501, filed 5/9/73 and Order 73-4, § 296-24-60501, filed 5/7/73.]

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WAC 296-24-60503 Fire department connections.

(1) Size. Pipe size shall not be less than 4 inches for fire engine connections and not less than 6 inches for fire-boat connections, except that 3-inch pipe may be used to connect a single hose contion to a 3-inch or smaller riser.

(2) Valves. (a) An approved straightaway check valve shall be installed in each fire department connection, located as near as practicable to the point where it joins the system.

(b) There shall be no shutoff valve in the fire department connection.

(3) Support. Fire department connections shall be properly supported.

(4) Hose Connections. (a) Hose connections shall be of approved type.

(b) Hose coupling threads shall conform to those used by the local fire department. National (American) Standard Fire Hose Coupling Screw Threads shall be used whenever they will fit the local fire department hose.

(c) Hose connections shall be equipped with caps, properly secured and arranged for easy removal by fire departments.

(d) Hose connections shall be located and arranged so that hose lines can be readily and conveniently attached to the inlets without interference from any nearby objects including buildings, fences, posts, or other fire department connections.

(e) Hose connections shall be designated by a sign having raised letters at least 1 inch in size cast on plate or fitting reading for service designated: Viz— "AUTO-SPKR." or "OPEN SPKR." [Order 73-5, § 296-24-60503, filed 5/9/73 and Order 73-4, § 296-24-60503, filed 5/7/73.]

WAC 296-24-60505 Sprinkler alarms. (1) General.

(a) Waterflow alarms shall be provided on all sprinkler installations.

(b) An alarm unit shall include an approved mechanical alarm, horn, or siren, or an approved weatherproof electric gong, bell, horn, or siren on the outside of the building or approved electric gongs, bells, horns, or sirens inside the building, or a combination of such devices.

(c) All alarm apparatus shall be so located and installed that all parts are readily accessible for inspection, removal, and repair, and shall be substantially supported. Outdoor mechanical or electrically operated bells shall be of weatherproof and guarded type. On each alarm check valve used under conditions of variable water pressure, a retarding device shall be installed. Suitable valves shall be provided in the connections to retarding chambers, to permit repair or removal without shutting off sprinkler; these valves shall be so arranged that they may be locked or sealed in the open position.

(2) Waterflow Detecting Devices. (a) The alarm apparatus for a wet-pipe system shall consist of an approved alarm check valve or other approved water flow detecting alarm device with the necessary attachments required to give an alarm.

(b) The alarm apparatus for a dry-pipe system shall consist of approved alarm attachments to the dry-pipe valve. When a dry-pipe valve is located on the system side of an alarm valve, the actuating device of the alarms for the dry-pipe valve may be connected to the alarms on the wet-pipe system.

(c) The alarm apparatus for preaction and deluge systems shall consist of approved electric alarm attachments, actuated by a thermostatic system independently of flow of water in the system.

(3) Drains. Drains from alarm devices shall be so arranged that there will be no danger of freezing, and so that there will be no overflowing at the alarm apparatus, at domestic connections or elsewhere with the sprinkler drains wide open and under pressure. [Order 73-5, § 296-24-60505, filed 5/9/73 and Order 73-4, § 296-24-60505, filed 5/7/73.]

WAC 296-24-60507 Maintenance of sprinkler system. A sprinkler system installed under this Standard shall be properly maintained for efficient service. The employer is responsible for the condition of his sprinkler system and must use due diligence in keeping the system in good operating condition. [Order 76-6, § 296-24-60507, filed 3/1/76; Order 73-5, § 296-24-60507, filed 5/9/73 and Order 73-4, § 296-24-60507, filed 5/7/73.]

WAC 296-24-60509 Sprinkler head clearance. (1) Type I Storage. Clearance of at least 36 inches shall be maintained between sprinkler deflectors and top of storage to reduce the possibility of obstruction to the distribution of water.

(2) Type II Storage. Clearance of at least 18 inches shall be maintained between sprinkler deflectors and top of storage to reduce the possibility of obstruction to the distribution of water.

(3) Type III Storage. In sprinklered buildings, at least 18 inches clearance between sprinkler deflectors and top of storage shall be maintained. [Order 73-5, § 296-24-60509, filed 5/9/73 and Order 73-4, § 296-24-60509, filed 5/7/73.]

WAC 296-24-615 Fixed dry chemical extinguishing systems. [Order 73-5, § 296-24-615, filed 5/9/73 and Order 73-4, § 296-24-615, filed 5/7/73.]

WAC 296-24-61501 General requirements. (1) Design. When dry chemical extinguishing systems are provided they shall meet the design requirements of the National Fire Protection Association's "Standard for Dry Chemical Extinguishing Systems" NFPA No. 17-1972 and the requirements of this section.

(2) Safety Requirements. Where there is a possibility that personnel may be exposed to a dry chemical discharge, suitable safeguards shall be provided to insure prompt evacuation of such locations, and also to provide means for prompt rescue of any trapped personnel. [Order 73-5, § 296-24-61501, filed 5/9/73 and Order 73-4, § 296-24-61501, filed 5/7/73.]

WAC 296-24-61503 Alarms and indicators. (1) General. Alarms and/or indicators are used to indicate the operation of the system, hazard to personnel, or failure of any supervised device or equipment. The devices may be audible or visual. The type, number, and location of the devices shall be such that their purpose is satisfactorily accomplished.

(2) Operation Alarm. (a) An alarm or indicator shall be provided to show that the system has operated, that personnel response may be needed, and that the system should be charged.

(b) Alarms indicating failure of supervised devices or equipment shall give prompt and positive indication of any failure and shall be distinctive from alarms indicating operation or hazardous conditions. [Order 74-27, § 296-24-61503, filed 5/7/74; Order 73-5, § 296-24-61503, filed 5/9/73 and Order 73-4, § 296-24-61503, filed 5/7/73.]

WAC 296-24-61505 Inspection and maintenance.

(1) Inspection and Tests. (a) At least annually, all dry chemical systems including alarms, shutdowns, and other associated equipment, shall be thoroughly inspected and checked for proper operation by a competent inspector.

(b) The purpose of the inspection and testing prescribed by this subsection (c) of this section shall be not only to insure that the system is in full operating condition but also to indicate the probable continuance of that condition until the next inspection. Attention at this inspection shall be given to any extension of the hazard protected by the system.

(c) The inspector's report, with recommendations, if any, shall be filed with the employer or with whomever is designated by the employer.

(d) Between the regular annual inspection or tests, the system shall be inspected visually or otherwise by competent personnel, following a predetermined schedule.

(e) At least semiannually, all expellant gas containers shall be checked by pressure or weight against the required minimums.

(f) At least semiannually, all stored pressure dry chemical containers shall be checked by pressure and weight against the required minimums.

(g) Except for stored pressure systems, at least annually the dry chemical in the system storage container shall be sampled from the top center and also near the wall to determine the existence of lumps harder than will be friable when dropped from a height of 4 inches.

(2) Maintenance. (a) These fixed dry chemical systems shall be maintained in full operating condition at all times. Use, impairment, and restoration of this protection shall be reported promptly to the employer.

(b) Any troubles or impairments shall be corrected at once by competent personnel. [Order 76-6, § 296-24-61505, filed 3/1/76; Order 73-5, § 296-24-61505, filed 5/9/73 and Order 73-4, § 296-24-61505, filed 5/7/73.]

WAC 296-24-620 Carbon dioxide extinguishing systems. [Order 73-5, § 296-24-620, filed 5/9/73 and Order 73-4, § 296-24-620, filed 5/7/73.]

WAC 296-24-62001 General requirements. (1) Design. When carbon dioxide extinguishing systems are provided they shall meet the design requirements of the National Fire Protection Association's "Standard on Carbon Dioxide Extinguishing Systems" NFPA No. 12-1972 and the requirements of WAC 296-24-620 through WAC 296-24-62003.

(2) Safety Requirements. In any use of carbon dioxide where there is a possibility that employees may be trapped in, or enter into atmospheres made hazardous by a carbon dioxide discharge, suitable safeguards shall be provided to insure prompt evacuation of and to prevent entry into such atmospheres and also to provide means for prompt rescue of any trapped personnel. Such safety items as personnel training, warning signs, discharge alarms, predischARGE alarms, and breathing apparatus shall be considered. [Order 73-5, § 296-24-62001, filed 5/9/73 and Order 73-4, § 296-24-62001, filed 5/7/73.]

WAC 296-24-62003 Inspection and maintenance.

(1) Inspection and Tests. (a) At least annually, all carbon dioxide systems shall be thoroughly inspected and tested for proper operation by a competent engineer or inspector.

(b) The goal of this inspection and testing shall be not only to insure that the system is in full operating condition but shall indicate the probable continuance of that condition until the next inspection.

(c) Suitable discharge tests shall be made when any inspection indicates their advisability.

(d) Between the regular service contract inspection or tests, the system shall be inspected visually or otherwise by competent personnel, following a predetermined schedule.

(e) At least semiannually, all high pressure cylinders shall be weighed. If, at any time, a container shows a loss in net content or more than 10 percent, it shall be refilled or replaced.

(f) If, at any time, a low pressure container shows a loss of more than 10 percent, it shall be refilled, unless the minimum gas requirements are still provided.

(2) Maintenance. (a) These carbon dioxide systems shall be maintained in full operating condition at all times.

(b) Any troubles or impairments shall be corrected at once by competent personnel. [Order 74-27, § 296-24-62003, filed 5/7/74; Order 73-5, § 296-24-62003, filed 5/9/73 and Order 73-4, § 296-24-62003, filed 5/7/73.]

WAC 296-24-625 Local fire alarm signaling systems. (1) General requirements. Where local fire alarm signaling systems are provided, they shall meet the design requirements of the National Fire Protection Association's "Standard for the Installation, Maintenance, and Use of Local Protective Signaling Systems for Watchman, Fire Alarm and Supervisory Service". NFPA No. 72A-1967 and the requirements of this section.

(2) Fire alarm boxes.

(a) General. Manual fire alarm boxes shall be approved for the particular application and shall be used only for the fire protective signaling purposes. Combined fire alarm and watchman's signaling boxes are acceptable.

(b) Mounting. Each box shall be securely mounted.

(c) Distribution. Manual fire alarm boxes shall be distributed throughout the protected area so that they are unobstructed, readily accessible, and located in the normal path of exit from the area. Additional boxes shall be provided on each floor to obtain a maximum horizontal travel distance of 200 feet to the nearest box.

(3) Maintenance. All systems shall be under the supervision of qualified persons. These persons shall cause tests and inspections to be made at weekly intervals, and shall have general charge of all alterations and additions to the systems under their supervision. [Order 74-27, § 296-24-625, filed 5/7/74.]

Part H-1

HAND AND PORTABLE POWERED TOOLS AND OTHER HAND-HELD EQUIPMENT

WAC

296-24-650	Hand and portable powered tools and equipment—General.
296-24-65001	General requirements.
296-24-65003	Compressed air used for cleaning.
296-24-65005	Compressed air tools.
296-24-65007	Air hammer.
296-24-655	Guarding of portable powered tools.
296-24-65501	Portable powered tools.
296-24-657	Pneumatic powered tools and hose.
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WAC 296-24-650 Hand and portable powered tools and equipment—General. [Order 73-5, § 296-24-650, filed 5/9/73 and Order 73-4, § 296-24-650, filed 5/7/73.]

WAC 296-24-65001 General requirements. Each employer shall be responsible for the safe condition of tools and equipment used by employees, including tools and equipment which may be furnished by employees. [Order 73-5, § 296-24-65001, filed 5/9/73 and Order 73-4, § 296-24-65001, filed 5/7/73.]

WAC 296-24-65003 Compressed air used for cleaning. Compressed air shall not be used for cleaning purposes except where reduced to less than 30 p.s.i. and then only with effective chip guarding and personal protective equipment. [Order 73-5, § 296-24-65003, filed 5/9/73 and Order 73-4, § 296-24-65003, filed 5/7/73.]

WAC 296-24-65005 Compressed air tools. (1) In the use of compressed air tools, care should be used to prevent the tool from being shot from the gun.

(2) When momentarily out of use the gun should be laid in such position that the tool cannot fly out if the pressure is accidentally released. When not in use, all tools should be removed from the gun.

(3) In disconnecting a compressed air tool from the air line, care should be exercised first to shut off the pressure and then to operate the tool to exhaust the pressure remaining in the hose.

(4) Compressed air hose or guns shall not be pointed at or brought into contact with the body of any person. [Order 73-5, § 296-24-65005, filed 5/9/73 and Order 73-4, § 296-24-65005, filed 5/7/73.]

WAC 296-24-65007 Air hammer. (1) Before laying down an air hammer remove tool from hammer unless it is held in place by safety catch. [Order 73-5, § 296-24-65007, filed 5/9/73 and Order 73-4, § 296-24-65007, filed 5/7/73.]

WAC 296-24-655 Guarding of portable powered tools. [Order 73-5, § 296-24-655, filed 5/9/73 and Order 73-4, § 296-24-655, filed 5/7/73.]

WAC 296-24-65501 Portable powered tools. (1) Portable Circular Saws. (a) All portable, power-driven circular saws having a blade diameter greater than 2 in. 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.

(b) (1)(a) of this section does not apply to circular saws used in the meat industry for meat cutting purposes.

(2) Switches and controls. (a) All hand-held powered circular saws having a blade diameter greater than 2 inches, electric, hydraulic or pneumatic chain saws, and percussion tools without positive accessory holding means shall be equipped with a constant pressure switch or control that will shut off the power when the pressure is released. All hand-held gasoline powered chain saws shall be equipped with a constant pressure throttle control that will shut off the power to the saw chain when the pressure is released.

(b) All hand-held powered drills, tappers, fastener drivers, horizontal, vertical, and angle grinders with wheels greater than 2 inches in diameter, disc sanders with discs greater than 2 inches in diameter, belt sanders, reciprocating saws, saber, scroll, and jig saws with blade shanks greater than a nominal one-fourth inch, and other similarly operating powered tools shall be equipped with a constant pressure switch or control and may have a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

(c) All other hand-held powered tools, such as, but not limited to, platen sanders, grinders with wheels 2 inches in diameter or less, disc sanders with discs 2 inches in diameter or less, routers, planers, laminate trimmers, nibblers, shears, saber, scroll, and jig saws with blade shanks a nominal one-fourth of an inch wide or less, may be equipped with either a positive "on-off" control, or other controls as described by (2)(a) and (b) of this section.

(1) Saber, scroll, and jig saws with nonstandard blade holders may use blades with shanks which are nonuniform in width, provided the narrowest portion of the blade shank is an integral part in mounting the blade.

(ii) Blade shank width shall be measured at the narrowest portion of the blade shank when saber, scroll, and jig saws have nonstandard blade holders.

(iii) "Nominal" in this section means +0.05 inch.

(d) The operating control on hand-held power tools shall be so located as to minimize the possibility of its accidental operation, if such accidental operation would constitute a hazard to employees.

(e) This paragraph does not apply to concrete vibrators, concrete breakers, powered tampers, jack hammers, rock drills, garden appliances, household and kitchen appliances, personal care appliances, medical or dental equipment, or to fixed machinery.

(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. The unused run of the sanding belt shall be guarded against accidental contact.

(4) Cracked saws. All cracked saws shall be removed from service.

(5) Grounding. Portable electric powered tools shall meet the electrical requirements of WAC 296-24-950 and 955. [Order 74-27, § 296-24-65501, filed 5/7/74; Order 73-5, § 296-24-65501, filed 5/9/73 and Order 73-4, § 296-24-65501, filed 5/7/73.]

WAC 296-24-657 Pneumatic powered tools and hose. [Order 73-5, § 296-24-657, filed 5/9/73 and Order 73-4, § 296-24-657, filed 5/7/73.]

WAC 296-24-65701 Portable tools. (1) The operating trigger on portable hand-operated utilization equipment shall be so located as to minimize the possibility of its accidental operation and shall be arranged to close the air inlet valve automatically when the pressure of the operator's hand is removed.

(2) A tool retainer shall be installed on each piece of utilization equipment which, without such a retainer, may eject the tool. [Order 73-5, § 296-24-65701, filed 5/9/73 and Order 73-4, § 296-24-65701, filed 5/7/73.]

WAC 296-24-65703 Airhose. Hose and hose connections used for conducting compressed air to utilization equipment shall be designed for the pressure and service to which they are subjected. [Order 73-5, § 296-24-65703, filed 5/9/73 and Order 73-4, § 296-24-65703, filed 5/7/73.]

WAC 296-24-660 Portable abrasive wheels. [Order 73-5, § 296-24-660, filed 5/9/73 and Order 73-4, § 296-24-660, filed 5/7/73.]

WAC 296-24-66001 Abrasive wheel terms. (1) Mounted Wheels. Mounted wheels, usually 2-inch diameter or smaller, and of various shapes, may be either organic or inorganic bonded abrasive wheels. They are secured to plain or threaded steel mandrels.

(2) Tuck Pointing. Removal, by grinding, of cement, mortar, or other nonmetallic jointing material.

(3) Tuck Pointing Wheels. Tuck pointing wheels, usually Type 1, reinforced organic bonded wheels have diameter, thickness and hole size dimension. They are subject to the same limitations of use and mounting as Type 1 wheels defined in WAC 296-24-66001(10).

LIMITATION: Wheels used for tuck pointing should be reinforced, organic bonded.

(4) Portable Grinding. A grinding operation where the grinding machine is designed to be hand held and may be easily moved from one location to another.

(5) Organic Bonded Wheels. Organic wheels are wheels which are bonded by means of an organic material such as resin, rubber, shellac, or other similar bonding agent.

(6) Safety Guard. A safety guard is an enclosure designed to restrain the pieces of the grinding wheel and furnish all possible protection in the event that the wheel is broken in operation.

(7) Reinforced Wheels. The term "reinforced" as applied to grinding wheels shall define a class of organic wheels which contain strengthening fabric or filament. The term "reinforced" does not cover wheels using such mechanical additions as steel rings, steel cup backs or wire or tape winding.

(8) Type 11 Flaring Cup Wheels. Type 11 flaring cup wheels have double diameter dimensions D and J, and in

addition have thickness, hole size, rim and back thickness dimensions. Grinding is always performed on rim face, W dimension. Type 11 wheels are subject to all limitations of use and mounting listed for Type 6 straight sided cup wheels definition in WAC 296-24-66001(9).

LIMITATION: Minimum back thickness, E dimension, should not be less than one-fourth T dimension. In addition when unthreaded hole wheels are specified the inside flat, K dimension, shall be large enough to accommodate a suitable flange.

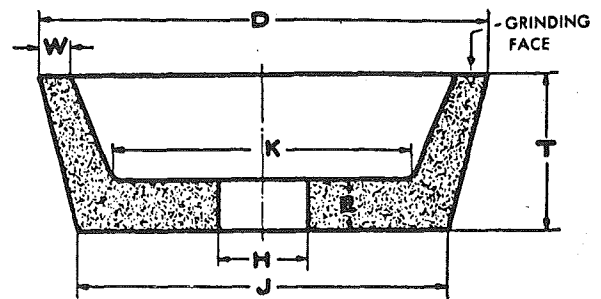


Figure P-1

Type 11—Flaring-cup Wheel Side grinding wheel having a wall flared or tapered outward from the back. Wall thickness at the back is normally greater than at the grinding face (W).

(9) Type 6 Straight Cup Wheels. Type 6 cup wheels have diameter, thickness, hole size, rim thickness, and back thickness dimensions. Grinding is always performed on rim face, W dimension.

LIMITATION: Minimum back thickness, E dimension, should not be less than one-fourth T dimension. In addition, when unthreaded hole wheels are specified, the inside flat, K dimension, must be large enough to accommodate a suitable flange.

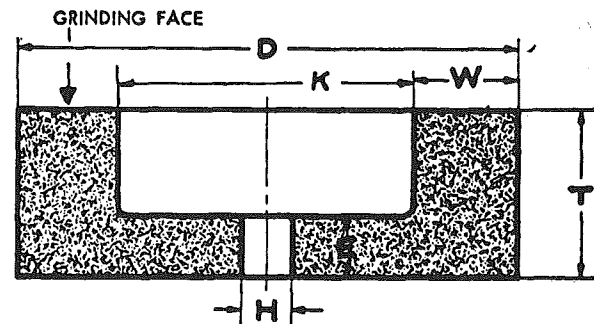


Figure P-2

Type 6—Straight-cup Wheel

Side grinding wheel having a diameter, thickness and hole with one side straight or flat and the opposite side recessed. This type, however, differs from Type 5 in that the grinding is performed on

the wall of the abrasive created by difference between the diameter of the recess and the outside diameter of the wheel. Therefore, the wall dimension "W" takes precedence over the diameter of the recess as an essential intermediate dimension to describe this shape type.

(10) Type 1 Straight Wheels. Type 1 straight wheels have a diameter, thickness, and hole size dimensions and should be used only on the periphery. Type 1 wheels shall be mounted between flanges.

LIMITATION: Hole dimension (H) should not be greater than two-thirds of wheel diameter dimension (D) for precision, cylindrical, centerless, or surface grinding applications. Maximum hole size for all other application should not exceed one-half wheel diameter.

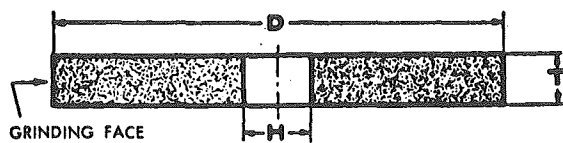


Figure P-3

Type 1—Straight Wheel

Peripheral grinding wheel having a diameter, thickness and hole.

[Order 73-5, § 296-24-66001, filed 5/9/73 and Order 73-4, § 296-24-66001, filed 5/7/73.]

WAC 296-24-66003 General requirements. (1) All abrasive wheels shall be used only on machines provided with Safety Guards as defined in the following sections through WAC 296-24-66011.

EXCEPTIONS: This requirement shall not apply to the following classes of wheels and conditions.

(a) Wheels used for internal work while within the work being ground.

(b) Mounted wheels used in portable operations 2 inches and smaller in diameter.

(c) Types 16, 17, 18, 18R, and 19 cones and plugs and threaded hole pot balls as illustrated and described by 1.4.11 of ANSI B 7.1-1970 Safety Code for the Use, Care and Protection of Abrasive Wheels, where the work offers protection.

(2) The safety guard 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.

(a) Exception: Safety guards on all operations where the work provides a suitable measure of protection to the operator, may be so constructed that the spindle end, nut, and outer flange are exposed; and where the nature of the work is such as to entirely cover the side of the wheel, the side covers of the guard may be omitted.

(b) Exception. The spindle end, nut, and outer flange may be exposed on portable machines designed for, and used with, type 6, 11, 27, and 28 abrasive wheels, cutting off wheels, and tuck pointing wheels.

(c) Exception: The spindle end, nut, and outer flange may be exposed on machines designed as portable saws. [Order 74-27, § 296-24-66003, filed 5/7/74; Order 73-5, § 296-24-66003, filed 5/9/73 and Order 73-4, § 296-24-66003, filed 5/7/73.]

WAC 296-24-66005 Cup wheels. Cup wheels (Types 6 and 11) shall be guarded by:

(1) Safety guards as specified in WAC 296-24-66003; or,

(2) Special "revolving cup guards" which mount behind the wheel and turn with it. They shall be made of steel or other material with adequate strength and shall enclose the wheel sides upward from the back for one-third of the wheel thickness. The mounting features shall conform with all regulations. (See WAC 296-24-66011.) It is necessary to maintain clearance between the wheel side and the guard. The clearance shall not exceed one-sixteenth inch; or,

(3) Some other form of guard that will insure as good protection as that which would be provided by the guards specified in WAC 296-24-66005 (1) or (2). [Order 73-5, § 296-24-66005, filed 5/9/73 and Order 73-4, § 296-24-66005, filed 5/7/73.]

WAC 296-24-66007 Vertical portable grinders.

Safety guards used on machines known as right angle head or vertical portable grinders shall have a maximum exposure angle of 180°, and the guard shall be located so as to be between the operator and the wheel during use. Adjustment of guard shall be such that pieces of an accidentally broken wheel will be deflected away from the operator. (See Figure P-4.)

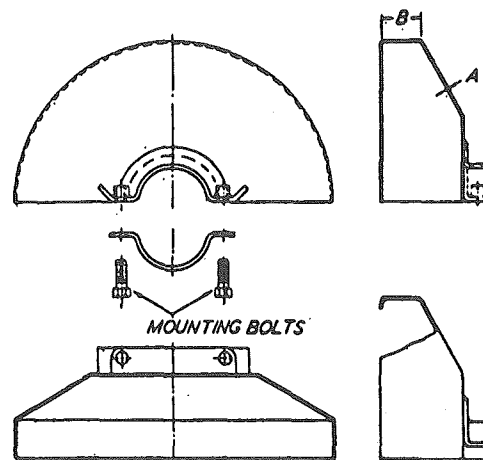


Figure No. P-4

[Order 73-5, § 296-24-66007, filed 5/9/73 and Order 73-4, § 296-24-66007, filed 5/7/73.]

WAC 296-24-66009 Other portable grinders. The maximum angular exposure of the grinding wheel periphery and sides for safety guards used on other portable grinding machines shall not exceed 180° and the top half of the wheel shall be enclosed at all times. (See Figures P-5 and P-6.)

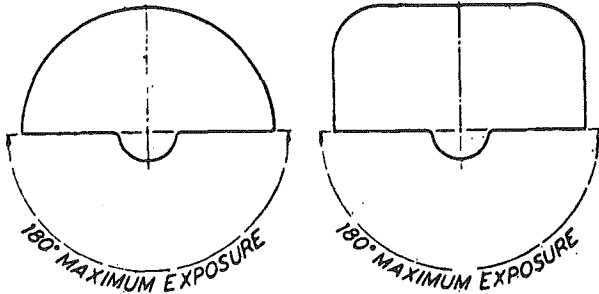


Figure No. P-5

Figure No. P-6

[Order 73-5, § 296-24-66009, filed 5/9/73 and Order 73-4, § 296-24-66009, filed 5/7/73.]

WAC 296-24-66011 Mounting and inspection of abrasive wheels. (1) Immediately before mounting, all wheels shall be closely inspected and sounded by the user (ring test) to make sure they have not been damaged in transit, storage, or otherwise. The spindle speed of the machine shall be checked before mounting of the wheel to be certain that it does not exceed the maximum operating speed marked on the wheel. Wheels should be tapped gently; if they sound cracked (dead), they shall not be used.

NOTE: Wheels should be tapped gently with a light nonmetallic implement, such as the handle of a screwdriver for light wheels, or a wooden mallet for heavier wheels. This is known as the "Ring Test".

(2) Grinding wheels shall fit freely on the spindle and remain free under all grinding conditions. The machine spindle shall be made to nominal (standard) size plus zero minus .002 inch, and the wheel hole shall be made suitably oversize to assure safety clearance under the conditions of operating heat and pressure.

NOTE: A controlled clearance between the wheel hole and the machine spindle (or wheel sleeves or adaptors) is essential to avoid excessive pressure from mounting and spindle expansion.

(3) All contact surfaces of wheels, blotters, and flanges shall be flat and free of foreign matter.

(4) When a bushing is used in the wheel hole it shall not exceed the width of the wheel and shall not contact the flanges.

(5) For requirements for the use of flanges and blotters see WAC 296-24-18007.

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NOTE: Excluded machinery. Natural sandstone wheels and metal, wooden, cloth, or paper discs, having a layer of abrasive on the surface are not covered by this section.

[Order 74-27, § 296-24-66011, filed 5/7/74; Order 73-5, § 296-24-66011, filed 5/9/73 and Order 73-4, § 296-24-66011, filed 5/7/73.]

WAC 296-24-662 Safety requirements for explosive-actuated fastening tools. [Order 73-5, § 296-24-662, filed 5/9/73 and Order 73-4, § 296-24-662, filed 5/7/73.]

WAC 296-24-66201 Scope. WAC 296-24-662 through WAC 296-24-66213 incorporates safety requirements for a tool or machine which, actuated by explosive or any similar means, propels a stud, pin, fastener, or other object for the purpose of affixing it by penetration to any other object. WAC 296-24-662 through WAC 296-24-66213 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. [Order 73-5, § 296-24-66201, filed 5/9/73 and Order 73-4, § 296-24-66201, filed 5/7/73.]

WAC 296-24-66203 Purpose. The purpose of this standard is to provide reasonable safety for life, limb, and property, by establishing requirements for design, care, use, and storage of explosive-actuated fastening tools. Requirements contained herein shall apply to tools made, sold or modified after the effective date of these standards. Explosive-actuated tools approved prior to adoption of these standards need not be modified to conform to its rules unless the Division of Safety considers that sufficient hazard exists to warrant such action. [Order 73-5, § 296-24-66203, filed 5/9/73 and Order 73-4, § 296-24-66203, filed 5/7/73.]

WAC 296-24-66205 Definitions. (1) Hammer-Operated Piston Tool—Low Velocity Type. A tool which, by means of a heavy mass hammer supplemented by a load, moves a piston designed to be captive to drive a stud, pin, or fastener into a work surface, always starting the fastener at rest and in contact with the work surface. The tool shall be so designed that, when used with a commercially available load which will properly chamber in the tool, a test series of ten studs, pins, or fasteners will not travel at a mean velocity in excess of 300 feet per second when measured 6.5 feet from the muzzle end of the barrel. No individual shot in the test series shall exceed 300 feet per second by more than 8%.

NOTE: This measurement is obtained by use of accepted ballistic test methods.

(2) High Velocity Tool. A tool or machine which when used with a load propels or discharges a stud, pin, or fastener, at velocities in excess of 300 feet per second when measured 6.5 feet from the muzzle end of the barrel for the purpose of impinging it upon, affixing it to, or penetrating another object or material.

NOTE: This measurement is obtained by use of accepted ballistic test methods.

(3) Low Velocity Piston Tool. A tool that utilizes a piston designed to be captive to drive a stud, pin, or fastener into a work surface. The tool shall be so designed that, when used with a commercially available load which will properly chamber in the tool, a test series of ten studs, pins, or fasteners will not travel at a mean velocity in excess of 300 feet per second when measured 6.5 feet from the muzzle end of the barrel. No individual shot in the test series shall exceed 300 feet per second by more than 8%.

NOTE: This measurement is obtained by use of accepted ballistic test methods.

(4) Stud, Pin, or Fastener. A fastening device specifically designed and manufactured for use in explosive-actuated fastening tools.

(5) To Chamber. To fit properly without the use of excess force, the case being duly supported.

(6) Explosive Power Load, also known as Load. Any substance in any form capable of producing a propellant force.

(7) Tool. An explosive-actuated fastening tool, unless otherwise indicated, and all accessories pertaining thereto.

(8) Protective Shield or Guard. A device or guard attached to the muzzle end of the tool which is designed to confine flying particles.

(9) Unapproved Tool. A tool not approved, or one which does not meet the requirements of this standard. [Order 73-5, § 296-24-66205, filed 5/9/73 and Order 73-4, § 296-24-66205, filed 5/7/73.]

WAC 296-24-66207 Design requirements—High velocity tools. (1) Characteristics of Tool. High velocity tools submitted for approval shall have characteristics outlined below, and, at the discretion of the manufacturer, any additional safety features he may wish to incorporate.

(2) Protective Shield or Guard. (a) The muzzle end of the tool shall have a protective shield or guard at least 3 1/2 inches in diameter, mounted perpendicular to and concentric with the barrel, and designed to confine any fragments, particles, pins, studs, or fasteners which may create a hazard as the tool is fired against a work surface.

(b) Where a standard shield or guard cannot be used, or where it does not cover all apparent avenues through which flying particles might escape, a special shield or guard, fixture, or jig designed and built by the manufacturer of the tool being used, which provides this degree of protection, shall be used as a substitute.

(c) The tool shall be so designed that it cannot be fired unless it is equipped with a standard protective shield or guard, or a special shield, guard, fixture, or jig.

(3) Firing Mechanism. (a) The tool shall be so designed that in ordinary usage it cannot fire during loading or preparation to fire, or if it should be dropped while loaded. Firing of the tool shall be dependent upon

at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

(b) The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against a work surface with a force of at least five (5) pounds greater than the total weight of the tool.

(c) The tool shall be so designed that when equipped with the standard guard, indexed to the center position, it will not operate if the bearing surface of the guard is tilted at an angle greater than 8° from the contact with the work surface.

(4) Variable Power. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

(5) Inspection. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(6) Construction. The tool shall be so designed that all parts of the tool will be of adequate strength, with a 2 to 1 factor of safety for yield strength incorporated, to resist maximum stresses generated by firing when using any commercially available load which will properly chamber in the tool. The tool shall be so designed that it will not chamber any commercially available load that would cause a stud, pin, or fastener to travel at a velocity in excess of that allowed for a low velocity tool. The tool shall be provided with a positive means of ejecting spent, unfired, or misfired loads. [Order 73-5, § 296-24-66207, filed 5/9/73 and Order 73-4, § 296-24-66207, filed 5/7/73.]

WAC 296-24-66209 Low velocity piston tools. (1) Characteristics. Low velocity piston tools submitted for approval shall have the characteristics outlined below, and at the discretion of the manufacturer, any additional safety features he may wish to incorporate.

(2) Protective Shield or Guard. The muzzle end of the tool shall be designed so that suitable protective shields, guards, jigs, or fixtures, designed and built by the manufacturer of the tool being used, can be mounted perpendicular to the barrel. A standard spall shield shall be supplied with each tool.

(3) Firing Mechanism. (a) The tool shall be so designed that in ordinary usage it cannot fire during loading or preparation to fire, or if it should be dropped while loaded. Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

(b) The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against the work surface with a force of at least five (5) pounds greater than the total weight of the tool.

(4) Variable Power. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or

as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

(5) Inspection. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(6) Construction. The tool shall be so designed that all parts of the tool will be of adequate strength, with a 2 to 1 factor of safety for yield strength incorporated, as to resist maximum stresses generated by firing when using any commercially available load which will properly chamber in the tool. The tool shall be so designed that it will not chamber any commercially available load that would cause a stud, pin, or fastener to travel at a velocity in excess of that allowed for a low velocity tool. The tool shall be provided with a positive means of ejecting spent, unfired, or misfired loads. [Order 73-5, § 296-24-66209, filed 5/9/73 and Order 73-4, § 296-24-66209, filed 5/7/73.]

WAC 296-24-66211 Hammer-operated piston tools—Low velocity type. (1) Characteristics. Hammer-operated piston tools—low velocity type—submitted for approval shall have the characteristics outlined below, and, at the discretion of the manufacturer of the tool, any additional safety features he may wish to incorporate.

(2) Protective Shield or Guard. The muzzle end of the tool shall be so designed that suitable protective shields, guards, jigs, or fixtures, designed and built by the manufacturer of the tool being used, can be mounted perpendicular to the barrel. A standard spall shield shall be supplied with each tool.

(3) Firing Mechanism. (a) The tool shall be so designed that in ordinary usage it will not fire, propel, or discharge a stud, pin, or fastener while loading or during preparation to fire or when dropped while loaded.

(b) The firing mechanism shall be designed to be insensitive except to heavy hammer blow (in excess of 3 foot pounds).

(c) Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

(4) Variable Power. The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

(5) Inspection. The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(6) Construction. The tool shall be so designed that all parts of the tool will be of adequate strength, with a 2 to 1 factor of safety for yield strength incorporated, to resist maximum stresses generated by firing when using any commercially available load which will properly chamber in the tool. The tool shall be so designed that it will not chamber any commercially available load that would cause a stud, pin, or fastener to travel at a velocity in excess of that allowed for a low velocity tool. The

tool shall be provided with a positive means of ejecting spent, unfired, or misfired loads. [Order 73-5, § 296-24-66211, filed 5/9/73 and Order 73-4, § 296-24-66211, filed 5/7/73.]

WAC 296-24-66213 Requirements for loads and fasteners. (1) Identification of Loads. There shall be a standard means of identifying the power levels of loads used in tools. Colors and printed descriptions shall be strikingly printed on the container to provide visual identification. Color identification shall be further placed on each load to indicate the power level of the load. Such means of identification shall be uniform in color and numbering systems in accordance with the following table.

(2) Identification of Caseless loads. Caseless loads shall be coded to identify similar power load levels by color, number, configuration, or other appropriate method acceptable to the Division of Safety.

Power Level	COLOR IDENTIFICATION		Nominal Velocity (ft. per second)
	Case Color	Load Color	
1	Brass	Gray	300
2	Brass	Brown	390
3	Brass	Green	480
4	Brass	Yellow	570
5	Brass	Red	660
6	Brass	Purple	750
7	Nickel	Gray	840
8	Nickel	Brown	930
9	Nickel	Green	1,020
10	Nickel	Yellow	1,110
11	Nickel	Red	1,200
12	Nickel	Purple	1,290

NOTE: The nominal velocity as shown in the table applies to a 3/8" diameter 350 grain ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific size or type of tool.

(3) Keep Loads Segregated. Power loads of varying sizes shall be kept segregated and loads shall be kept in boxes or containers indicating their colors and power levels.

(4) Optional Identification. Where means other than the power load levels are to be used to control the penetration, and identification method acceptable to the Division of Safety shall be employed.

(5) Permissible Loads for Approved Low Velocity Tools. No load (cased or caseless) shall be used if it will accurately chamber in any existing approved commercially available low velocity piston tool or hammer operated piston tool—low velocity type—and will cause a fastener to have a (mean) velocity in excess of 300 feet per second when measured 6.5 feet from the muzzle end of the barrel. (Mean velocity shall mean that while firing a test series, the average of the velocities will not

exceed 300 feet per second and that no individual round will exceed 300 feet per second by more than 8%.)

(6) Approved Fasteners or Devices. Studs or fasteners shall be designed specifically for use in the tool in which they are being used and shall be of such quality and design that they can be safely used in the tool.

(7) Inspection. Before using a tool, the operator shall inspect it to determine to his satisfaction that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.

(8) Defective Tool. When a tool develops a defect, the operator shall immediately cease to use it, and the employer shall contact the manufacturer's authorized agent to make whatever repairs may be necessary.

(9) Tool Handling. Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any workmen, and hands should be kept clear of the open barrel end.

(10) Loading. Tools shall not be loaded unless being prepared for immediate use. A loaded tool shall not be left unattended.

(11) Misfires. In case of misfire, the operator shall hold the tool in the operating position for at least 30 seconds. He shall then try to operate the tool a second time. If second misfire occurs he shall wait another 30 seconds, holding the tool in the operating position, then proceed to remove the explosive load in strict accordance with the manufacturer's instructions. Misfired cartridges should be placed carefully in a metal container filled with water, and returned to the supervisor for disposal.

(12) Safeguarding and Storage. A tool shall never be left unattended in a place where it would be available to unauthorized persons.

(13) Unsuitable Materials for Fastening. Fasteners shall not be driven into very hard or brittle materials such as case iron, glazed tile, surface-hardened steel, glass block, live rock, face brick, hollow tile, or materials of similar nature or composition.

(14) Piercing of Materials. Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

(15) Distance from Edge of Material. Fasteners shall not be driven directly into materials such as brick or concrete closer than three (3) inches from the unsupported edge or corner, or into steel surfaces closer than one-half (1/2) inch from the unsupported edge or corner, unless a special guard, fixture, or jig is used. EXCEPTION: Low velocity tools may drive no closer than two (2) inches from an edge in concrete or one-quarter (1/4) inch in steel.

When fastening other materials, such as a 2 x 4 inch wood section to a concrete surface, it is permissible to drive a fastener of no greater than 7/32 inch shank diameter not closer than 2 inches from the unsupported edge or corner of the work surface.

(16) Pre-Drilled Holes. Fasteners shall not be driven through existing holes unless a positive guide is used to secure accurate alignment.

(17) Spalling. No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

(18) Explosive Atmosphere. Tools shall not be used in an explosive or flammable atmosphere.

(19) Guards, Shields, and Attachments. All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

(20) Faulty Tools to be Removed from Service. Any tool found not in proper working order shall be immediately removed from service and not used until proper repairs are made. The owner of the tool shall have it serviced and inspected at regular intervals by the manufacturer's authorized agent, and shall not permit it to be altered or repaired except by such persons. [Order 73-5, § 296-24-66213, filed 5/9/73 and Order 73-4, § 296-24-66213, filed 5/7/73.]

WAC 296-24-66215 Approvals. (1) Approval Required. Only tools approved by the Division of Safety shall be permitted for use.

(2) Numbering. Each approved tool shall bear some legible permanent indication as to its make and model number, which will serve as a means of identification for checking approved tools. Each approved tool shall bear a permanent and unique manufacturer's serial number. [Order 73-5, § 296-24-66215, filed 5/9/73 and Order 73-4, § 296-24-66215, filed 5/7/73.]

WAC 296-24-66217 Operation. (1) Eye Protection. Operators and assistants using tools shall be safeguarded by means of eye protection. Head and face protection shall be used, as required by working conditions, as set forth by ANSI Z87.1-1968 and Z89.1-1969.

(2) Warning that Tools are Being Used. Signs not less than 8 1/2" x 11" indicating the use of explosive-actuated tools must be prominently displayed in the immediate area where tools are being used. Such signs are available from the Division of Safety.

In lieu of posting signs, the operator may wear a fluorescent red, orange, or yellow vest with the following words in black 1 1/2" high letters printed across the back: EXPLOSIVE ACTUATED TOOL OPERATOR. [Order 73-5, § 296-24-66217, filed 5/9/73 and Order 73-4, § 296-24-66217, filed 5/7/73.]

WAC 296-24-66219 Servicing. (1) Test Daily. The tool shall be tested each day before loading to see that safety devices are in proper working condition.

(2) Method of Testing. The method of testing shall be in accordance with the manufacturer's recommended procedures. [Order 73-5, § 296-24-66219, filed 5/9/73 and Order 73-4, § 296-24-66219, filed 5/7/73.]

WAC 296-24-66221 Qualification and certification of operators. (1) Training and Testing. The operator shall be trained to use and clean the tool correctly and to recognize any worn or defective parts or defective operation. He shall also be able to use the tool safely under varying conditions, know the limitations of its use, and demonstrate his competence by actually operating the tool in the presence of the instructor. He shall be familiar with the provisions of this code and the instructions provided by the manufacturer for operation and care, and be able to read the English language. The instructor

shall have cards of the six colors used to identify power loads and test the operator's ability to distinguish the colors and shall note the result on the Department of Labor and Industries' application form No. 171.

(2) Written Examination. After training, the operator shall, to substantiate his competency, take and pass a written examination, the requirements of which shall be approved by the Division of Safety. The applicant's written examination shall be kept on file by the manufacturer's representative or authorized distributor for a minimum of 12 months and shall be made available to any authorized representative of the Division of Safety upon request.

(3) Operators Must be 18 Years of Age. Only persons who have passed their 18th birthdays shall be issued operator's cards.

(4) Possession of Card. Each qualified operator shall have an operator's card which shall be in the possession of the operator at all times while using the tool and be displayed upon request. Washington State will honor cards issued by another state providing the requirements for issuance in such state are equal to or exceed the Washington State requirements.

(5) Revocation of Card. Failure to comply with any of the rules and regulations herein contained shall be sufficient cause for the immediate revocation of an operator's card, and he shall surrender it upon demand of the Supervisor of Safety or authorized representative.

(6) Description of Card. (a) The purpose of the operator's card is to certify that the operator has completed the required training to become a qualified operator.

(b) The card should be of a size (approximately 2 1/2 x 3 1/2 inches) which will readily fit into a wallet.

(c) The face of the card should include the following text:

<u>RESTRICTIONS</u>	<u>CARD NO.</u>
State of Washington	
DEPARTMENT OF LABOR AND INDUSTRIES	
Division of Safety	
EXPLOSIVE-ACTUATED TOOL OPERATOR	
Mr.	
Address	
according to the information submitted to this office is hereby qualified to operate the following make(s) and model(s) of explosive-actuated tools	
.....	
.....	
.....	
SUPERVISOR OF SAFETY	EXPIRATION DATE

(d) A statement on the reverse side of the operator's card should indicate that the card is issued in compliance with the safety standards outlined and the operator

has had the proper training and further agrees to conform to the safe practices and regulations outlined.

The reverse side of the card should also inform the possessor that failure to comply with the applicable rules and regulations is cause for revocation of the card and it shall be surrendered upon demand by the Division of Safety.

NOTICE TO OPERATOR

This card is issued to you in accordance with the applicable requirements of the Washington State Safety Standards. Your acceptance of it shall indicate that you have received instructions in the safe operation of explosive-actuated tools of the makes and models specified and that you agree to conform to the safe practices and regulations as specified under the above-named standards. Failure to comply with safety rules applicable to the use of explosive-actuated fastening tools shall be cause for revocation of card and the card must be surrendered upon demand by the Division of Safety.

Signature of Operator

(7) Requirements for Issuance of Operator's Cards. Operators shall be given the required training as prescribed by the manufacturer and these rules. After completing such training and passing the required written examination the qualified instructor and prospective operator shall complete in triplicate application form No. 171 provided by the Division of Safety. The original application form shall be forwarded to the Supervisor of Safety who will issue all operator's cards to successful applicants. The instructor may keep one copy for his records and shall issue the remaining copy to the applicant which may serve as a temporary operating permit for a period not to exceed 30 days from date of issuance.

(8) Renewal of Operator's Cards—Cards Valid for Three Years. Operators who now possess explosive-actuated tool operator's cards issued by the Division of Safety must renew their operator's cards prior to date of expiration. Cards may be renewed by submitting a written request to the Division of Safety for renewal.

(9) Qualified Instructors. The tool manufacturer or his distributor shall recommend to the Supervisor of Safety the names of those persons who are qualified to instruct operators and shall keep the list current. The Supervisor shall determine which instructors are qualified, and shall remove the name of any instructor from the list who is known to have signed an operator's card without having given the operator proper training and instructions.

(10) Records of Operator's Cards. A record of all operator's cards shall be kept by the Division of Safety at its Olympia office. [Order 73-5, § 296-24-66221, filed 5/9/73 and Order 73-4, § 296-24-66221, filed 5/7/73.]

WAC 296-24-66223 Storage of explosive-actuated tools, instruction books, cleaning kits, and tools. (1)

Storage Box. A storage box or container equipped with a lid or cover shall be provided for the storage of explosive-actuated tools and accessories. When not in use the box shall be kept closed and locked. Loaded tools shall not be placed in the storage box.

(2) Storage of Instruction Books, etc. Instruction books, cleaning kits, and hand tools needed for maintenance or break-down purposes shall be kept in the explosive-actuated tool storage box.

(3) Storage Box Identification. The words "Explosive Tool" shall be conspicuously printed on the top of the storage box. [Order 73-5, § 296-24-66223, filed 5/9/73 and Order 73-4, § 296-24-66223, filed 5/7/73.]

WAC 296-24-66225 Use low velocity tools when possible. Low velocity tools shall be used whenever possible. The use of high velocity tools shall be limited to those applications where low velocity tools are not capable of performing the type of work involved.

State of Washington
Department of Labor and Industries
Division of Safety

APPLICATION
FOR
EXPLOSIVE-ACTUATED TOOL OPERATOR'S
CARD

Name ----- Age -----
(Print)

Address -----
(Street or Route and Box)

(City) (State) (Zip)

This request indicates that applicant is qualified as specified in "Safety Requirements for Explosive-Actuated Fastening Tools" to operate the following tools. (Include make and model)

Instructor ----- Date -----

Applicant ----- Date -----

Able to Distinguish Colors -----
Yes No

White copy—Forward to Supervisor of Safety, Olympia, Wash. Yellow copy, Instructor's copy. Pink copy, Operator retain as temporary permit. Good for 30 days.

[Order 73-5, § 296-24-66225, filed 5/9/73 and Order 73-4, § 296-24-66225, filed 5/7/73.]

WAC 296-24-665 Power lawnmowers. [Order 73-5, § 296-24-665, filed 5/9/73 and Order 73-4, § 296-24-665, filed 5/7/73.]

WAC 296-24-66501 Terms. (1) Blade Tip Circle. The path described by the outermost point of the blade as it is rotated about its shaft axis.

(2) Guards. A part or an assembly provided for shielding a hazardous area of a machine.

(3) Catcher Assemblies. Parts or combinations of parts which provide a means for collecting grass clippings or debris.

(4) Walk-Behind Mower. A mower either pushed or self-propelled and normally guided by the operator walking behind the unit.

(5) Operator Area, Walk-Behind Mowers. For discharge interference purposes, that area confined within a circle no smaller than 30 inches in diameter, the center of which is located to the rear of the mower on its longitudinal centerline 30 inches behind the nearest blade tip circle.

(6) Power Reel Mower. A lawn-cutting machine utilizing a power source to rotate one or more helically formed blades about a horizontal axis to provide a shearing action with a stationary cutter bar or bed knife.

(7) Power Rotary Mower. A lawn-cutting machine utilizing a power source to rotate one or more cutting blades about a vertical axis.

(8) Lowest Blade Position. The lowest blade position under static conditions.

(9) Riding Mower. A powered, self-propelled lawn-cutting vehicle on which the operator rides and controls the machine.

(10) Sulky Type Mower. Normally, a walk-behind mower which has been converted to a riding mower by the addition of a sulky.

(11) Deadman Control. A control designed so that it will automatically interrupt power to a drive when the operator's actuating force is removed. [Order 73-5, § 296-24-66501, filed 5/9/73 and Order 73-4, § 296-24-66501, filed 5/7/73.]

WAC 296-24-66503 General requirements. (1) Power lawnmowers of the walk-behind, riding-rotary types, and reel power lawnmowers designed for use by employees shall meet the design specifications in "American National Standard Safety Specifications for Power Lawnmowers" ANSI B71.1-1968. These specifications do not apply to sulky-type mowers, flail mowers, sickle-bar mowers, or mowers designed for commercial use.

(2) All power-driven chains, belts, and gears shall be so positioned or otherwise guarded to prevent the operator's accidental contact therewith, during normal starting, mounting, and operation of the machine.

(3) A shutoff device shall be provided to stop operation of the motor or engine. This device shall require manual and intentional reactivation to restart the motor or engine.

(4) All positions of the operating controls shall be clearly identified.

(5) The words, "Caution. Be sure the operating control(s) is in neutral before starting the engine," or similar wording shall be clearly visible at an engine starting control point on self-propelled mowers. [Order 76-6, § 296-24-66503, filed 3/1/76; Order 73-5, §

296-24-66503, filed 5/9/73 and Order 73-4, § 296-24-66503, filed 5/7/73.]

WAC 296-24-66505 Walk-behind and riding rotary mowers. (1) The mower blade shall be enclosed except on the bottom and the enclosure shall extend to or below the lowest cutting point of the blade in the lowest blade position.

(2) Guards which must be removed to install a catcher assembly shall comply with the following:

(a) Warning instructions shall be affixed to the mower near the opening stating that the mower shall not be used without either the catcher assembly or the guard in place.

(b) The catcher assembly or the guard shall be shipped and sold as part of the mower.

(c) The instruction manual shall state that the mower shall not be used without either the catcher assembly or the guard in place.

(d) The catcher assembly, when properly and completely installed, shall not create a condition which violates the limits given for the guarded opening.

(3) Openings in the blade enclosure, intended for the discharge of grass, shall be limited to a maximum vertical angle of the opening of 30°. Measurements shall be taken from the lowest blade position.

(4) The total effective opening area of the grass discharge opening(s) shall not exceed 1,000 square degrees on units having a width of cut less than 27 1/2 inches, or 2,000 square degrees on units having a width of cut 27 1/2 inches or over.

(5) The word "Caution" or stronger wording, shall be placed on the mower at or near each discharge opening.

(6) Blade(s) shall stop rotating from the manufacturer's specified maximum speed within 15 seconds after declutching, or shutting off power.

(7) In a multipiece blade, the means of fastening the cutting members to the body of the blade or disc shall be so designed that they will not become worn to a hazardous condition before the cutting members themselves are worn beyond use.

(8) The maximum tip speed of any blade shall be 19,000 feet per minute. [Order 74-27, § 296-24-66505, filed 5/7/74; Order 73-5, § 296-24-66505, filed 5/9/73 and Order 73-4, § 296-24-66505, filed 5/7/73.]

WAC 296-24-66507 Walk-behind rotary mowers.

(1) The horizontal angle of the opening(s) in the blade enclosure, intended for the discharge of grass, shall not contact the operator area.

(2) There shall be one of the following at all openings in the blade enclosure intended for the discharge of grass:

(a) A minimum unobstructed horizontal distance of 3 inches from the end of the discharge chute to the blade tip circle.

(b) A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar shall be no higher than the bottom edge of the blade enclosure.

(3) The highest point(s) on the front of the blade enclosure, except discharge openings, shall be such that

any line extending a maximum of 15° downward from the horizontal toward the blade shaft axis (axes) shall not intersect the horizontal plane within the blade tip circle. The highest point(s) on the blade enclosure front, except discharge-openings, shall not exceed 1 and 1/4 inches above the lowest cutting point of the blade in the lowest blade position. Mowers with a swingover handle are to be considered as having no front in the blade enclosure and therefore shall comply with WAC 296-24-66505(1).

(4) The mower handle shall be fastened to the mower so as to prevent loss of control by unintentional uncoupling while in operation.

(5) A positive upstop or latch shall be provided for the mower handle in the normal operating position(s). The upstop shall not be subject to unintentional disengagement during normal operation of the mower. The upstop or latch shall not allow the center or the handle grips to come closer than 17 inches horizontally behind the closest path of the mower blade(s) unless manually disengaged.

(6) A swing-over handle, which complies with the above requirements, will be permitted.

(7) Wheel drive disengaging controls, except deadman controls, shall move opposite to the direction of the vehicle motion in order to disengage the drive. Deadman controls shall comply with WAC 296-24-66501(11) and may operate in any direction to disengage the drive. [Order 74-27, § 296-24-66507, filed 5/7/74; Order 73-5, § 296-24-66507, filed 5/9/73 and Order 73-4, § 296-24-66507, filed 5/7/73.]

WAC 296-24-66509 Riding rotary mowers. (1) The highest point(s) of all openings in the blade enclosure, front shall be limited by a vertical angle of opening of 15° and a maximum distance of 1 1/4 inches above the lowest cutting point of the blade in the lowest blade position.

(2) Opening(s) shall be placed so that grass or debris will not discharge directly toward any part of an operator seated in a normal operator position.

(3) There shall be one of the following at all openings in the blade enclosure intended for the discharge of grass:

(a) A minimum unobstructed horizontal distance of 6 inches from the end of the discharge chute to the blade tip circle.

(b) A rigid bar fastened across the discharge opening, secured to prevent removal without the use of tools. The bottom of the bar shall be no higher than the bottom edge of the blade enclosure.

(4) Mowers shall be provided with stops to prevent jackknifing or locking of the steering mechanism.

(5) Vehicle stopping means shall be provided.

(6) Hand-operated wheel drive disengaging controls shall move opposite to the direction of vehicle motion in order to disengage the drive. Foot-operated wheel drive disengaging controls shall be depressed to disengage the drive. Deadman controls, both hand and foot operated, shall comply with WAC 296-24-66501(11) and may operate in any direction to disengage the drive. [Order 74-27, § 296-24-66509, filed 5/7/74; Order 73-5, §

296-24-66509, filed 5/9/73 and Order 73-4, § 296-24-66509, filed 5/7/73.]

WAC 296-24-670 Jacks. [Order 73-5, § 296-24-670, filed 5/9/73 and Order 73-4, § 296-24-670, filed 5/7/73.]

WAC 296-24-67001 Jack terms. (1) Jack. A jack is an appliance for lifting and lowering or moving horizontally a load by application of a pushing force.

NOTE: Jacks may be of the following types: Lever and ratchet, screw and hydraulic.

(2) Rating. The rating of a jack is the maximum working load for which it is designed to lift safely that load throughout its specified amount of travel.

NOTE: To raise the rated load of a jack, the point of application of the load, the applied force, and the length of lever arm should be those designated by the manufacturer for the particular jack considered.

[Order 73-5, § 296-24-67001, filed 5/9/73 and Order 73-4, § 296-24-67001, filed 5/7/73.]

WAC 296-24-67003 Loading and marking. (1) The operator shall make sure that the jack used has a rating sufficient to lift and sustain the load.

(2) The rated load shall be legibly and permanently marked in a prominent location on the jack by casting, stamping, or other suitable means. [Order 73-5, § 296-24-67003, filed 5/9/73 and Order 73-4, § 296-24-67003, filed 5/7/73.]

WAC 296-24-67005 Operation and maintenance. (1) In the absence of a firm foundation, the base of the jack shall be blocked. If there is a possibility of slippage of the cap, a block shall be placed in between the cap and the load.

(2) The operator shall watch the stop indicator, which shall be kept clean, in order to determine the limit of travel. The indicated limit shall not be overrun.

(3) After the load has been raised, it shall immediately be cribbed, blocked, or otherwise secured.

(4) Hydraulic jacks exposed to freezing temperatures shall be supplied with an adequate antifreeze liquid.

(5) All jacks shall be properly lubricated at regular intervals. The lubricating instructions of the manufacturer should be followed, and only lubricants recommended by him should be used.

(6) Each jack shall be thoroughly inspected at times which depend upon the service conditions. Inspections shall be not less frequent than the following:

(a) For constant or intermittent use at one locality, once every 6 months,

(b) For jacks sent out of shop for special work, when sent out and when returned,

(c) For a jack subjected to abnormal load or shock, immediately before and immediately thereafter.

(7) Repair or replacement parts shall be examined for possible defects.

(8) Jacks which are out of order shall be tagged accordingly, and shall not be used until repairs are made. [Order 73-5, § 296-24-67005, filed 5/9/73 and Order 73-4, § 296-24-67005, filed 5/7/73.]

Part H-2

SAFE PRACTICES OF ABRASIVE BLASTING OPERATIONS, VENTILATION

WAC

296-24-675	Safe practices of abrasive blasting operations.
296-24-67501	Purpose.
296-24-67503	Application.
296-24-67505	Selection of abrasives and equipment.
296-24-67507	Definitions.
296-24-67509	Dust hazards from abrasive blasting.
296-24-67511	Blast cleaning enclosures.
296-24-67513	Exhaust ventilation systems.
296-24-67515	Personal protective equipment.
296-24-67517	Air supply and air compressors.
296-24-67519	Operational procedures and general safety.
296-24-677	Ventilation.
296-24-67701	Scope.

WAC 296-24-675 Safe practices of abrasive blasting operations. [Order 73-5, § 296-24-675, filed 5/9/73 and Order 73-4, § 296-24-675, filed 5/7/73.]

WAC 296-24-67501 Purpose. The safety and health standards of this section are intended to protect health and to prevent injury to personnel engaged in abrasive blasting operations and to others working in the vicinity by:

(1) Control of dusts which are dispersed during abrasive blasting.

(2) Provision of an adequate amount of clean air to personnel.

(3) Protection of personnel from injury from flying particles or from moving equipment. [Order 73-5, § 296-24-67501, filed 5/9/73 and Order 73-4, § 296-24-67501, filed 5/7/73.]

WAC 296-24-67503 Application. This standard 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 this work is done without the aid of abrasives. [Order 73-5, § 296-24-67503, filed 5/9/73 and Order 73-4, § 296-24-67503, filed 5/7/73.]

WAC 296-24-67505 Selection of abrasives and equipment. Each type of abrasive and each type of equipment has its particular advantages in producing the quality of work desired, and the selection will depend on the specific requirements of the user. Therefore, no rule or suggestion can be given in this standard for the selection of a particular abrasive or of particular equipment. With properly designed equipment and proper operation and maintenance all types of abrasives and equipment can be used safely. However, abrasives which create the minimum hazard should be used wherever feasible. [Order 73-5, § 296-24-67505, filed 5/9/73 and Order 73-4, § 296-24-67505, filed 5/7/73.]

WAC 296-24-67507 Definitions. (1) Abrasive. A solid substance used in an abrasive blasting operation.

(2) Abrasive blasting. The forcible application of an abrasive to a surface by pneumatic pressure, hydraulic pressure, or centrifugal force.

(3) Abrasive-Blasting Respirator. A continuous flow airline respirator constructed so that it will cover the wearer's head, neck, and shoulders to protect him from rebounding abrasive.

(4) Air-Line Respirator. A device consisting of a face-piece, helmet, or hood to which clean air is supplied to the wearer through a small-diameter hose from a source not on the wearer's body.

(5) Blast Cleaning Barrel. 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.

(6) Blast Cleaning Room. 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.

(7) Blasting Cabinet. An enclosure where the operator stands outside and operates the blasting nozzle through an opening or openings in the enclosure.

(8) Clean Air. Air of such purity that it will not cause harm or discomfort to an individual if it is inhaled for extended periods of time.

(9) Dust Collector. A device or combination of devices for separating dust from the air handled by an exhaust ventilation system.

(10) Exhaust Ventilation System. A system for removing contaminated air from a space, comprising two or more of the elements; (a) enclosure or hood, (b) duct work, (c) dust collecting equipment, (d) exhauster, and (e) discharge stack.

(11) Particulate-Filter Respirator. 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.

(12) Respirable Dust. Airborne dust in sizes capable of passing through the upper respiratory system to reach the lower lung passages.

(13) Rotary Blast Cleaning Table. An enclosure where the pieces to be cleaned are positioned on a rotating table and are passed automatically through a series of blast sprays. [Order 73-5, § 296-24-67507, filed 5/9/73 and Order 73-4, § 296-24-67507, filed 5/7/73.]

WAC 296-24-67509 Dust hazards from abrasive blasting. (1) Dust Sources. 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.

(2) Types of Abrasives. A large variety of solid materials may be used as abrasives, with qualities varying from hard deep-cutting to soft polishing. These include;

(a) mineral grains, either synthetic or natural, (b) metallic shot or grit, generally of steel or chilled cast iron, and (c) organic abrasives, such as ground corncobs or walnut shells.

Silica sand is the most hazardous mineral abrasive commonly used and its use should be limited wherever possible.

The potential hazard from steel or iron dust is considered to be minimal.

Readily combustible organic abrasives may be pulverized fine enough to be capable of forming explosive mixtures with air.

(3) Types of Coatings. A surface coating formed during the fabrication of a part, or a protective coating applied after fabrication, will be removed and dispersed as a dust by abrasive blasting. The type of coating should be known to make a proper evaluation of the potential hazard.

(a) Silica sand is frequently imbedded in the surface of castings and may be pulverized by blast cleaning.

(b) Coatings containing toxic metals will add to the potential seriousness of the dust exposures. Examples of such coatings are anti-fouling paints containing mercury, lead paints on structural steel, cadmium plating, and lead deposits on pistons of internal combustion engines.

(c) Plastic or resin coatings may be decomposed by the action of the abrasives to form irritating by-products.

(4) Wet Abrasive Blasting. Wet methods will tend to keep dust exposures minimal, but droplets dispersed and dried residues which become airborne may create potential exposures.

(5) Concentrations of Contaminants. The concentration of respirable dust or fumes in the breathing zone of the abrasive-blasting operator or any other worker shall be kept below the levels recommended by chapter 296-62 WAC.

(6) Use of Combustible Abrasives. Organic abrasives which are combustible shall be used only in automatic systems because the fine dust produced presents a potential fire and explosion hazard.

(a) 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, Z 33.1-1961 (NFPA 91-1961; NBFU 91-1961), and American National Standard National Electrical Code, C1-1968 (NFPA 70-1968). The blast nozzle shall be bonded and grounded to prevent the buildup of static charges.

(b) 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. [Order 73-5, § 296-24-67509, filed 5/9/73 and Order 73-4, § 296-24-67509, filed 5/7/73.]

WAC 296-24-67511 Blast cleaning enclosures. (1) Blast Cleaning Enclosures. These include rotary blast cleaning tables, blast cleaning barrels and drums, abrasive blasting cabinets, blast cleaning rooms, abrasive separators, and similar enclosures.

(2) Ventilation. 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. (See WAC 296-24-677.)

(3) 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, not to exceed the allowable threshold limits as specified in Occupational Health Standards, chapter 296-62 WAC.

(4) The rate of exhaust shall be sufficient to provide prompt clearance of the dust-laden air within the enclosure after the cessation of blasting.

(5) 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 airborne dust particles within the enclosure.

(6) Observation Window. Safety glass protected by screening shall be used in observation windows, where hard deep-cutting abrasives are used.

(7) Access Openings. 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.

(8) Doors shall be flanged and tight when closed. [Order 73-5, § 296-24-67511, filed 5/9/73 and Order 73-4, § 296-24-67511, filed 5/7/73.]

WAC 296-24-67513 Exhaust ventilation systems.

(1) Exhaust Systems. The construction, installation, inspection, and maintenance of exhaust systems shall conform to the principles and requirements set forth in chapter 296-62 WAC.

(2) When dust leaks are noted, repairs shall be made.

(3) 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 conditions.

(4) Abrasive Separator. 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.

(5) Dust Collecting Equipment. The air exhausted from blast cleaning equipment shall be discharged through dust collecting equipment.

(6) Dust collectors shall be set up so that the accumulated dust can be emptied and removed without contaminating other working areas.

NOTE: Disposal of Waste. The fine dust from dry collectors should be emptied into and transported in enclosed containers to prevent dispersal of the fines, or discharged into a sluice with some method to assure wetting of the dust.

[Order 73-5, § 296-24-67513, filed 5/9/73 and Order 73-4, § 296-24-67513, filed 5/7/73.]

WAC 296-24-67515 Personal protective equipment.

(1) Abrasive-Blasting Respirators. Abrasive-blasting respirators shall be worn by all abrasive-blasting operators (a) when working inside of blast cleaning rooms, or (b) 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 (c) where concentrations of toxic dusts dispersed by the abrasive blasting may exceed the limits set in chapter 296-62 WAC.

(2) Particulate-filter respirators. Particulate-filter respirators, commonly referred to as dust-filter respirators, properly fitted, may be used for short, intermittent, or occasional dust exposures such as clean-up, 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.

(a) Dust-filter respirators shall not be used for continuous protection where silica sand is used as the blasting abrasive, or toxic materials are blasted.

(3) Personal Protective Clothing. Operators shall be equipped with heavy canvas or leather gloves and aprons or equivalent protection to protect them from the impact of abrasives. Safety shoes shall be worn where there is a hazard of foot injury.

(4) Personal protective clothing, equipment and their use shall comply with the provisions of WAC 296-24-07501, 296-24-07801, 296-24-08101 through 296-24-08113, 296-24-084, and 296-24-088. [Order 73-5, § 296-24-67515, filed 5/9/73 and Order 73-4, § 296-24-67515, filed 5/7/73.]

WAC 296-24-67517 Air supply and air compressors.

(1) Clean Air Supply. The air for abrasive-blasting respirators shall be free of harmful quantities of dusts, mists, or noxious gases, and shall meet the requirements for air purity set forth in American National Standard Z 9.2-1960.

NOTE: It is preferable to provide air for an abrasive-blasting respirator by means of low pressure blowers or compressors, which do not require internal organic lubricants and which are used solely for that purpose.

(a) When air from the regular compressed air line of the plant is used for the abrasive-blasting respirator the following shall be complied with: a trap and carbon filter will be installed and regularly maintained, to remove oil, water, scale, and odor; a pressure reducing diaphragm or valve will be installed to reduce the pressure down to requirements of the particular type of abrasive-blasting

respirator; and an automatic control will be provided to either sound an alarm or shut down the compressor in case of over-heating. [Order 73-5, § 296-24-67517, filed 5/9/73 and Order 73-4, § 296-24-67517, filed 5/7/73.]

WAC 296-24-67519 Operational procedures and general safety. (1) Housekeeping. Dusts 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, preferable by vacuum cleaning.

NOTE: Removal of dust accumulations from ledges and other dust catching surfaces should be done with a vacuum cleaner during a time when the plant is not in operation. The cleaning operator should wear a respirator approved for the existing conditions.

(a) Aisles and walkways shall be kept clear of steel shot or similar abrasive which may create a slipping hazard.

NOTE: Pressurized Tanks for Abrasive Supply. If a pressurized tank is used for an abrasive supply, it should be tied in with the manual control of the nozzle mentioned in WAC 296-24-65719(2) and the relief valve or opening on the tank should be located so as to be safely vented.

(2) Nozzles. Blast cleaning nozzle shall be equipped with an operating valve which must be held open manually. A support shall be provided on which the nozzle may be mounted when it is not in use.

(3) Tempered Air. If taken directly from the outside of the building, the air entering a blast cleaning room through the air supply inlets should be tempered during cold weather. [Order 73-5, § 296-24-67519, filed 5/9/73 and Order 73-4, § 296-24-67519, filed 5/7/73.]

WAC 296-24-677 Ventilation. [Order 73-5, § 296-24-677, filed 5/9/73 and Order 73-4, § 296-24-677, filed 5/7/73.]

WAC 296-24-67701 Scope. The applicable minimum requirements as specified in chapter 296-62 WAC relating to Ventilation and the following rules shall be complied with:

(1) Blast Cleaning Enclosures. 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.

(2) Inlet Baffled. Because of the wide variety of conditions, it is not possible to set rigid standards for rates of exhaust or for control velocities that will be suited to all types of enclosures and all types of work. In general, the use of free silica abrasives and the generation of toxic dusts in abrasive blasting require higher control velocities. With well designed equipment and excellent labyrinth baffling at openings it is possible to prevent

the escape of abrasives and dust with lower control velocities.

(3) Air Velocities. The performance of the equipment will be the final criterion and the exhaust ventilation must (a) keep the escape of dust from the enclosure to a minimum, (b) maintain a reasonable visibility in blast cleaning rooms and cabinets, and (c) provide for rapid clearance of the dust laden air within the enclosure to permit the enclosure to be opened. Experience has indicated control velocities that are needed to minimize the escape of dust from enclosures and these are given in the following subsections.

(4) Blast Cleaning Cabinet. The recommended inward air velocity at the hand openings is a minimum of 500 fpm calculated on the free opening without the curtains. The high control velocity is needed because the operator's working position is close to the openings.

(5) Rotary Blast Cleaning Tables. The access openings should be baffled with multiple slit-baffle curtains. The recommended inward air velocity at the access opening is 200 to 250 fpm calculated on the free opening without the curtains.

(6) Blast Cleaning Rooms. In blast cleaning rooms, the air inlets must be well baffled to prevent the escape of abrasive and the recommended inward air velocity at the air inlets is a minimum of 300 feet per minute.

(7) Abrasive Separators, Bucket Elevators, and Other Accessory Abrasive Handling Systems. The recommended inward air velocity at all openings is 200 to 250 fpm. [Order 73-5, § 296-24-67701, filed 5/9/73 and Order 73-4, § 296-24-67701, filed 5/7/73.]

Part I

WELDING, CUTTING AND BRAZING

WAC

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WAC 296-24-680 Welding, cutting, and brazing. [Order 73-5, § 296-24-680, filed 5/9/73 and Order 73-4, § 296-24-680, filed 5/7/73.]

WAC 296-24-68001 Definitions. (1) "Welder" and "welding operator" mean any operator of electric or gas welding and cutting equipment.

(2) "Approved" means listed or approved by a nationally recognized testing laboratory, such as Factory Mutual Engineering Corp., or Underwriters' Laboratories, Inc.

(3) All other welding terms are used in accordance with American Welding Society—Terms and Definitions—A3.0-1969. [Order 73-5, § 296-24-68001, filed 5/9/73 and Order 73-4, § 296-24-68001, filed 5/7/73.]

WAC 296-24-682 Installation and operation of oxygen fuel gas systems for welding and cutting. [Order 73-5, § 296-24-682, filed 5/9/73 and Order 73-4, § 296-24-682, filed 5/7/73.]

WAC 296-24-68201 General requirements. (1) Flammable Mixture. Mixtures of fuel gases and air or oxygen may be explosive and shall be guarded against. No device or attachment facilitating or permitting mixtures of air or oxygen with flammable gases prior to consumption, except at the burner or in a standard torch, shall be allowed unless approved for the purpose.

(2) Maximum Pressure. Under no condition shall acetylene be generated, piped (except in approved cylinder manifolds) or utilized at a pressure in excess of 15 p.s.i. gage pressure or 30 p.s.i. absolute pressure. (The 30 p.s.i. absolute pressure limit is intended to prevent unsafe use of acetylene in pressurized chambers such as caissons, underground excavations or tunnel construction.) This requirement does not apply to storage of acetylene dissolved in a suitable solvent in cylinders manufactured and maintained according to U.S. Department of Transportation requirements, or to acetylene for chemical use. The use of liquid acetylene shall be prohibited.

(3) Apparatus. Only approved apparatus such as torches, regulators or pressure-reducing valves, acetylene generators, and manifolds shall be used.

(4) Personnel. Workmen in charge of the oxygen or fuel-gas supply equipment, including generators, and oxygen or fuel-gas distribution piping systems shall be instructed and judged competent by their employers for this important work before being left in charge. Rules and instructions covering the operation and maintenance of oxygen or fuel-gas supply equipment including generators, and oxygen or fuel-gas distribution piping systems shall be readily available. [Order 73-5, § 296-24-68201, filed 5/9/73 and Order 73-4, § 296-24-68201, filed 5/7/73.]

WAC 296-24-68203 Cylinders and containers. (1) Approval and Marking. All portable cylinders used for the storage and shipment of compressed gases shall be constructed and maintained in accordance with the regulations of the U.S. Department of Transportation, 49 CFR Parts 171-179.

(a) Compressed gas cylinders shall be legibly marked, for the purpose of identifying the gas content, with either the chemical or the trade name of the gas. Such marking shall be by means of stenciling, stamping, or labeling, and shall not be readily removable. Whenever practical, the marking shall be located on the shoulder of the cylinder.

NOTE: This method conforms to the American National Standard Method for Marking Portable Compressed Gas Containers to Identify the Material Contained, ANSI Z 48.1-1954.

(b) Compressed gas cylinders shall be equipped with connections complying with the American National Standard Compressed Gas Cylinder Valve Outlet and Inlet Connections, ANSI B 57.1-1965.

(c) All cylinders with a water weight capacity of over 30 pounds shall be equipped with means of connecting a valve protection cap or with a collar or recess to protect the valve.

(2) Storage of Cylinders - General. (a) Cylinders shall be kept away from radiators and other sources of heat.

(b) Inside of buildings, cylinders shall be stored in a well-protected, well-ventilated, dry location, at least 20 feet from highly combustible materials such as oil or excelsior. Cylinders should be stored in definitely assigned places away from elevators, stairs, or gangways. Assigned storage spaces shall be located where cylinders will not be knocked over or damaged by passing or falling objects, or subject to tampering by unauthorized persons. Cylinders shall not be kept in unventilated enclosures such as lockers and cupboards.

(c) Empty cylinders shall have their valves closed.

(d) Valve protection caps, where cylinder is designed to accept a cap, shall always be in place, hand-tight, except when cylinders are in use or connected for use.

(3) Fuel-Gas Cylinder Storage. Inside a building, cylinders, except those in actual use or attached ready for use, shall be limited to a total gas capacity of 2,000 cubic feet or 300 pounds of liquefied petroleum gas.

(a) For storage in excess of 2,000 cubic feet total gas capacity of cylinders or 300 pounds of liquefied petroleum gas, a separate room or compartment conforming to the requirements specified in WAC 296-24-68211(6)(h) and (i) shall be provided, or cylinders shall be kept outside or in a special building. Special buildings, rooms or compartments shall have no open flame for heating or lighting and shall be well ventilated. They may also be used for storage of calcium carbide in quantities not to exceed 600 pounds, when contained in metal containers complying with WAC 296-24-68213(1)(a) and (b). Signs should be conspicuously posted in such rooms reading, "Danger—No Smoking, Matches or Open Lights", or other equivalent wording.

(b) Acetylene cylinders shall be stored valve end up.

(4) Oxygen Storage. (a) Oxygen cylinders shall not be stored near highly combustible material, especially oil and grease; or near reserve stocks of carbide and acetylene or other fuel-gas cylinders, or near any other substance likely to cause or accelerate fire; or in an acetylene generator compartment.

(b) Oxygen cylinders stored in outside generator houses shall be separated from the generator or carbide storage rooms by a noncombustible partition having a fire-resistance rating of at least 1 hour. This partition shall be without openings and shall be gastight.

(c) 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.

(d) Where a liquid oxygen system is to be used to supply gaseous oxygen for welding or cutting and the system has a storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 p.s.i.a. and 70°F.), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 p.s.i.a. and 70°F.), including unconnected reserves on hand at the site, it shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(5) Operating Procedures. (a) Cylinders, cylinder valves, couplings, regulators, hose, and apparatus shall be kept free from oily or greasy substances. Oxygen cylinders or apparatus shall not be handled with oily hands or gloves. A jet of oxygen must never be permitted to strike an oily surface, greasy clothes, or enter a fuel oil or other storage tank.

(b) When transporting cylinders by a crane or derrick, a cradle, boat, or suitable platform shall be used. Slings or electric magnets shall not be used for this purpose. Valve-protection caps, where cylinder is designed to accept a cap, shall always be in place.

(c) Cylinders shall not be dropped or struck or permitted to strike each other violently.

(d) 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 to the ground or otherwise fixed; the use of warm (not boiling) water is recommended. Valve-protection caps are designed to protect cylinder valves from damage.

(e) Unless cylinders are secured on a special truck, regulators shall be removed and valve-protection caps, when provided for, shall be put in place before cylinders are moved.

(f) Cylinders not having fixed hand wheels shall have keys, handles, or non-adjustable wrenches on valve stems while these cylinders are in service. In multiple cylinder installations only one key or handle is required for each manifold.

(g) Cylinder valves shall be closed before moving cylinders.

(h) Cylinder valves shall be closed when work is finished.

(i) Valves of empty cylinders shall be closed.

(j) 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, or fire-resistant shields shall be provided.

(k) Cylinders shall not be placed where they might become part of an electric circuit. Contacts with third rails, trolley wires, etc., shall be avoided. Cylinders shall be kept away from radiators, piping systems, layout tables, etc., that may be used for grounding electric circuits such as for arc welding machines. Any practice such as the tapping of an electrode against a cylinder to strike an arc shall be prohibited.

(l) Cylinders shall never be used as rollers or supports, whether full or empty.

(m) The numbers and markings stamped into cylinders shall not be tampered with.

(n) 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.

(o) No one shall tamper with safety devices in cylinders or valves.

(p) Cylinders shall not be dropped or otherwise roughly handled.

(q) Unless connected to a manifold, oxygen from a cylinder shall not be used without first attaching an oxygen regulator to the cylinder valve. Before connecting the regulator to the cylinder valve, the valve shall be opened slightly for an instant and then closed. (Always stand to one side of the outlet when opening the cylinder valve).

(r) A hammer or wrench shall not be used to open cylinder valves. If valves cannot be opened by hand, the supplier shall be notified.

(s) Cylinder valves shall not be tampered with nor should any attempt be made to repair them. If trouble is experienced, the supplier should be sent a report promptly indicating the character of the trouble and the cylinder's serial number. Supplier's instructions as to its disposition shall be followed.

(t) Complete removal of the stem from a diaphragm-type cylinder valve shall be avoided.

(u) Fuel-gas cylinders shall be placed with valve end up whenever they are in use. Liquefied gases shall be stored and shipped with the valve end up.

(v) Cylinders shall be handled carefully. Cylinders shall not be subjected to rough handling, knocks, or falls

which are liable to damage the cylinder, valve or safety devices and cause leakage.

(w) Before connecting a regulator to a cylinder valve, the valve shall be opened slightly and closed immediately. The valve shall be opened while standing to one side of the outlet; never in front of it. Fuel-gas cylinder valves shall not be cracked near other welding work or near sparks, flame, or other possible sources of ignition.

(x) Before a regulator is removed from a cylinder valve, the cylinder valve shall be closed and the gas released from the regulator.

(y) Nothing shall be placed on top of an acetylene cylinder when in use which may damage the safety device or interfere with the quick closing of the valve.

(z) If cylinders are found to have leaky valves or fittings which cannot be stopped by closing of the valve, the cylinders shall be taken outdoors away from sources of ignition and slowly emptied.

(al) A warning should be placed near cylinders having leaking fuse plugs or other leaking safety devices not to approach them with a lighted cigarette or other source of ignition. Such cylinders should be plainly tagged; the supplier should be promptly notified and his instructions followed as to their return.

(bl) Safety devices shall not be tampered with.

(cl) Fuel-gas shall not be used from cylinders through torches or other devices equipped with shutoff valves without reducing the pressure through a suitable regulator attached to the cylinder valve or manifold.

(dl) The cylinder valve shall always be opened slowly.

(el) An acetylene cylinder valve shall not be opened more than one and one-half (1 1/2) turns of the spindle, and preferably no more than three fourths (3/4) of a turn.

(fl) Where 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 quickly turned off in case of emergency. In the case of manifolded or coupled cylinders at least one such wrench shall always be available for immediate use.

(gl) When cylinders are transported by powered vehicle they shall be secured in a vertical position.

(hl) A suitable cylinder truck, chain, or other steady-ing device shall be used to prevent cylinders from being knocked over while in use. [Order 73-5, § 296-24-68203, filed 5/9/73 and Order 73-4, § 296-24-68203, filed 5/7/73.]

WAC 296-24-68205 Manifolding of cylinders. (1) Fuel-Gas Manifolds. (a) Manifolds shall be approved either separately for each component part or as an assembled unit.

(b) Except as provided in (1)(c) of this section fuel-gas cylinders connected to one manifold inside a building shall be limited to a total capacity not exceeding 300 pounds of liquefied petroleum gas or 3,000 cubic feet of other fuel-gas. More than one such manifold with connected cylinders may be located in the same room provided the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half (1/2) hour.

(c) Fuel-gas cylinders connected to one manifold having an aggregate capacity exceeding 300 pounds of liquefied petroleum gas or 3,000 cubic feet of other fuel-gas shall be located outdoors, or in a separate building or room constructed in accordance with WAC 296-24-68211(6)(h) and (i).

(d) Separate manifold buildings or rooms may also be used for the storage of drums of calcium carbide and cylinders containing fuel gases as provided in WAC 296-24-68203(3). Such buildings or rooms shall have no open flames for heating or lighting and shall be well-ventilated.

(e) High-pressure fuel-gas manifolds shall be provided with approved pressure regulating devices.

(2) High-Pressure Oxygen Manifolds (for use with cylinders having a Department of Transportation service pressure above 200 p.s.i.g.). (a) Manifolds shall be approved either separately for each component or as an assembled unit.

(b) Oxygen manifolds shall not be located in an acetylene generator room. Oxygen manifolds shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease), a minimum distance of 20 feet or by a non-combustible barrier at least 5 feet high having a fire-resistance rating of at least one-half (1/2) hour.

(c) Except as provided in WAC 296-24-68205(2)(d) oxygen cylinders connected to one manifold shall be limited to a total gas capacity of 6,000 cubic feet. More than one such manifold with connected cylinders may be located in the same room provided the manifolds are at least 50 feet apart or separated by a noncombustible barrier at least 5 feet high having a fire-resistance rating of at least one-half (1/2) hour.

(d) An oxygen manifold, to which cylinders having an aggregate capacity of more than 6,000 cubic feet of oxygen are connected, should be located outdoors or in a separate noncombustible building. Such a manifold, if located inside a building having other occupancy, shall be located in a separate room of noncombustible construction having a fire-resistance rating of at least one-half (1/2) hour or in an area with no combustible material within 20 feet of the manifold.

(e) An oxygen manifold or oxygen bulk supply system which has storage capacity of more than 13,000 cubic feet of oxygen (measured at 14.7 p.s.i.a. and 70°F.), connected in service or ready for service, or more than 25,000 cubic feet of oxygen (measured at 14.7 p.s.i.a. and 70°F.), including unconnected reserves on hand at the site, shall comply with the provisions of the Standard for Bulk Oxygen Systems at Consumer Sites, NFPA No. 566-1965.

(f) High-pressure oxygen manifolds shall be provided with approved pressure-regulating devices.

(3) Low-Pressure Oxygen Manifolds (for use with cylinders having a Department of Transportation service pressure not exceeding 200 p.s.i.g.). (a) Manifolds shall be of substantial construction suitable for use with oxygen at a pressure of 250 p.s.i.g. They shall have a minimum bursting pressure of 1,000 p.s.i.g. and shall be protected by a safety relief device which will relieve at a maximum pressure of 500 p.s.i.g.

NOTE: DOT-4L200 cylinders have safety devices which relieve at a maximum pressure of 250 p.s.i.g. (or 235 p.s.i.g. if vacuum insulation is used.

(b) Hose and hose connections subject to cylinder pressure shall comply with WAC 296-24-68209(5). Hose shall have a minimum bursting pressure of 1,000 p.s.i.g.

(c) The assembled manifold including leads shall be tested and proven gas-tight at a pressure of 300 p.s.i.g. The fluid used for testing oxygen manifolds shall be oil-free and not combustible.

(d) The location of manifolds shall comply with WAC 296-24-68205(2)(b), (c), (d) and (e).

(e) The following sign shall be conspicuously posted at each manifold:

Low-Pressure Manifold
Do Not Connect High-Pressure Cylinders
Maximum Pressure—250 P.S.I.G.

(4) Portable Outlet Headers. (a) Portable outlet headers shall not be used indoors except for temporary service where the conditions preclude a direct supply from outlets located on the service piping system.

(b) Each outlet on the service piping from which oxygen or fuel-gas is withdrawn to supply a portable outlet header shall be equipped with a readily accessible shut-off valve.

(c) Hose and hose connections used for connecting the portable outlet header to the service piping shall comply with WAC 296-24-68209(5).

(d) Master shutoff valves for both oxygen and fuel-gas shall be provided at the entry end of the portable outlet header.

(e) Portable outlet headers for fuel-gas service shall be provided with an approved hydraulic back-pressure valve installed at the inlet and preceding the service outlets, unless an approved pressure-reducing regulator, an approved backflow check valve, or an approved hydraulic back-pressure valve is installed at each outlet. Outlets provided on headers for oxygen service may be fitted for use with pressure-reducing regulators or for direct hose connection.

(f) Each service outlet on portable outlet headers shall be provided with a valve assembly that includes a detachable outlet seal cap, chained or otherwise attached to the body of the valve.

(g) Materials and fabrication procedures for portable outlet headers shall comply with WAC 296-24-68207(1), (2) and (5).

(h) Portable outlet headers shall be provided with frames which will support the equipment securely in the correct operating position and protect them from damage during handling and operation.

(5) Manifold Operating Procedures. (a) Cylinder manifolds shall be installed under the supervision of someone familiar with the proper practices with reference to their construction and use.

(b) All component parts used in the methods of manifold described in (1)(a) through (e) of this section shall be approved as to materials, design and construction either separately or as an assembled unit.

(c) All manifolds and parts used in methods of manifold shall be used only for the gas or gases for which they are approved.

(d) When acetylene cylinders are coupled, approved flash arresters shall be installed between each cylinder and the coupler block. For outdoor use only, and when the number of cylinders coupled does not exceed three, one flash arrester installed between the coupler block and regulator is acceptable.

(e) Each fuel-gas cylinder lead should be provided with a backflow check valve.

(f) The aggregate capacity of fuel-gas cylinders connected to a portable manifold inside a building shall not exceed 3,000 cubic feet of gas.

(g) Acetylene and liquefied fuel-gas cylinders shall be manifolded in a vertical position.

(h) The pressure in the gas cylinders connected to and discharged simultaneously through a common manifold shall be approximately equal. [Order 73-5, § 296-24-68205, filed 5/9/73 and Order 73-4, § 296-24-68205, filed 5/7/73.]

WAC 296-24-68207 Service piping systems. (1) Materials and Design. (a) Piping and fittings shall comply with Section 2, Industrial Gas and Air Piping Systems, of the American National Standard Code for Pressure Piping, ANSI B 31.1-1967, insofar as it does not conflict with WAC 296-24-68207(1)(b) and (c).

(b) Pipe shall be at least Schedule 40 and fittings shall be at least standard weight in sizes up to and including 6-inch nominal.

(c) Copper tubing shall be Types K or L in accordance with the Standard Specification for Seamless Copper Water Tube, ASTM B88-66a.

(d) Piping shall be steel, wrought iron, brass or copper pipe, or seamless copper, brass or stainless steel tubing, except as provided in WAC 296-24-68207(1)(e), (f), (g), (h) and (i).

(e) Oxygen piping and fittings at pressures in excess of 700 p.s.i.g., shall be stainless steel or copper alloys.

(f) Hose connections and hose complying with WAC 296-24-68209(5) may be used to connect the outlet of a manifold pressure regulator to piping providing the working pressure of the piping is 250 p.s.i.g. or less and the length of the hose does not exceed 5 feet. Hose shall have a minimum bursting pressure of 1,000 p.s.i.g.

(g) When oxygen is supplied to a service piping system from a low-pressure oxygen manifold without an intervening pressure regulating device, the piping system shall have a minimum design pressure of 250 p.s.i.g. A pressure regulating device shall be used at each station outlet when the connected equipment is for use at pressures less than 250 p.s.i.g.

(h) Piping for acetylene or acetylenic compounds shall be steel or wrought iron.

(i) Unalloyed copper shall not be used for acetylene or acetylenic compounds except in listed equipment.

(2) Piping Joints. (a) Joints in steel or wrought iron piping shall be welded, threaded or flanged. Fittings, such as ells, tees, couplings, and unions, may be rolled, forged or cast steel, maleable iron or nodular iron. Gray or white cast iron fittings are prohibited.

(b) Joints in brass or copper pipe shall be welded, brazed, threaded, or flanged. If of the socket type, they shall be brazed with silver-brazing alloy or similar high melting point (not less than 800°F.) filler metal.

(c) Joints in seamless copper, brass, or stainless steel tubing shall be approved gas tubing fittings or the joints shall be brazed. If of the socket type, they shall be brazed with silver-brazing alloy or similar high melting point (not less than 800°F.) filler metal.

(3) Installation. (a) Distribution lines shall be installed and maintained in a safe operating condition.

(b) Piping located inside or outside of buildings may be placed above or below ground. All piping shall be run as directly as practicable, protected against physical damage, proper allowance being made for expansion and contraction, jarring and vibration. Pipe laid underground in earth shall be located below the frost line and protected against corrosion. After assembly, piping shall be thoroughly blown out with air or nitrogen to remove foreign materials. For oxygen piping, only oil-free air, oil-free nitrogen, or oil-free carbon dioxide shall be used.

(c) Only piping which has been welded or brazed shall be installed in tunnels, trenches or ducts. Shutoff valves shall be located outside such conduits. Oxygen piping may be placed in the same tunnel, trench or duct with fuel-gas pipelines, provided there is good natural or forced ventilation.

(d) Low points in piping carrying moist gas shall be drained into drip pots constructed so as to permit pumping or draining out the condensate at necessary intervals. Drain valves shall be installed for this purpose having outlets normally closed with screw caps or plugs. No open end valves or petcocks shall be used, except that in drips located out of doors, underground, and not readily accessible, valves may be used at such points if they are equipped with means to secure them in the closed position. Pipes leading to the surface of the ground shall be cased or jacketed where necessary to prevent loosening or breaking.

(e) Gas cocks or valves shall be provided for all buildings at points where they will be readily accessible for shutting off the gas supply to these buildings in any emergency. Underground valve boxes or manholes should be avoided wherever possible. There shall also be provided a shutoff valve in the discharge line from the generator, gas holder, manifold or other source of supply.

(f) Shutoff valves shall not be installed in safety relief lines in such a manner that the safety relief device can be rendered ineffective.

(g) Fittings and lengths of pipe shall be examined internally before assembly and, if necessary, freed from scale or dirt. Oxygen piping and fittings shall be washed out with a suitable solution which will effectively remove grease and dirt but will not react with oxygen.

NOTE: Hot water solutions of caustic soda or trisodium phosphate are effective cleaning agents for this purpose.

(h) Piping shall be thoroughly blown out after assembly to remove foreign materials. For oxygen piping, oil-

free air, oil-free nitrogen, or oil-free carbon dioxide shall be used. For other piping, air or inert gas may be used.

(i) When flammable gas lines or other parts of equipment are being purged of air or gas, open lights or other sources of ignition shall not be permitted near uncapped openings.

(j) No welding or cutting shall be performed on an acetylene or oxygen pipeline, including the attachment of hangers or supports, until the line has been purged. Only oil-free air, oil-free nitrogen, or oil-free carbon dioxide shall be used to purge oxygen lines.

(4) Painting and Signs. (a) Underground pipe and tubing and outdoor ferrous pipe and tubing shall be covered or painted with a suitable material for protection against corrosion.

(b) Aboveground piping systems shall be marked in accordance with the American National Standard Scheme for the Identification of Piping Systems, ANSI A 13.1-1956.

(c) Station outlets shall be marked to indicate the name of the gas.

(5) Testing. (a) Piping systems shall be tested and proved gastight at 1 1/2 times the maximum operating pressure, and shall be thoroughly purged of air before being placed in service. The material used for testing oxygen lines shall be oil free and noncombustible. Flames shall not be used to detect leaks.

(b) When flammable gas lines or other parts of equipment are being purged of air or gas, sources of ignition shall not be permitted near uncapped openings. [Order 73-5, § 296-24-68207, filed 5/9/73 and Order 73-4, § 296-24-68207, filed 5/7/73.]

WAC 296-24-68209 Protective equipment, hose, and regulators. (1) General. Equipment shall be installed and used only in the service for which it is approved and as recommended by the manufacturer.

(2) Pressure Relief Devices. Service piping systems shall be protected by pressure relief devices set to function at not more than the design pressure of the systems and discharging upwards to a safe location.

(3) Piping Protective Equipment. (a) The fuel-gas and oxygen piping systems, including portable outlet headers shall incorporate the protective equipment shown in Figures Q-1, Q-2, and Q-3.

When only a portion of a fuel-gas system is to be used with oxygen, only that portion need comply with (3)(a) of this section.

(b) Approved protective equipment (designated P_F in Figs. Q-1, Q-2, and Q-3) shall be installed in fuel-gas piping to prevent:

(i) Backflow of oxygen into the fuel-gas supply system;

(ii) Passage of a flash back into the fuel-gas supply system; and

(iii) Excessive back pressure of oxygen in the fuel-gas supply system. The three functions of the protective equipment may be combined in one device or may be provided by separate devices.

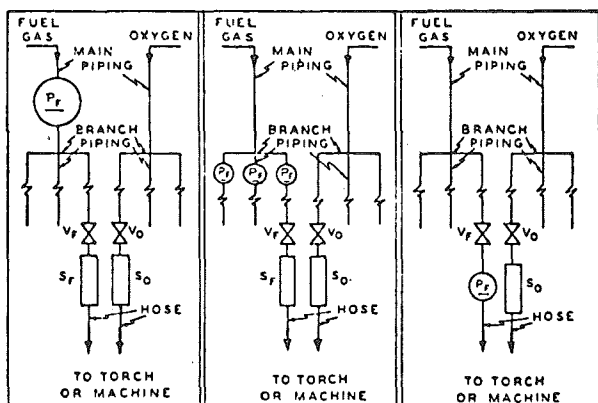


Fig. Q-1

Fig. Q-2

Fig. Q-3

LEGEND

- P_F —Protective equipment in fuel gas piping
 V_F —Fuel gas station outlet valve
 V_O —Oxygen station outlet valve
 S_F —Backflow prevention device(s) at fuel gas station outlet
 S_O —Backflow prevention device(s) at oxygen station outlet

(c) The protective equipment shall be located in the main supply line, as in Figure Q-1 or at the head of each branch line, as in Figure Q-2 or at each location where fuel-gas is withdrawn, as in Figure Q-3. Where branch lines are of 2-inch pipe size or larger or of substantial length, protective equipment (designated as P_F) shall be located as shown in either Q-2 and Q-3.

(d) Backflow protection shall be provided by an approved device that will prevent oxygen from flowing into the fuel-gas system or fuel from flowing into the oxygen system (see S_F , Figs. Q-1 and Q-2).

(e) Flash-back protection shall be provided by an approved device that will prevent flame from passing into the fuel-gas system.

(f) Back-pressure protection shall be provided by an approved pressure-relief device set at a pressure not greater than the pressure rating of the backflow or the flashback protection device, whichever is lower. The pressure-relief device shall be located on the downstream side of the backflow and flashback protection devices. The vent from the pressure-relief device shall be at least as large as the relief device inlet and shall be installed without low points that may collect moisture. If low points are unavoidable, drip pots with drains closed with screw plugs or caps shall be installed at the low points. The vent terminus shall not endanger personnel or property through gas discharge; shall be located away from ignition sources; and shall terminate in a hood or bend.

(g) If pipeline protective equipment incorporates a liquid, the liquid level shall be maintained, and a suitable anti-freeze may be used to prevent freezing.

(h) Fuel gas for use with equipment not requiring oxygen shall be withdrawn upstream of the piping protective devices.

(4) Station Outlet Protective Equipment. (a) A check valve pressure regulator, hydraulic seal, or combination of these devices shall be provided at each station outlet, including those on portable headers, to prevent backflow, as shown in Figures Q-1, Q-2, and Q-3 and designated as S_F and S_O .

(b) When approved pipeline protective equipment (designated P_F) is located at the station outlet as in Figure Q-3, no additional check valve, pressure regulator, or hydraulic seal is required.

(c) A shutoff valve (designated V_F and V_O) shall be installed at each station outlet and shall be located on the upstream side of other station outlet equipment.

(d) If the station outlet is equipped with a detachable regulator, the outlet shall terminate in a union connection that complies with the Regulator Connection Standards, 1958, Compressed Gas Association.

(e) If the station outlet is connected directly to a hose, the outlet shall terminate in a union connection complying with the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(f) Station outlets may terminate in pipe threads to which permanent connections are to be made, such as to a machine.

(g) Station outlets shall be equipped with a detachable outlet seal cap secured in place. This cap shall be used to seal the outlet except when a hose, a regulator, or piping is attached.

(h) Where station outlets are equipped with approved backflow and flashback protective devices, as many as four torches may be supplied from one station outlet through rigid piping, provided each outlet from such piping, is equipped with a shutoff valve and provided the fuel-gas capacity of any one torch does not exceed 15 cubic feet per hour. This rule does not apply to machines.

(5) Hose and Hose Connections. (a) Hose for oxy-fuel gas service shall comply with the Specification for Rubber Welding Hose, 1958, Compressed Gas Association and Rubber Manufacturers Association.

(b) The generally recognized colors are red for acetylene and other fuel-gas hose, green for oxygen hose, and black for inert-gas and air hose.

(c) When parallel lengths of oxygen and acetylene hose are taped together for convenience and to prevent tangling, not more than 4 inches out of 12 inches shall be covered by tape.

(d) Hose connections shall comply with the Standard Hose Connection Specifications, 1957, Compressed Gas Association.

(e) Hose connections shall be clamped or otherwise securely fastened in a manner that will withstand, without leakage, twice the pressure to which they are normally subjected in service, but in no case less than a pressure of 300 p.s.i. Oil-free air or an oil-free inert gas shall be used for the test.

(f) Hose showing leaks, burns, worn places, or other defects rendering it unfit for service shall be repaired or replaced.

(6) Pressure-Reducing Regulators. (a) Pressure-reducing regulators shall be used only for the gas and pressures for which they are intended. The regulator inlet connections shall comply with Regulator Connection Standards, 1958, Compressed Gas Association.

(b) When regulators or parts of regulators, including gages, need repair, the work shall be performed by skilled mechanics who have been properly instructed.

(c) Gages on oxygen regulators shall be marked "USE NO OIL".

(d) Union nuts and connections on regulators shall be inspected before use to detect faulty seats which may cause leakage of gas when the regulators are attached to the cylinder valves. Damaged nuts or connections shall be destroyed. [Order 73-5, § 296-24-68209, filed 5/9/73 and Order 73-4, § 296-24-68209, filed 5/7/73.]

WAC 296-24-68211 Acetylene generators. (1) Approval and Marking. (a) Generators shall be of approved construction and shall be plainly marked with the maximum rate of acetylene in cubic feet per hour for which they are designed; the weight and size of carbide necessary for a single charge; the manufacturer's name and address; and the name or number of the type of generator.

(b) Carbide shall be of the size marked on the generator nameplate.

(2) Rating and Pressure Limitations. (a) The total hourly output of a generator shall not exceed the rate for which it is approved and marked. Unless specifically approved for higher ratings, carbide-feed generators shall be rated at 1 cubic foot per hour per pound of carbide required for a single complete charge.

(b) Relief valves shall be regularly operated to insure proper functioning. Relief valves for generating chambers shall be set to open at a pressure not in excess of 15 p.s.i.g. Relief valves for hydraulic back pressure valves shall be set to open at a pressure not in excess of 20 p.s.i.g.

(c) Nonautomatic generators shall not be used for generating acetylene at pressures exceeding 1 p.s.i.g., and all water overflows shall be visible.

(3) Location. The space around the generator shall be ample for free, unobstructed operation and maintenance and shall permit ready adjustment and charging.

(4) Stationary Acetylene Generators (automatic and nonautomatic). (a) The foundation shall be so arranged that the generator will be level and so that no excessive strain will be placed on the generator or its connections. Acetylene generators shall be grounded.

(b) Generators shall be placed where water will not freeze. The use of common salt (sodium chloride) or other corrosive chemicals for protection against freezing is not permitted. (For heating systems see WAC 296-24-68211(6)(k).)

(c) Except when generators are prepared in accordance with WAC 296-24-68211(7)(i), sources of ignition

shall be prohibited in outside generator houses or inside generator rooms.

(d) Water shall not be supplied through a continuous connection to the generator except when the generator is provided with an adequate open overflow or automatic water shutoff which will effectively prevent overfilling of the generator. Where a noncontinuous connection is used, the supply line shall terminate at a point not less than 2 inches above the regularly provided opening for filling so that the water can be observed as it enters the generator.

(e) Unless otherwise specifically approved, generators shall not be fitted with continuous drain connections leading to sewers, but shall discharge through an open connection into a suitably vented outdoor receptacle or residue pit which may have such connections. An open connection for the sludge drawoff is desirable to enable the generator operator to observe leakage of generating water from the drain valve or sludge cock.

(f) Each generator shall be provided with a vent pipe of Schedule 40 galvanized iron or steel, except that outside of buildings, vent pipes larger than 4 inches in diameter may be not less than 14 gage galvanized tubing or sheet steel.

(g) The escape or relief pipe shall be rigidly installed without traps and so that any condensation will drain back to the generator.

(h) The escape or relief pipe shall be carried full size to a suitable point outside the building. It shall terminate in a hood or bend located at least 12 feet above the ground, preferably above the roof, and as far away as practicable from windows or other openings into buildings and as far away as practicable from sources of ignition such as flues or chimneys and tracks used by locomotives. Generating chamber relief pipes shall not be inter-connected but shall be separately led to the outside air. The hood or bend shall be so constructed that it will not be obstructed by rain, snow, ice, insects, or birds. The outlet shall be at least 3 feet from combustible construction.

(i) Gas holders shall be constructed on the gasometer principle, the bell being suitably guided. The gas bell shall move freely without tendency to bind and shall have a clearance of at least 2 inches from the shell.

(j) The gas holder may be located in the generator room, in a separate room or out of doors. In order to prevent collapse of the gas bell or infiltration of air due to a vacuum caused by the compressor or booster pump or cooling of the gas, a compressor or booster cutoff shall be provided at a point 12 inches or more above the landing point of the bell. When the gas holder is located indoors, the room shall be ventilated in accordance with WAC 296-24-68211(6)(j) and heated and lighted in accordance with WAC 296-24-68211(6)(k) and (1).

(k) When the gas holder is not located within a heated building, gas holder seals shall be protected against freezing.

(l) Means shall be provided to stop the generator-feeding mechanism before the gas holder reaches the upper limit of its travel.

(m) When the gas holder is connected to only one generator, the gas capacity of the holder shall be not less than one-third of the hourly rating of the generator.

(n) If acetylene is used from the gas holder without increase in pressure at some points but with increase in pressure by a compressor or booster pump at other points, approved piping protective devices shall be installed in each supply line. The low-pressure protective device shall be located between the gas holder and the shop piping, and the medium-pressure protective device shall be located between the compressor or booster pump and the shop piping (see Figure Q-4). Approved protective equipment (designated P_F) is used to prevent: Backflow of oxygen into the fuel-gas supply system; passage of a flashback into the fuel-gas supply system; and excessive back pressure of oxygen in the fuel-gas supply system. The three functions of the protective equipment may be combined in one device or may be provided by separate devices.

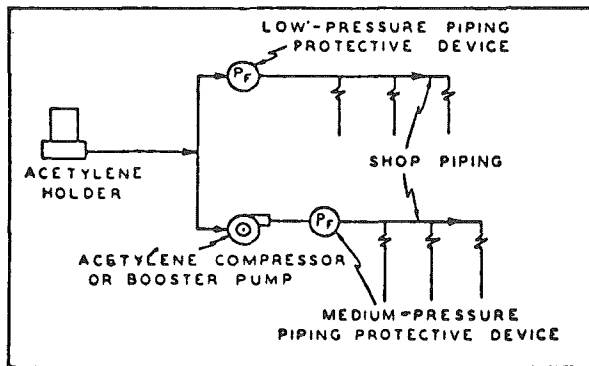


FIGURE Q-4

(o) The compressor or booster system shall be of an approved type.

(p) Wiring and electrical equipment in compressor or booster pump rooms or enclosures shall conform to the provisions of the National Electrical Code, Part 5, NFPA-1971, article 501, (ANSI-C 1-1971) for Class I, Division 2 locations.

(q) Compressors and booster pump equipment shall be located in well-ventilated areas away from open flames, electrical or mechanical sparks, or other ignition sources.

(r) Compressor or booster pumps shall be provided with pressure relief valves which will relieve pressure exceeding 15 p.s.i.g. to a safe outdoor location as provided in WAC 296-24-68211(2)(b), or by returning the gas to the inlet side or to the gas supply source.

(s) Compressor or booster pump discharge outlets shall be provided with approved protective equipment. (See WAC 296-24-68211(4)(e)).

(5) Portable Acetylene Generators. (a) All portable generators shall be of a type approved for portable use.

(b) Portable generators shall not be used within 10 feet of combustible material other than the floor.

(c) Portable generators shall not be used in rooms of total volume less than 35 times the total gas-generating

capacity per charge of all generators in the room. Generators shall not be used in rooms having a ceiling height of less than 10 feet. (To obtain the gas-generating capacity in cubic feet per charge, multiply the pounds of carbide per charge by 4.5).

(d) Portable generators shall be protected against freezing. The use of salt or other corrosive chemical to prevent freezing is prohibited.

(e) Portable generators shall be cleaned and recharged and the air mixture blown off outside buildings.

(f) When charged with carbide, portable generators shall not be moved by crane or derrick.

(g) When not in use, portable generators shall not be stored in rooms in which open flames are used unless the generators contain no carbide and have been thoroughly purged of acetylene. Storage rooms shall be well ventilated.

(h) When portable acetylene generators are to be transported and operated on vehicles, they shall be securely anchored to the vehicles. If transported by truck, the motor shall be turned off during charging, cleaning, and generating periods.

(i) Portable generators shall be located at a safe distance from the welding position so that they will not be exposed to sparks, slag, or misdirection of the torch flame or overheating from hot materials or processes.

(6) Outside Generator Houses and Inside Generator Rooms for Stationary Acetylene Generators. (a) No opening in any outside generator house shall be located within 5 feet of any opening in another building.

(b) Walls, floors and roofs of outside generator houses shall be of noncombustible construction.

(c) When a part of the generator house is to be used for the storage or manifold of oxygen cylinders, the space to be so occupied shall be separated from the generator carbide storage section by partition walls continuous from floor to roof or ceiling, of the type of construction stated in WAC 296-24-68211(6)(h). Such separation walls shall be without openings and shall be joined to the floor, other walls and ceiling or roof in a manner to effect a permanent gas-tight joint.

(d) Exit doors shall be located so as to be readily accessible in case of emergency.

(e) Explosion venting for outside generator houses and inside generator rooms shall be provided in exterior walls or roofs. The venting areas shall be equal to not less than 1 square foot per 50 cubic feet of room volume and may consist of any one or any combination of the following: Walls of light, noncombustible material preferably single-thickness, single-strength glass; lightly fastened hatch covers; lightly fastened swinging doors in exterior walls opening outward; lightly fastened walls or roof designed to relieve at a maximum pressure of 25 pounds per square foot.

(f) The installation of acetylene generators within buildings shall be restricted to buildings not exceeding one story in height: *Provided, however,* That this will not be construed as prohibiting such installations on the roof or top floor of a building exceeding such height.

(g) Generators installed inside buildings shall be enclosed in a separate room of ample size.

(h) The walls, partitions, floors, and ceilings of inside generator rooms shall be of noncombustible construction having a fire-resistance rating of at least 1 hour. The walls or partitions shall be continuous from floor to ceiling and shall be securely anchored. At least one wall of the room shall be an exterior wall.

(i) Openings from an inside generator room to other parts of the building shall be protected by a swinging type, self-closing fire door for a Class B opening and having a rating of at least 1 hour. Windows in partitions shall be wired glass and approved metal frames with fixed sash. Installation shall be in accordance with the Standard for the Installation of Fire Doors and Windows, NFPA 80-1970.

(j) Inside generator rooms or outside generator houses shall be well ventilated with vents located at floor and ceiling levels.

(k) Heating shall be by steam, hot water, enclosed electrically heated elements or other indirect means. Heating by flames or fires shall be prohibited in outside generator houses or inside generator rooms, or in any enclosure communicating with them.

(l) Generator houses or rooms shall have natural light during daylight hours. Where artificial lighting is necessary it shall be restricted to electric lamps installed in a fixed position. Unless specifically approved for use in atmospheres containing acetylene, such lamps shall be provided with enclosures of glass or other noncombustible material so designed and constructed as to prevent gas vapors from reaching the lamp or socket and to resist breakage. Rigid conduit with threaded connections shall be used.

(m) Lamps installed outside of wired-glass panels set in gas-tight frames in the exterior walls or roof of the generator house or room are acceptable.

(n) Electric switches, telephones, and all other electrical apparatus which may cause a spark, unless specifically approved for use inside acetylene generator rooms, shall be located outside the generator house or in a room or space separated from the generator room by a gas-tight partition, except that where the generator system is designed so that no carbide fill opening or other part of the generator is open to the generator house or room during the operation of the generator, and so that residue is carried in closed piping from the residue discharge valve to a point outside the generator house or room, electrical equipment in the generator house or room shall conform to the provisions of the National Electrical Code, Part 5, NFPA-1971, article 501, (ANSI-C 1-1971) for Class I, Division 2 locations.

(7) Maintenance and Operation. (a) Unauthorized persons shall not be permitted in outside generator houses or inside generator rooms.

(b) Operating instructions shall be posted in a conspicuous place near the generator or kept in a suitable place available for ready reference.

(c) When recharging generators the order of operations specified in the instructions supplied by the manufacturer shall be followed.

(d) In the case of batch-type generators, when the charge of carbide is exhausted and before additional carbide is added, the generating chamber shall always be

flushed out with water, renewing the water supply in accordance with the instruction card furnished by the manufacturer.

(e) The water-carbide residue mixture drained from the generator shall not be discharged into sewer pipes or stored in areas near open flames. Clear water from residue settling pits may be discharged into sewer pipes.

(f) The carbide added each time the generator is recharged shall be sufficient to refill the space provided for carbide without ramming the charge. Steel or other ferrous tools shall not be used in distributing the charge.

(g) Generator water chambers shall be kept filled to proper level at all times except while draining during the recharging operation.

(h) Whenever repairs are to be made or the generator is to be charged or carbide is to be removed, the water chamber shall be filled to the proper level.

(i) Previous to making repairs involving welding, soldering, or other hot work or other operations which produce a source of ignition, the carbide charge and feed mechanism shall be completely removed. All acetylene shall be expelled by completely flooding the generator shell with water and the generator shall be disconnected from the piping system. The generator shall be kept filled with water, if possible, or positioned to hold as much water as possible.

(j) Hot repairs shall not be made in a room where there are other generators unless all the generators and piping have been purged of acetylene. Hot repairs should preferably be made out of doors. [Order 73-5, § 296-24-68211, filed 5/9/73 and Order 73-4, § 296-24-68211, filed 5/7/73.]

WAC 296-24-68213 Calcium carbide storage. (1) Packaging. (a) Calcium carbide shall be contained in metal packages of sufficient strength to prevent rupture. The packages shall be provided with a screw top or equivalent. These packages shall be constructed water- and air-tight. Solder shall not be used in such a manner that the package will fail if exposed to fire.

(b) Packages containing calcium carbide shall be conspicuously marked "Calcium Carbide-Dangerous If Not Kept Dry" or with equivalent warning.

(c) Caution: Metal tools, even the so-called spark resistant type may cause ignition of an acetylene and air mixture when opening carbide containers.

(d) Sprinkler systems shall not be installed in carbide storage rooms.

(2) Storage Indoors. (a) Calcium carbide in quantities not to exceed 600 pounds may be stored indoors in dry, waterproof, and well-ventilated locations.

(b) Calcium carbide not exceeding 600 pounds may be stored indoors in the same room with fuel-gas cylinders.

(c) Packages of calcium carbide, except for one of each size, shall be kept sealed. The seals shall not be broken when there is carbide in excess of 1 pound in any other unsealed package of the same size of carbide in the room.

(d) Calcium carbide exceeding 600 pounds but not exceeding 5,000 pounds shall be stored:

(i) In accordance with (2)(e) of this section.

(ii) In an inside generator room or outside generator house; or

(iii) In a separate room in a one-story building which may contain other occupancies, but without cellar or basement beneath the carbide storage section. Such rooms shall be constructed in accordance with WAC 296-24-68211(6)(h) and (i) and ventilated in accordance with WAC 296-24-68211(6)(j). These rooms shall be used for no other purpose.

(e) Calcium carbide in excess of 5,000 pounds shall be stored in one-story buildings without cellar or basement and used for no other purpose, or in outside generator houses. The location of such storage buildings shall be away from congested mercantile and manufacturing districts. If the storage building is of noncombustible construction, it may adjoin other one-story buildings if separated therefrom by unpierced firewalls; if it is detached less than 10 feet from such building or buildings, there shall be no opening in any of the mutually exposing sides of such buildings within 10 feet. If the storage building is of combustible construction, it shall be at least 20 feet from any other one- or two-story building, and at least 30 feet from any other building exceeding two stories.

(3) Storage Outdoors. (a) Calcium carbide in unopened metal containers may be stored outdoors.

(b) Carbide containers to be stored outdoors shall be examined to make sure that they are airtight and watertight. Periodic reexaminations shall be made for rusting or other damage to a container that might affect its water or air tightness.

(c) The bottom tier of each row shall be placed on wooden planking or equivalent so that the containers will not come in contact with the ground or ground water.

(d) Storage areas shall be at least 10 feet from lines of adjoining property that may be built upon.

(e) Containers of carbide which have been in storage the longest shall be used first. [Order 73-5, § 296-24-68213, filed 5/9/73 and Order 73-4, § 296-24-68213, filed 5/7/73.]

WAC 296-24-68215 Public exhibitions and demonstrations. (1) Installation Requirements. Installation and operation of welding, cutting, and related equipment shall be done by, or under the supervision of, a competent operator to insure the personal protection of viewers and demonstrators as well as the protection from fire, of materials in and around the site and the building itself.

(2) Procedures. (a) Cylinders containing compressed gases for use at the site shall not be charged in excess of one-half (1/2) their maximum permissible content. (Cylinders of nonliquefied gases and acetylene shall be charged to not more than one-half (1/2) their maximum permissible charged pressure in p.s.i.g. Cylinders of liquefied gases shall be charged to not more than one-half (1/2) the maximum permissible capacity in pounds.)

(b) Cylinders located at the site shall be connected for use except that enough additional cylinders may be stored at the site to furnish approximately 1 day's consumption of each gas used. Other cylinders shall be stored, in an approved storage area, preferably outdoors,

but this storage area shall not be located near a building exit.

(c) Cylinders in excess of 40 pounds total weight being transported to or from the site shall be carried on a hand or motorized truck.

(d) The site shall be constructed, equipped, and operated in such a manner that the demonstration will be carried out so as to minimize the possibility of injury to viewers.

(e) Sites involving the use of compressed gases shall be located so as not to interfere with the egress of people during an emergency.

(f) The fire department shall be notified in advance of such use of the site.

(g) Each site shall be provided with a portable fire extinguisher of appropriate size and type and with a pail of water.

(h) The public and combustible materials at the site shall be protected from flames, sparks, and molten metal.

(i) Hoses shall be located and protected so that they will not be physically damaged.

(j) Cylinder valves shall be closed when equipment is unattended.

(k) Where caps are provided for valve protection, such caps shall be in place except when the cylinders are in service or connected ready for service.

(l) Cylinders shall be located or secured so that they cannot be knocked over. [Order 73-5, § 296-24-68215, filed 5/9/73 and Order 73-4, § 296-24-68215, filed 5/7/73.]

WAC 296-24-685 Application, installation, and operation of arc welding and cutting equipment. [Order 73-5, § 296-24-685, filed 5/9/73 and Order 73-4, § 296-24-685, filed 5/7/73.]

WAC 296-24-68501 General. (1) Equipment Selection. Welding equipment shall be chosen for safe application to the work to be done as specified in WAC 296-24-68503.

(2) Installation. Welding equipment shall be installed safely as specified by WAC 296-24-68505.

(3) Instruction. Workmen designated to operate arc welding equipment shall have been properly instructed and qualified to operate such equipment as specified in WAC 296-24-68507. [Order 73-5, § 296-24-68501, filed 5/9/73 and Order 73-4, § 296-24-68501, filed 5/7/73.]

WAC 296-24-68503 Application of arc welding equipment.

NOTE: Assurance of consideration of safety in design is obtainable by choosing apparatus complying with the Requirements for Electric Arc-Welding Apparatus, NEMA EW-1-1962, National Electrical Manufacturers Association or the Safety Standard for Transformer-Type Arc-Welding Machines, ANSI C33.2-1956, Underwriters' Laboratories.

(1) Environmental Conditions. (a) Standard machines for arc welding service shall be designed and constructed to carry their rated load with rated temperature rises where the temperature of the cooling air does not exceed 40°C. (104°F.) and where the altitude does not exceed 3,300 feet, and shall be suitable for operation in atmospheres containing gases, dust, and light rays produced by the welding arc.

(b) Unusual service conditions may exist, and in such circumstances machines shall be especially designed to safely meet the requirements of the service. Chief among these conditions are exposure to:

- (i) Unusually corrosive fumes.
- (ii) Steam or excessive humidity.
- (iii) Excessive oil vapor.
- (iv) Flammable gases.
- (v) Abnormal vibration or shock.
- (vi) Excessive dust.
- (vii) Weather.
- (viii) Unusual seacoast or shipboard conditions.

(2) Voltage. Open circuit (No Load) voltages of arc welding and cutting machines should be as low as possible consistent with satisfactory welding or cutting being done. The following limits shall not be exceeded:

- (a) Alternating-current machines.
 - (i) Manual arc welding and cutting—80 volts.
 - (ii) Automatic (machine or mechanized) arc welding and cutting—100 volts.
- (b) Direct-current machines.
 - (i) Manual arc welding and cutting—100 volts.
 - (ii) Automatic (machine or mechanized) arc welding and cutting—100 volts.

(c) When special welding and cutting processes require values of open circuit voltages higher than the above, means shall be provided to prevent the operator from making accidental contact with the high voltage by adequate insulation or other means.

NOTE: For a.c. welding under wet conditions or warm surroundings where perspiration is a factor, the use of reliable automatic controls for reducing no load voltage is recommended to reduce the shock hazard.

(3) Design. (a) A controller integrally mounted in an electric motor driven welder shall have capacity for carrying rated motor current, shall be capable of making and interrupting stalled rotor current of the motor, and may serve as the running overcurrent device if provided with the number of over-current units as specified by the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971). Starters with magnetic undervoltage release should be used with machines installed more than one to a circuit to prevent circuit overload caused by simultaneously starting of several motors upon return of voltage.

(b) On all types of arc welding machines, control apparatus shall be enclosed except for the operating wheels, levers, or handles.

NOTE: Control handles and wheels should be large enough to be easily grasped by a gloved hand.

(c) Input power terminals, tap change devices and live metal parts connected to input circuits shall be completely enclosed and accessible only by means of tools.

(d) Terminals for welding leads should be protected from accidental electrical contact by employees or by metal objects i.e., vehicles, crane hooks, etc. Protection may be obtained by use of: Dead-front receptacles for plug connections; recessed openings with nonremovable hinged covers; heavy insulating sleeving or taping or other equivalent electrical and mechanical protection. If a welding lead terminal which is intended to be used exclusively for connection to the work is connected to the grounded enclosure, it must be done by a conductor at least two AWG sizes smaller than the grounding conductor and the terminal shall be marked to indicate that it is grounded.

(e) No connections for portable control devices such as push buttons to be carried by the operator shall be connected to an a.c. circuit of higher than 120 volts. Exposed metal parts of portable control devices operating on circuits above 50 volts shall be grounded by a grounding conductor in the control cable.

(f) Auto transformers or a.c. reactors shall not be used to draw welding current directly from any a.c. power source having a voltage exceeding 80 volts. [Order 73-5, § 296-24-68503, filed 5/9/73 and Order 73-4, § 296-24-68503, filed 5/7/73.]

WAC 296-24-68505 Installation of arc welding equipment. (1) General. Installation including power supply shall be in accordance with the requirements of the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971).

(2) Grounding. (a) The frame or case of the welding machine (except engine-driven machines) shall be grounded under the conditions and according to the methods prescribed in National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971).

(b) Conduits containing electrical conductors shall not be used for completing a work-lead circuit. Pipelines shall not be used as a permanent part of a work-lead circuit, but may be used during construction, extension or repair providing current is not carried through threaded joints, flanged bolted joints, or caulked joints and that special precautions are used to avoid sparking at connection of the work-lead cable.

(c) Chains, wire ropes, cranes, hoists, and elevators shall not be used to carry welding current.

(d) Where a structure, conveyor, or fixture is regularly employed as a welding current return circuit, joints shall be bonded or provided with adequate current collecting devices and appropriate periodic inspection should be conducted to ascertain that no condition of electrolysis or shock, or fire hazard exists by virtue of such use.

(e) All ground connections shall be checked to determine that they are mechanically strong and electrically adequate for the required current.

(3) Supply Connections and Conductors. (a) A disconnecting switch or controller shall be provided at or near each welding machine which is not equipped with such a switch or controller mounted as an integral part

of the machine. The switch shall be in accordance with the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971). Overcurrent protection shall be provided as specified in the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971). A disconnect switch with overload protection or equivalent disconnect and protection means, permitted by the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971) shall be provided for each outlet intended for connection to a portable welding machine.

(b) For individual welding machines, the rated current-carrying capacity of the supply conductors shall be not less than the rated primary current of the welding machines.

(c) For groups of welding machines, the rated current-carrying capacity of conductors may be less than the sum of the rated primary currents of the welding machines supplied. The conductor rating shall be determined in each case according to the machine loading based on the use to be made of each welding machine and the allowance permissible in the event that all the welding machines supplied by the conductors will not be in use at the same time.

(d) In operations involving several welders on one structure, d.c. welding process requirements may require the use of both polarities; or supply circuit limitations for a.c. welding may require distribution of machines among the phases of the supply circuit. In such cases no load voltages between electrode holders will be 2 times normal in d.c. or 1, 1.4, 1.73, or 2 times normal on a.c. machines. Similar voltage differences will exist if both a.c. and d.c. welding are done on the same structure.

(i) All d.c. machines shall be connected with the same polarity.

(ii) All a.c. machines shall be connected to the same phase of the supply circuit and with the same instantaneous polarity. [Order 73-5, § 296-24-68505, filed 5/9/73 and Order 73-4, § 296-24-68505, filed 5/7/73.]

WAC 296-24-68507 Operation and maintenance.

(1) General. Workmen assigned to operate or maintain arc welding equipment shall be acquainted with the requirements of WAC 296-24-68501 through WAC 296-24-68505, WAC 296-24-69501 through WAC 296-24-69507, WAC 296-24-70001 through WAC 296-24-70007 and WAC 296-24-71501 through WAC 296-24-71525; if doing gas-shielded arc welding, also Recommended Safe Practices for Gas-Shielded Arc Welding, A6.1-1966, American Welding Society.

(2) Machine Hook Up. Before starting operations all connections to the machine shall be checked to make certain they are properly made. The work lead shall be firmly attached to the work; magnetic work clamps shall be freed from adherent metal particles of spatter on contact surfaces. Coiled welding cable shall be spread out before use to avoid serious overheating and damage to insulation.

(3) Grounding. Grounding of the welding machine frame shall be checked. Special attention shall be given to safety ground connections of portable machines.

(4) Leaks. There shall be no leaks of cooling water, shielding gas or engine fuel.

(5) Switches. It shall be determined that proper switching equipment for shutting down the machine is provided.

(6) Manufacturers' Instructions. Printed rules and instructions covering operation of equipment supplied by the manufacturers shall be strictly followed.

(7) Electrode Holders. Electrode holders when not in use shall be so placed that they cannot make electrical contact with persons, conducting objects, fuel or compressed gas tanks.

(8) Electric Shock. Cables with splices within 10 feet of the holder shall not be used. The welder should not coil or loop welding electrode cable around parts of his body.

(9) Maintenance. (a) The operator should report any equipment defect or safety hazard to his supervisor and the use of the equipment shall be discontinued until its safety has been assured. Repairs shall be made only by qualified personnel.

(b) Machines which have become wet shall be thoroughly dried and tested before being used.

(c) Work and electrode lead cables should be frequently inspected for wear and damage. Cables with damaged insulation or exposed bare conductors shall be replaced. Joining lengths of work and electrode cables shall be done by the use of connecting means specifically intended for the purpose. The connecting means shall have insulation adequate for the service conditions. [Order 73-5, § 296-24-68507, filed 5/9/73 and Order 73-4, § 296-24-68507, filed 5/7/73.]

WAC 296-24-690 Installation and operation of resistance welding equipment. [Order 73-5, § 296-24-690, filed 5/9/73 and Order 73-4, § 296-24-690, filed 5/7/73.]

WAC 296-24-69001 General. (1) Installation. All equipment shall be installed by a qualified electrician in conformance with the National Electrical Code, Part 5 of NFPA-1971 (ANSI-C 1-1971). There shall be a safety-type disconnecting switch or a circuit breaker or circuit interrupter to open each power circuit to the machine, conveniently located at or near the machine, so that the power can be shut off when the machine or its controls are to be serviced.

(2) Thermal Protection. Ignitron tubes used in resistance welding equipment shall be equipped with a thermal protection switch.

(3) Personnel. Workmen designated to operate resistance welding equipment shall have been properly instructed and judged competent to operate such equipment.

(4) Guarding. Controls of all automatic or air and hydraulic clamps shall be arranged or guarded to prevent the operator from accidentally activating them. [Order 73-5, § 296-24-69001, filed 5/9/73 and Order 73-4, § 296-24-69001, filed 5/7/73.]

WAC 296-24-69003 Spot and seam welding machines (nonportable). (1) Voltage. All external weld initiating control circuits shall operate on low voltage, not over 120 volts.

(2) Capacitor Welding. Stored energy or capacitor discharge type of resistance welding equipment and control panels involving high voltage (over 550 volts) shall be suitably insulated and protected by complete enclosures, all doors of which shall be provided with suitable interlocks and contacts wired into the control circuit (similar to elevator interlocks). Such interlocks or contacts shall be so designed as to effectively interrupt power and short circuit all capacitors when the door or panel is open. A manually operated switch or suitable positive device shall be installed, in addition to the mechanical interlocks or contacts, as an added safety measure assuring absolute discharge of all capacitors.

(3) Interlocks. All doors and access panels of all resistance welding machines and control panels shall be kept locked and interlocked to prevent access, by unauthorized persons, to live portions of the equipment.

(4) Guarding. All press welding machine operations, where there is a possibility of the operator's fingers being under the point of operation, shall be effectively guarded by the use of a device such as an electronic eye safety circuit, two hand controls or protections similar to that prescribed for punch press operation, WAC 296-24-19501 through WAC 296-24-19513. All chains, gears, operating bus linkage, and belts shall be protected by adequate guards, in accordance with WAC 296-24-20501 through WAC 296-24-20533.

(5) Shields. The hazard of flying sparks shall be, wherever practical, eliminated by installing a shield guard of safety glass or suitable fire-resistant plastic at the point of operation. Additional shields or curtains shall be installed as necessary to protect passing persons from flying sparks. (See WAC 296-24-70003(1)(c).)

(6) Foot Switches. All foot switches shall be guarded to prevent accidental operation of the machine.

(7) Stop Buttons. Two or more safety emergency stop buttons shall be provided on all special multispot welding machines, including 2-post and 4-post weld presses.

(8) Safety Pins. On large machines, four safety pins with plugs and receptacles (one in each corner) shall be provided so that when safety pins are removed and inserted in the ram or platen, the press becomes inoperative.

(9) Grounding. Where technically practical, the secondary of all welding transformers used in multispot, protection and seam welding machines shall be grounded. This may be done by permanently grounding one side of the welding secondary current circuit. Where not technically practical, a center tapped grounding reactor connected across the secondary or the use of a safety disconnect switch in conjunction with the welding control are acceptable alternates. Safety disconnect shall be arranged to open both sides of the line when welding current is not present. [Order 73-5, § 296-24-69003, filed 5/9/73 and Order 73-4, § 296-24-69003, filed 5/7/73.]

WAC 296-24-69005 Portable welding machines. (1) Counter-balance. All portable welding guns shall have suitable counter-balanced devices for supporting the guns, including cables, unless the design of the gun or fixture makes counterbalancing impractical or unnecessary.

(2) Safety Chains. All portable welding guns, transformers and related equipment that is suspended from overhead structures, eye beams, trolleys, etc., shall be equipped with safety chains or cables. Safety chains or cables shall be capable of supporting the total shock load in the event of failure of any component of the supporting system.

(3) Clevis. When trolleys are used to support portable welding equipment, they shall be equipped with suitable forged steel clevis for the attachment of safety chains. Each clevis shall be capable of supporting the total shock load of the suspended equipment in the event of trolley failure.

(4) Switch Guards. All initiating switches, including retraction and dual schedule switches, located on the portable welding gun shall be equipped with suitable guards capable of preventing accidental initiation through contact with fixturing, operator's clothing, etc. Initiating switch voltage shall not exceed 24 volts.

(5) Moving Holder. The movable holder, where it enters the gun frame, shall have sufficient clearance to prevent the shearing of fingers carelessly placed on the operating movable holder.

(6) Grounding. The secondary and case of all portable welding transformers shall be grounded. Secondary grounding may be by center tapped secondary or by a center tapped grounding reactor connected across the secondary. [Order 73-5, § 296-24-69005, filed 5/9/73 and Order 73-4, § 296-24-69005, filed 5/7/73.]

WAC 296-24-69007 Flash welding equipment. (1) Ventilation and Flash Guard. Flash welding machines shall be equipped with a hood to control flying flash. In cases of high production, where materials may contain a film of oil and where toxic elements and metal fumes are given off, ventilation shall be provided in accordance with WAC 296-24-71501 through WAC 296-24-71525.

(2) Fire Curtains. For the protection of the operators of nearby equipment, fire-resistant curtains or suitable shields shall be set up around the machine and in such a manner that the operators movements are not hampered.

(3) If the welding process cannot be isolated, all persons who may be exposed to the hazard of arc flash shall be properly protected. [Order 74-27, § 296-24-69007, filed 5/7/74; Order 73-5, § 296-24-69007, filed 5/9/73 and Order 73-4, § 296-24-69007, filed 5/7/73.]

WAC 296-24-69009 Hazards and precautions. A job hazard analysis shall be made, by qualified personnel, of the operations to be performed on each welding machine to determine the safeguards and personal protective equipment that shall be used for each job. [Order 73-5, § 296-24-69009, filed 5/9/73 and Order 73-4, § 296-24-69009, filed 5/7/73.]

WAC 296-24-69011 Maintenance. Periodic inspection shall be made by qualified maintenance personnel, and records of the same maintained. The operator shall be instructed to report any equipment defects to his supervisor and the use of the equipment shall be discontinued until safety repairs have been completed. [Order 73-5, § 296-24-69011, filed 5/9/73 and Order 73-4, § 296-24-69011, filed 5/7/73.]

WAC 296-24-695 Fire prevention and protection. [Order 73-5, § 296-24-695, filed 5/9/73 and Order 73-4, § 296-24-695, filed 5/7/73.]

WAC 296-24-69501 Basic precautions. For elaboration of these basic precautions and of the special precautions of WAC 296-24-69503 as well as a delineation of the fire protection and prevention responsibilities of welders and cutters, their supervisors (including outside contractors) and those in management on whose property cutting and welding is to be performed, see, Standard for Fire Prevention in Use of Cutting and Welding Processes, NFPA Standard 51B, 1962. The basic precautions for fire prevention in welding or cutting work are:

(1) Fire Hazards. If the object to be welded or cut cannot readily be moved, all movable fire hazards in the vicinity shall be taken to a safe place.

(2) Guards. If the object to be welded or cut cannot be moved and if all the fire hazards cannot be removed, then guards shall be used to confine the heat, sparks, and slag, and to protect the immovable fire hazards.

(3) Restrictions. If the requirements stated in WAC 296-24-69501(1) and (2) cannot be followed then welding and cutting shall not be performed. [Order 73-5, § 296-24-69501, filed 5/9/73 and Order 73-4, § 296-24-69501, filed 5/7/73.]

WAC 296-24-69503 Special precautions. When the nature of the work to be performed falls within the scope of WAC 296-24-69501(2) certain additional precautions may be necessary:

(1) Combustible Material. Wherever there are floor openings or cracks in the flooring that cannot be closed, precautions shall be taken so that no readily combustible materials on the floor below will be exposed to sparks which might drop through the floor. The same precautions shall be observed with regard to cracks or holes in walls, open doorways and open or broken windows.

(2) Fire Extinguishers. Suitable fire extinguishing equipment shall be maintained in a state of readiness for instant use. Such equipment may consist of pails of water, buckets of sand, hose or portable extinguishers depending upon the nature and quantity of the combustible material exposed.

(3) Fire Watch. (a) Fire watchers shall be required whenever welding or cutting is performed in locations where other than a minor fire might develop, or any of the following conditions exist:

(i) Appreciable combustible material, in building construction or contents, closer than 35 feet to the point of operation.

(ii) Appreciable combustibles are more than 35 feet away but are easily ignited by sparks.

(iii) Wall or floor openings within a 35-foot radius expose combustible material in adjacent areas including concealed spaces in walls or floors.

(iv) Combustible materials are adjacent to the opposite side of metal partitions, walls, ceilings, or roofs and are likely to be ignited by conduction or radiation.

(b) Fire watchers shall have fire extinguishing equipment readily available and be trained in its use. They shall be familiar with facilities for sounding an alarm in the event of a fire. They shall watch for fires in all exposed areas, try to extinguish them only when obviously within the capacity of the equipment available, or otherwise sound the alarm. A fire watch shall be maintained for at least a half hour after completion of welding or cutting operations to detect and extinguish possible smoldering fires.

(4) Authorization. Before cutting or welding is permitted, the area shall be inspected by the individual responsible for authorizing cutting and welding operations. He shall designate precautions to be followed in granting authorization to proceed preferably in the form of a written permit.

(5) Floors. Where combustible materials such as paper clippings, wood shavings, or textile fibers are on the floor, the floor shall be swept clean for a radius of 35 feet. Combustible floors shall be kept wet, covered with damp sand, or protected by fire-resistant shields. Where floors have been wet down, personnel operating arc welding or cutting equipment shall be protected from possible shock.

(6) Prohibited Areas. Cutting or welding shall not be permitted in the following situations:

(a) In areas not authorized by management.

(b) In sprinklered buildings while such protection is impaired.

(c) In the presence of explosive atmospheres (mixtures of flammable gases, vapors, liquids, or dusts with air), or explosive atmospheres that may develop inside uncleaned or improperly prepared tanks or equipment which have previously contained such materials, or that may develop in areas with an accumulation of combustible dusts.

(d) In areas near the storage of large quantities of exposed, readily ignitable materials such as bulk sulphur, baled paper, or cotton.

(7) Relocation of Combustibles. Where practicable, all combustibles shall be relocated at least 35 feet from the work site. Where relocation is impracticable, combustibles shall be protected with flameproofed covers or otherwise shielded with metal or asbestos guards or curtains. Edges of covers at the floor should be tight to prevent sparks from going under them. This precaution is also important at overlaps where several covers are used to protect a large pile.

(8) Ducts. Ducts and conveyor systems that might carry sparks to distant combustibles shall be suitably protected or shut down.

(9) Combustible Walls. Where cutting or welding is done near walls, partitions, ceiling or roof of combustible construction, fire-resistant shields or guards shall be provided to prevent ignition.

(10) Noncombustible Walls. If welding is to be done on a metal wall, partition, ceiling or roof, precautions

shall be taken to prevent ignition of combustibles on the other side, due to conduction or radiation, preferably by relocating combustibles. Where combustibles are not relocated, a fire watch on the opposite side from the work shall be provided.

(11) **Combustible Cover.** Welding shall not be attempted on a metal partition, wall, ceiling or roof having a combustible covering nor on walls or partitions of combustible sandwich-type panel construction.

(12) **Pipes.** Cutting or welding on pipes or other metal in contact with combustible walls, partitions, ceilings or roofs shall not be undertaken if the work is close enough to cause ignition by conduction.

(13) **Management.** Management shall recognize its responsibility for the safe usage of cutting and welding equipment on its property and:

(a) Based on fire potentials of plant facilities, establish areas for cutting and welding, and establish procedures for cutting and welding, in other areas.

(b) Designate an individual responsible for authorizing cutting and welding operations in areas not specifically designed for such processes.

(c) Insist that cutters or welders and their supervisors are suitably trained in the safe operation of their equipment and the safe use of the process.

(d) Advise all contractors about flammable materials or hazardous conditions of which they may not be aware.

(14) **Supervisor.** The supervisor:

(a) Shall be responsible for the safe handling of the cutting or welding equipment and the safe use of the cutting or welding process.

(b) Shall determine the combustible materials and hazardous areas present or likely to be present in the work location.

(c) Shall protect combustibles from ignition by the following:

(i) Have the work moved to a location free from dangerous combustibles.

(ii) If the work cannot be moved, have the combustibles moved to a safe distance from the work or have the combustibles properly shielded against ignition.

(iii) See that cutting and welding are so scheduled that plant operations that might expose combustibles to ignition are not started during cutting or welding.

(d) Shall secure authorization for the cutting or welding operations from the designated management representative.

(i) Shall determine that the cutter or welder secures his approval that conditions are safe before going ahead.

(ii) Shall determine that fire protection and extinguishing equipment are properly located at the site.

(iii) Where fire watches are required, he shall see that they are available at the site.

(15) **Fire Prevention Precautions.** Cutting or welding shall be permitted only in areas that are or have been made fire safe. Within the confines of an operating plant or building, cutting and welding should preferably be done in a specific area designed for such work, such as a maintenance shop or a detached outside location. Such areas should be of noncombustible or fire-resistive construction, essentially free of combustible and flammable

contents, and suitably segregated from adjacent areas. When work cannot be moved practically, as in most construction work, the area shall be made safe by removing combustibles or protecting combustibles from ignition sources. [Order 73-5, § 296-24-69503, filed 5/9/73 and Order 73-4, § 296-24-69503, filed 5/7/73.]

WAC 296-24-69505 Welding or cutting containers.

(1) **Used Containers.** No welding, cutting, or other hot work shall be performed on used drums, barrels, tanks or other containers until they have been cleaned so thoroughly as to make absolutely certain that there are no flammable materials present or any substances such as greases, tars, acids, or other materials which when subjected to heat, might produce flammable or toxic vapors. Any pipe lines or connections to the drum or vessel shall be disconnected or blanked.

(2) **Venting and Purging.** All hollow spaces, cavities or containers shall be vented to permit the escape of air or gases before preheating, cutting or welding. Purging with inert gas is recommended. [Order 73-5, § 296-24-69505, filed 5/9/73 and Order 73-4, § 296-24-69505, filed 5/7/73.]

WAC 296-24-69507 Confined spaces. (1) **Accidental Contact.** When arc welding is to be suspended for any substantial period of time such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine be disconnected from the power source.

(2) **Torch Valve.** In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch valves shall be closed and the gas supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable, the torch and hose shall also be removed from the confined space. [Order 73-5, § 296-24-69507, filed 5/9/73 and Order 73-4, § 296-24-69507, filed 5/7/73.]

WAC 296-24-700 Protection of employees. [Order 73-5, § 296-24-700, filed 5/9/73 and Order 73-4, § 296-24-700, filed 5/7/73.]

WAC 296-24-70001 General. (1) **Railing.** A welder or helper working on platforms, scaffolds, or runways shall be protected against falling. This may be accomplished by the use of railings, safety belts, life lines, or some other equally effective safeguards.

(2) **Welding Cable.** Welders shall place welding cable and other equipment so that it is clear of passageways, ladders, and stairways. [Order 73-5, § 296-24-70001, filed 5/9/73 and Order 73-4, § 296-24-70001, filed 5/7/73.]

WAC 296-24-70003 Eye protection. (1) **Selection.** (a) Helmets or hand shields shall be used during all arc welding or arc cutting operations, excluding submerged

arc welding. Goggles should also be worn during arc welding or cutting operations to provide protection from injurious rays from adjacent work, and from flying objects. The goggles may have either clear or colored glass, depending upon the amount of exposure to adjacent welding operations. Helpers or attendants shall be provided with proper eye protection.

(b) Goggles or other suitable eye protection shall be used during all gas welding or oxygen cutting operations. Spectacles without side shields, with suitable filter lenses are permitted for use during gas welding operations on light work, for torch brazing or for inspection.

(c) All operators and attendants of resistance welding or resistance brazing equipment shall use transparent face shields or goggles, depending on the particular job, to protect their faces or eyes, as required.

(d) Eye protection in the form of suitable goggles shall be provided where needed for brazing operations not covered in (1)(a), (b) and (c) of this section.

(2) Specifications For Protectors. (a) Helmets and hand shields shall be made of a material which is an insulator for heat and electricity. Helmets, shields and goggles shall be not readily flammable and shall be capable of understanding sterilization.

(b) Helmets and hand shields shall be arranged to protect the face, neck and ears from direct radiant energy from the arc.

(c) Helmets shall be provided with filter plates and cover plates designed for easy removal.

(d) All parts shall be constructed of a material which will not readily corrode or discolor the skin.

(e) Goggles shall be ventilated to prevent fogging of the lenses as much as practicable.

(f) Cover lenses or plates should be provided to protect each helmet, hand shield or goggle filter lens or plate.

(g) All glass for lenses shall be tempered, substantially free from striae, air bubbles, waves and other flaws. Except when a lens is ground to provide proper optical correction for defective vision, the front and rear surfaces of lenses and windows shall be smooth and parallel.

(h) Lenses shall bear some permanent distinctive marking by which the source and shade may be readily identified.

(i) The following is a guide for the selection of the proper shade numbers. These recommendations may be varied to suit the individual's needs.

Welding Operation	Shade No.
Shielded metal-arc welding— 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	10
Gas-shielded arc welding (nonferrous)— 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	11
Gas-shielded arc welding (ferrous)— 1/16-, 3/32-, 1/8-, 5/32-inch electrodes	12

Welding Operation	Shade No.
Shielded metal-arc welding: 3/16-, 7/32-, 1/4-inch elec- trodes	12
5/16-, 3/8-inch 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 inch- es	4 or 5
Heavy cutting, 6 inches and over	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) 1/2 inch and over	6 or 8

NOTE: In gas welding or oxygen cutting where the torch produces a high yellow light, it is desirable to use a filter or lens that absorbs the yellow or sodium line in the visible light of the operation.

(j) All filter lenses and plates shall meet the test for transmission of radiant energy prescribed in ANSI Z 87.1-1968—American National Standard Practice for Occupational and Educational Eye and Face Protection.

(3) Protection From Arc Welding Rays. Where the work permits, the welder should be enclosed in an individual booth painted with a finish of low-reflectivity such as zinc oxide (an important factor for absorbing ultraviolet radiations) and lamp black, or shall be enclosed with noncombustible screens similarly painted. Booths and screens shall permit circulation of air at floor level. Workers or other persons adjacent to the welding areas shall be protected from the rays by non-combustible or flameproof screens or shields or shall be required to wear appropriate goggles. [Order 73-5, § 296-24-70003, filed 5/9/73 and Order 73-4, § 296-24-70003, filed 5/7/73.]

WAC 296-24-70005 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, asbestos, 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. [Order 73-5, § 296-24-70005, filed 5/9/73 and Order 73-4, § 296-24-70005, filed 5/7/73.]

WAC 296-24-70007 Work in confined spaces. (1) General. As used herein confined space is intended to mean a relatively small or restricted space such as a tank, boiler, pressure vessel, or small compartment of a ship.

(2) Ventilation. Ventilation is a prerequisite to work in confined spaces. For ventilation requirements see WAC 296-24-71501 through WAC 296-24-71525.

(3) Securing Cylinders and Machinery. When welding or cutting is being performed in any confined spaces the gas cylinders and welding machines shall be left on the outside. Before operations are started, heavy portable equipment mounted on wheels shall be securely blocked to prevent accidental movement.

(4) Lifelines. Where a welder must enter a confined space through a manhole or other small opening, means shall be provided for quickly removing him in case of emergency. When safety belts and lifelines are used for this purpose they shall be so attached to the welder's body that his body cannot be jammed in a small exit opening. An attendant with a preplanned rescue procedure shall be stationed outside to observe the welder at all times and be capable of putting rescue operations into effect.

(5) Electrode Removal. When arc welding is to be suspended for any substantial period of time, such as during lunch or overnight, all electrodes shall be removed from the holders and the holders carefully located so that accidental contact cannot occur and the machine disconnected from the power source.

(6) Gas Cylinder Shutoff. In order to eliminate the possibility of gas escaping through leaks or improperly closed valves, when gas welding or cutting, the torch

valves shall be closed and the fuel-gas and oxygen supply to the torch positively shut off at some point outside the confined area whenever the torch is not to be used for a substantial period of time, such as during lunch hour or overnight. Where practicable the torch and hose shall also be removed from the confined space.

(7) Warning Sign. After welding operations are completed, the welder shall mark the hot metal or provide some other means of warning other workers. [Order 73-5, § 296-24-70007, filed 5/9/73 and Order 73-4, § 296-24-70007, filed 5/7/73.]

WAC 296-24-715 Health protection and ventilation. [Order 73-5, § 296-24-715, filed 5/9/73 and Order 73-4, § 296-24-715, filed 5/7/73.]

WAC 296-24-71501 General. (1) Contamination. The requirements in this section have been established on the basis of the following three factors in arc and gas welding which govern the amount of contamination to which welders may be exposed:

(a) Dimensions of space in which welding is to be done (with special regard to height of ceiling).

(b) Number of welders.

(c) Possible evolution of hazardous fumes, gases, or dust according to the metals involved.

(2) Ventilation. It is recognized that in individual instances other factors may be involved in which case ventilation or respiratory protective devices should be provided as needed to meet the equivalent requirements of this section. Such factors would include:

(a) Atmospheric conditions.

(b) Heat generated.

(c) Presence of volatile solvents.

(3) Screens. When welding must be performed in a space entirely screened on all sides, the screens shall be so arranged that no serious restriction of ventilation exists. It is desirable to have the screens so mounted that they are about 2 feet above the floor unless the work is performed at so low a level that the screen must be extended nearer to the floor to protect nearby workers from the glare of welding.

(4) Maximum Allowable Concentration. Local exhaust or general ventilating systems shall be provided and arranged to keep the amount of toxic fumes, gases, or dusts below the maximum allowable concentration as specified in chapter 296-62 WAC.

NOTE: A number of potentially hazardous materials are employed in fluxes, coatings, coverings, and filler metals used in welding and cutting or are released to the atmosphere during welding and cutting. These include but are not limited to the materials itemized in WAC 296-24-71509 through WAC 296-24-71523.

(5) Precautionary Labels. The employer shall ascertain the potentially hazardous materials, associated with welding, cutting, etc., and inform the employee of same wither through signs, labels or other appropriate means.

(a) All filler metals and fusible granular materials shall carry the following notice, as a minimum, on tags, boxes, or other containers:

CAUTION

Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. Use adequate ventilation. See ANSI Z 49.1-1967 Safety in Welding and Cutting published by the American Welding Society.

(b) Brazing (welding) filler metals containing cadmium in significant amounts shall carry the following notice on tags, boxes, or other containers:

WARNING

**CONTAINS CADMIUM—POISONOUS FUMES
MAY BE FORMED ON HEATING**

Do not breathe fumes. Use only with adequate ventilation such as fume collectors, exhaust ventilators, or air-supplied respirators. See ANSI Z 49.1-1967.

If chest pain, cough, or fever develops after use call physician immediately.

Keep children away when using.

(c) Brazing and gas welding fluxes containing fluorine compounds shall have a cautionary wording to indicate that they contain fluorine compounds. One such cautionary wording recommended by the American Welding Society for brazing and gas welding fluxes reads as follows:

CAUTION

CONTAINS FLUORIDES

This flux when heated gives off fumes that may irritate eyes, nose and throat.

(i) Avoid fumes—use only in well-ventilated spaces.

(ii) Avoid contact of flux with eyes or skin.

(iii) Do not take internally. [Order 73-5, § 296-24-71501, filed 5/9/73 and Order 73-4, § 296-24-71501, filed 5/7/73.]

WAC 296-24-71503 Ventilation for general welding and cutting. (1) General. Mechanical ventilation shall be provided when welding or cutting is done on metals not covered in WAC 296-24-71509 through WAC 296-24-71523. (For specific material, see the ventilation requirements of WAC 296-24-71509 through WAC 296-24-71523.)

(a) In a space of less than 10,000 cubic feet per welder.

(b) In a room having a ceiling height of less than 16 feet.

(c) In confined spaces or where the welding space contains partitions, balconies, or other structural barriers to the extent that they significantly obstruct cross ventilation.

(2) Minimum Rate. Such ventilation shall be at the minimum rate of 2,000 cubic feet per minute per welder, except where local exhaust hoods and booths as per WAC 296-24-71505, or airline respirators approved by the U.S. Bureau of Mines for such purposes are provided. Natural ventilation is considered sufficient for welding or cutting operations where the restrictions in WAC

296-24-71503(1) are not present. [Order 73-5, § 296-24-71503, filed 5/9/73 and Order 73-4, § 296-24-71503, filed 5/7/73.]

WAC 296-24-71505 Local exhaust hoods and booths. Mechanical local exhaust ventilation may be by means of either of the following:

(1) Hoods. Freely movable hoods intended to be placed by the welder as near as practicable to the work being welded and provided with a rate of airflow sufficient to maintain a velocity in the direction of the hood of 100 linear feet per minute in the zone of welding when the hood is at its most remote distance from the point of welding. The rates of ventilation required to accomplish this control velocity using a 3-inch wide flanged suction opening are shown in the following table:

Welding zone	Minimum air flow ¹ cubic feet/minutes	Duct diameter inches ²
4 to 6 inches from arc or torch—	150	3
6 to 8 inches from arc or torch—	275	3 1/2
8 to 10 inches from arc or torch—	425	4 1/2
10 to 12 inches from arc or torch—	600	5 1/2

¹When brazing with cadmium bearing materials or when cutting on such materials increased rates of ventilation may be required.

²Nearest half-inch duct diameter based on 4,000 feet per minute velocity in pipe.

(2) Fixed Enclosure. A fixed enclosure with a top and not less than two sides which surround the welding or cutting operations and with a rate of airflow sufficient to maintain a velocity away from the welder of not less than 100 linear feet per minute. [Order 73-5, § 296-24-71505, filed 5/9/73 and Order 73-4, § 296-24-71505, filed 5/7/73.]

WAC 296-24-71507 Ventilation in confined spaces.

(1) Air Replacement. All welding and cutting operations carried on in confined spaces shall be adequately ventilated to prevent the accumulation of toxic materials or possible oxygen deficiency. This applies not only to the welder but also to helpers and other personnel in the immediate vicinity. All air replacing that withdrawn shall be clean and respirable.

(2) Airline Respirators. In such circumstances where it is impossible to provide such ventilation, airline respirators or hose masks approved by the U.S. Bureau of Mines for this purpose shall be used.

(3) Self-Contained Units. In areas immediately hazardous to life, hose masks with blowers or self-contained breathing equipment shall be used. The breathing equipment shall be approved by the U.S. Bureau of Mines.

(4) Outside Helper. Where welding operations are carried on in confined spaces and where welders and helpers are provided with hose masks, hose masks with

blowers or self-contained breathing equipment approved by the U.S. Bureau of Mines, a worker shall be stationed on the outside of such confined spaces to insure the safety of those working within.

(5) Oxygen for Ventilation. Oxygen shall not be used for ventilation. [Order 73-5, § 296-24-71507, filed 5/9/73 and Order 73-4, § 296-24-71507, filed 5/7/73.]

WAC 296-24-71509 Fluorine compounds. (1) General. In confined spaces, welding or cutting involving fluxes, coverings, or other materials which contain fluorine compounds shall be done in accordance with WAC 296-24-71507(1) through WAC 296-24-71507(5). A fluorine compound is one that contains fluorine, as an element in chemical combination, not as a free gas.

NOTE: Maximum Allowable Concentration. The need for local exhaust ventilation or airline respirators for welding or cutting in other than confined spaces will depend upon the individual circumstances. However, experience has shown such protection to be desirable for fixed-location production welding and for all production welding on stainless steels. Where air samples taken at the welding location indicate that the fluorides liberated are below the maximum allowable concentration, such protection is not necessary.

[Order 73-5, § 296-24-71509, filed 5/9/73 and Order 73-4, § 296-24-71509, filed 5/7/73.]

WAC 296-24-71511 Zinc. (1) Confined Spaces. In confined spaces welding or cutting involving zinc-bearing base or filler metals or metals coated with zinc-bearing materials shall be done in accordance with WAC 296-24-71507(1) through WAC 296-24-71507(5).

(2) Indoors. Indoors, welding or cutting involving zinc-bearing base or filler metals coated with zinc-bearing materials shall be done in accordance with WAC 296-24-71505(1) and WAC 296-24-71505(2). [Order 73-5, § 296-24-71511, filed 5/9/73 and Order 73-4, § 296-24-71511, filed 5/7/73.]

WAC 296-24-71513 Lead. (1) Confined Spaces. In confined spaces, welding involving lead-base metals (erroneously called lead-burning) shall be done in accordance with WAC 296-24-71507(1) through WAC 296-24-71507(5).

(2) Indoors. Indoors, welding involving lead-base metals shall be done in accordance with WAC 296-24-71505(1) and WAC 296-24-71505(2).

(3) Local Ventilation. In confined spaces or indoors, welding or cutting involving metals containing lead, other than as an impurity, or involving metals coated with lead-bearing materials, including paint shall be done using local exhaust ventilation or airline respirators. Outdoors such operations shall be done using respiratory protective equipment approved by the U.S. Bureau of

Mines for such purposes. In all cases, workers in the immediate vicinity of the cutting operation shall be protected as necessary by local exhaust ventilation or airline respirators. [Order 73-5, § 296-24-71513, filed 5/9/73 and Order 73-4, § 296-24-71513, filed 5/7/73.]

WAC 296-24-71515 Beryllium. Welding or cutting indoors, outdoors, or in confined spaces involving beryllium-containing base or filler metals shall be done using local exhaust ventilation and airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by chapter 296-62 WAC. In all cases, workers in the immediate vicinity of the welding or cutting operations shall be protected as necessary by local exhaust ventilation or airline respirators. [Order 73-5, § 296-24-71515, filed 5/9/73 and Order 73-4, § 296-24-71515, filed 5/7/73.]

WAC 296-24-71517 Cadmium. (1) General. Welding or cutting indoors or in confined spaces involving cadmium-bearing or cadmium-coated base metals shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors such operations shall be done using respiratory protective equipment such as fume respirators approved by the U.S. Bureaus of Mines for such purposes.

(2) Confined Space. Welding (brazing) involving cadmium-bearing filler metals shall be done using ventilation as prescribed in WAC 296-24-71505 or WAC 296-24-71507 if the work is to be done in a confined space. [Order 73-5, § 296-24-71517, filed 5/9/73 and Order 73-4, § 296-24-71517, filed 5/7/73.]

WAC 296-24-71519 Mercury. Welding or cutting indoors or in a confined space involving metals coated with mercury-bearing materials including paint, shall be done using local exhaust ventilation or airline respirators unless atmospheric tests under the most adverse conditions have established that the workers' exposure is within the acceptable concentrations defined by chapter 296-62 WAC. Outdoors such operations shall be done using respiratory protective equipment approved by the U.S. Bureau of Mines for such purposes. [Order 73-5, § 296-24-71519, filed 5/9/73 and Order 73-4, § 296-24-71519, filed 5/7/73.]

WAC 296-24-71521 Cleaning compounds. (1) Manufacturer's Instructions. In the use of cleaning materials, because of their possible toxicity or flammability, appropriate precautions such as manufacturer's instructions shall be followed.

(2) Degreasing. Degreasing or other cleaning operations involving chlorinated hydrocarbons shall be so located that no vapors from these operations will reach or be drawn into the atmosphere surrounding any welding operation. In addition, trichloroethylene and perchlorethylene should be kept out of atmospheres penetrated by the ultraviolet radiation of gas-shielded

welding operations. [Order 73-5, § 296-24-71521, filed 5/9/73 and Order 73-4, § 296-24-71521, filed 5/7/73.]

WAC 296-24-71523 Cutting of stainless steels. Oxygen cutting, using either a chemical flux or iron powder or gas-shielded arc cutting of stainless steel, shall be done using mechanical ventilation adequate to remove the fumes generated. [Order 73-5, § 296-24-71523, filed 5/9/73 and Order 73-4, § 296-24-71523, filed 5/7/73.]

WAC 296-24-71525 First-aid equipment. First-aid equipment shall be available at all times. On every shift of welding operations there should be present employees trained to render first aid. All injuries shall be reported as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided. [Order 73-5, § 296-24-71525, filed 5/9/73 and Order 73-4, § 296-24-71525, filed 5/7/73.]

WAC 296-24-720 Industrial applications. [Order 73-5, § 296-24-720, filed 5/9/73 and Order 73-4, § 296-24-720, filed 5/7/73.]

WAC 296-24-72001 Transmission pipeline. (1) General. The requirements of WAC 296-24-68501 through WAC 296-24-68507, WAC 296-24-70001 through WAC 296-24-70007, and WAC 296-24-71501 through WAC 296-24-71525, shall be observed.

(2) Field Shop Operations. Where field shop operations are involved for fabrication of fittings, river crossings, road crossings, and pumping and compressor stations the requirements of WAC 296-24-68001, WAC 286-24-68501 through WAC 296-24-68507, WAC 296-24-69501 through WAC 296-24-69507, WAC 296-24-70001 through WAC 296-24-70007 and WAC 296-24-71501 through WAC 296-24-71525 shall be observed.

(3) Electric Shock. When arc welding is performed in wet conditions, or under conditions of high humidity, special protection against electric shock shall be supplied.

(4) Pressure Testing. In pressure testing of pipelines, the workers and the public shall be protected against injury by the blowing out of closures or other pressures restraining devices. Also, protection shall be provided against expulsion of loose dirt that may have become trapped in the pipe.

(5) Construction Standards. The welded construction of transmission pipelines shall be conducted in accordance with the Standard for Welding pipe Lines and Related Facilities, API Std. 1104-1968.

(6) Flammable Substance Lines. The connection, by welding, of branches to pipelines carrying flammable substances shall be performed in accordance with Welding or Hot Tapping on Equipment Containing Flammables, API Std. PSD No. 2201-1963.

(7) X-ray Inspection. The use of X-rays and radioactive isotopes for the inspection of welded pipeline joints shall be carried out in conformance with the American National Standard Safety Standard for Non-Medical

X-ray and Sealed Gamma-Ray Sources, ANSI Z 54.1-1963. [Order 73-5, § 296-24-72001, filed 5/9/73 and Order 73-4, § 296-24-72001, filed 5/7/73.]

WAC 296-24-72003 Mechanical piping systems. (1) General. The requirements of WAC 296-24-68001, WAC 296-24-68501 through WAC 296-24-68507, WAC 296-24-69501 through WAC 296-24-69507, WAC 296-24-70001 through WAC 296-24-70007 and WAC 296-24-71501 through WAC 296-24-71525 shall be observed.

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WAC 296-24-722 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.

(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 specified in these rules for this type of work.

(b) In the open air, employees shall be protected by a respirator, suitable for the type of work being done.

(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 73-5, § 296-24-722, filed 5/9/73 and Order 73-4, § 296-24-722, filed 5/7/73.]

Part J-1

WORKING SURFACES, GUARDING FLOORS AND WALL OPENINGS, LADDERS, SCAFFOLDS

WAC

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296-24-73501	General requirements.
296-24-73503	Housekeeping.
296-24-73505	Aisles and passageways.
296-24-73507	Covers and guardrails.
296-24-73509	Floor loading protection.
296-24-73511	Steam pipes.
296-24-73513	Buildings—Floors.

welding operations. [Order 73-5, § 296-24-71521, filed 5/9/73 and Order 73-4, § 296-24-71521, filed 5/7/73.]

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WAC 296-24-71525 First-aid equipment. First-aid equipment shall be available at all times. On every shift of welding operations there should be present employees trained to render first aid. All injuries shall be reported as soon as possible for medical attention. First aid shall be rendered until medical attention can be provided. [Order 73-5, § 296-24-71525, filed 5/9/73 and Order 73-4, § 296-24-71525, filed 5/7/73.]

WAC 296-24-720 Industrial applications. [Order 73-5, § 296-24-720, filed 5/9/73 and Order 73-4, § 296-24-720, filed 5/7/73.]

WAC 296-24-72001 Transmission pipeline. (1) General. The requirements of WAC 296-24-68501 through WAC 296-24-68507, WAC 296-24-70001 through WAC 296-24-70007, and WAC 296-24-71501 through WAC 296-24-71525, shall be observed.

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(3) Electric Shock. When arc welding is performed in wet conditions, or under conditions of high humidity, special protection against electric shock shall be supplied.

(4) Pressure Testing. In pressure testing of pipelines, the workers and the public shall be protected against injury by the blowing out of closures or other pressures restraining devices. Also, protection shall be provided against expulsion of loose dirt that may have become trapped in the pipe.

(5) Construction Standards. The welded construction of transmission pipelines shall be conducted in accordance with the Standard for Welding pipe Lines and Related Facilities, API Std. 1104-1968.

(6) Flammable Substance Lines. The connection, by welding, of branches to pipelines carrying flammable substances shall be performed in accordance with Welding or Hot Tapping on Equipment Containing Flammables, API Std. PSD No. 2201-1963.

(7) X-ray Inspection. The use of X-rays and radioactive isotopes for the inspection of welded pipeline joints shall be carried out in conformance with the American National Standard Safety Standard for Non-Medical

X-ray and Sealed Gamma-Ray Sources, ANSI Z 54.1-1963. [Order 73-5, § 296-24-72001, filed 5/9/73 and Order 73-4, § 296-24-72001, filed 5/7/73.]

WAC 296-24-72003 Mechanical piping systems. (1) General. The requirements of WAC 296-24-68001, WAC 296-24-68501 through WAC 296-24-68507, WAC 296-24-69501 through WAC 296-24-69507, WAC 296-24-70001 through WAC 296-24-70007 and WAC 296-24-71501 through WAC 296-24-71525 shall be observed.

(2) X-ray Inspection. The use of X-rays and radioactive isotopes for the inspection of welded piping joints shall be in conformance with the American National Standard Safety Standard for Non-Medical X-ray and Sealed Gamma-Ray Sources, ANSI Z 54.1-1963. [Order 73-5, § 296-24-72003, filed 5/9/73 and Order 73-4, § 296-24-72003, filed 5/7/73.]

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(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 specified in these rules for this type of work.

(b) In the open air, employees shall be protected by a respirator, suitable for the type of work being done.

(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 73-5, § 296-24-722, filed 5/9/73 and Order 73-4, § 296-24-722, filed 5/7/73.]

Part J-1

WORKING SURFACES, GUARDING FLOORS AND WALL OPENINGS, LADDERS, SCAFFOLDS

WAC

296-24-735	Walking-working surfaces.
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 296-24-82517 Stone setters' adjustable multiple-point suspension scaffolds.
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 296-24-82521 Boatswain's chairs.
 296-24-82523 Carpenters' bracket scaffolds.
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 296-24-82527 Horse scaffolds.
 296-24-82529 Needle beam scaffold.
 296-24-82531 Plasterers', decorators', and large area scaffolds.
 296-24-82533 Interior hung scaffolds.
 296-24-82535 Ladder-jack scaffolds.
 296-24-82537 Window-jack scaffolds.
 296-24-82539 Roofing brackets.
 296-24-82541 Crawling boards or chicken ladders.
 296-24-82543 Float or ship scaffolds.
 296-24-82545 Scope.
 296-24-840 Manually propelled mobile ladder stands and scaffolds (towers).
 296-24-84001 Definitions.
 296-24-84003 General requirements.
 296-24-84005 Mobile tubular welded frame scaffolds.
 296-24-84007 Mobile tubular welded sectional folding scaffolds.
 296-24-84009 Mobile tube and coupler scaffolds.
 296-24-84011 Mobile work platforms.
 296-24-84013 Mobile ladder stands.
 296-24-855 Other working surfaces.
 296-24-85501 Dockboards (bridge plates).
 296-24-85503 Forging machine area.

296-24-85505 Veneer machinery.

WAC 296-24-735 Walking-working surfaces. [Order 73-5, § 296-24-735, filed 5/9/73 and Order 73-4, § 296-24-735, filed 5/7/73.]

WAC 296-24-73501 General requirements. This section applies to all permanent places of employment, except where domestic, mining, or agricultural work only is performed. Construction work is not to be deemed as a permanent place of employment. Measures for the control of toxic materials are considered to be outside the scope of this section. [Order 73-5, § 296-24-73501, filed 5/9/73 and Order 73-4, § 296-24-73501, filed 5/7/73.]

WAC 296-24-73503 Housekeeping. (1) All places of employment, passageways, storerooms, and service rooms shall be kept clean, orderly and in a sanitary condition.

(2) The floor of every workroom shall be maintained in a clean, and so far as possible, a dry condition. Where wet processes are used, drainage shall be maintained, and false floors, platforms, mats, or other dry standing places shall be provided where practicable.

(3) To facilitate cleaning, every floor, working place, and passageway shall be kept free from protruding nails, splinters, holes, or loose boards.

(4) All materials stored in tiers shall be stacked, racked, blocked, interlocked, or otherwise secured to prevent sliding, falling or collapse. [Order 74-27, § 296-24-73503, filed 5/7/74; Order 73-5, § 296-24-73503, filed 5/9/73 and Order 73-4, § 296-24-73503, filed 5/7/73.]

WAC 296-24-73505 Aisles and passageways. (1) Where mechanical handling equipment is used, sufficient safe clearances shall be allowed for aisles, at loading docks, through doorways and wherever turns or passage must be made. Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard.

(2) Permanent aisles and passageways shall be appropriately marked.

(3) All trestles in connection with industrial plants on which cars run, which are also used as walkways for workmen, shall be equipped with a walkway on the outer edge, so located as to give safe minimum clearance of three feet to cars. Such walkways shall be equipped with standard rails. Where a trestle crosses a driveway or passageway the trestle over such points shall be solidly boarded over. [Order 73-5, § 296-24-73505, filed 5/9/73 and Order 73-4, § 296-24-73505, filed 5/7/73.]

WAC 296-24-73507 Covers and guardrails. (1) All open vats and tanks into which workers may fall shall be guarded with railings or screen guards.

(2) All open vats and tanks where workers are employed shall have a platform or walkway 42 inches below the top of vat or tank or where walkway is flush with top of vat or tank, a standard safeguard of 36 to 42 inches high shall be constructed.

(3) Every tank over five feet deep, excepting where agitators are used or where products may be damaged by ladders, shall have a ladder fixed on the inside so placed as to connect with means of access from the outside. Rungs shall have a clearance of at least six inches measured between the rung and the side of the tank. [Order 74-27, § 296-24-73507, filed 5/7/74; Order 73-5, § 296-24-73507, filed 5/9/73 and Order 73-4, § 296-24-73507, filed 5/7/73.]

WAC 296-24-73509 Floor loading protection. (1) In every building or other structure, or part thereof, used for mercantile, business, industrial, or storage purposes, the loads approved by the building official shall be marked on plates of approved design which shall be supplied and securely affixed by the owner of the building, or his duly authorized agent, in a conspicuous place in each space to which they relate. Such plates shall not be removed or defaced but, if lost, removed, or defaced, shall be replaced by the owner or his agent.

(2) It shall be unlawful to place, or cause, or permit to be placed, on any floor or roof of a building or other structure a load greater than that for which such floor or roof is approved by the building official. [Order 73-5, § 296-24-73509, filed 5/9/73 and Order 73-4, § 296-24-73509, filed 5/7/73.]

WAC 296-24-73511 Steam pipes. (1) All steam pipes or pipes heated by any other means to a sufficient temperature to burn a person (other than coil pipes, radiators, for heating rooms or buildings, or pipes on portable steam engines and boilers) and which are within seven feet of a floor or platform, if exposed to contact, shall be guarded with a standard safeguard.

(2) Protection from Hot Pipes. All exposed hot pipes within seven feet of the floor or working platform, or within 15 inches 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. [Order 74-27, § 296-24-73511, filed 5/7/74.]

WAC 296-24-73513 Buildings—Floors. (1) All buildings, docks, tramways, walkways, log dumps and other structures shall be so designed, constructed, and maintained as to provide a safety factor of 4. This means that all members shall be capable of supporting four times the maximum strain to be imposed. This provision refers to buildings, docks, etc. 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.

(2) The floors of all buildings, platforms, walks and driveways, storage yards, docks, etc., and all parts thereof, and all supporting members shall be of substantial construction and kept in good repair and free from accumulations of debris. Floors which are maintained in a polished condition shall be polished with a non-slip preparation of an approved type.

(3) Flooring of buildings, ramps, docks, trestles and other structures required to support motive equipment

shall be of not less than full two and one-half (2 1/2) inch material. However, where flooring is covered by steel floor plates, 2 inch material may be used. [Order 74-27, § 296-24-73513, filed 5/7/74.]

WAC 296-24-750 Guarding floor and wall openings and holes. [Order 73-5, § 296-24-750, filed 5/9/73 and Order 73-4, § 296-24-750, filed 5/7/73.]

WAC 296-24-75001 Terms. The following terms shall have the meaning ascribed in this section, when referred to in WAC 296-24-75003 through WAC 296-24-75011, unless the context requires otherwise. (1) Floor Hole. An opening measuring less than 12 inches but more than 1 inch in its least dimension, in any floor, platform, pavement, or yard, through which materials but not persons may fall; such as a belt hole, pipe opening, or slot opening.

(2) Floor Opening. An opening measuring 12 inches or more in its least dimension, in any floor, platform, pavement, or yard, through which persons may fall; such as a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this subpart.

(3) Handrail. 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.

(4) Platform. 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.

(5) Runway. A passageway for persons, elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

(6) Standard Railing. A vertical barrier erected along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent falls of person.

(7) Standard Strength and Construction. Any construction of railings, covers, or other guards that meets the requirements of WAC 296-24-750 through WAC 296-24-75011.

(8) Stair Railing. A vertical barrier erected along exposed sides of a stairway to prevent falls of persons.

(9) Toeboard. 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.

(10) Wall Hole. An opening less than 30 inches but more than 1 inch high, of unrestricted width, in any wall or partition; such as a ventilation hole or drainage scupper.

(11) Wall Opening. An opening at least 30 inches high and 18 inches wide, in any wall or partition, through which persons may fall; such as a yard-arm doorway or chute opening. [Order 73-5, § 296-24-75001, filed 5/9/73 and Order 73-4, § 296-24-75001, filed 5/7/73.]

WAC 296-24-75003 Protection for floor openings.

(1) Every stairway floor opening shall be guarded by a standard railing constructed in accordance with WAC

296-24-75011. The railing shall be provided on all exposed sides (except at entrance to stairway). For infrequently used stairways where traffic across the opening prevents the use of fixed standard railing (as when located in aisle spaces, etc.), the guard shall consist of a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at entrance to stairway).

(2) Every ladderway floor opening or platform shall be guarded by a standard railing with standard toeboard 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.

(3) Every hatchway and chute floor opening shall be guarded by one of the following:

(a) Hinged floor opening cover of standard strength and construction equipped with standard railings or permanently attached thereto so as to leave 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.

(b) A removable railing with toeboard on not more than two sides of the opening and fixed standard railings with toeboards on all other exposed sides. The removable railings shall be kept in place when the opening is not in use and should preferably be hinged or otherwise mounted so as to be conveniently replaceable.

Where operating conditions necessitate the feeding of material into any hatchway or chute opening, protection shall be provided to prevent a person from falling through the opening.

(c) 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 telltales shall be installed to hang within five and one-half feet of ground or floor level.

(d) 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.

(4) Every skylight opening and hole shall be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.

(5) Every pit and trapdoor floor opening, infrequently used, shall be guarded by a floor opening cover of standard strength and construction which should be hinged in place. While the cover is not in place, the pit or trap opening shall be constantly attended by someone or shall be protected on all exposed sides by removable standard railings.

(6) Every manhole floor opening shall be guarded by a standard manhole cover which need not be hinged in place. While the cover is not in place, the manhole opening shall be constantly attended by someone or shall be protected by removable standard railings.

(7) Every temporary floor opening shall have standard railings, or shall be constantly attended by someone.

(8) Every floor hole into which persons can accidentally walk shall be guarded by either:

(a) A standard railing with standard toeboard on all exposed sides, or

(b) A floor hole cover of standard strength and construction that should be hinged in place. While the cover is not in place, the floor hole shall be constantly attended by someone or shall be protected by a removable standard railing.

(9) Every floor hole into which persons cannot accidentally walk (on account of fixed machinery, equipment, or walls) shall be protected by a cover that leaves no openings more than 1 inch wide. The cover shall be securely held in place to prevent tools or materials from falling through.

(10) 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 to less than 20 inches. [Order 74-27, § 296-24-75003, filed 5/7/74; Order 73-5, § 296-24-75003, filed 5/9/73 and Order 73-4, § 296-24-75003, filed 5/7/73.]

WAC 296-24-75005 Protection for wall openings and holes. (1) Every wall opening from which there is a drop of more than 4 feet shall be guarded by one of the following:

(a) Rail, roller, picket fence, half door, or equivalent barrier.

The guard may be removable but should preferably be hinged or otherwise mounted so as to be conveniently replaceable. Where there is exposure below to falling materials, a removable toeboard or the equivalent shall also be provided. When the opening is not in use for handling materials, the guard shall be kept in position regardless of a door on the opening. In addition, a grab handle shall be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.

(b) Extension platform onto which materials can be hoisted for handling, and which shall have side rails or equivalent guards of standard specifications.

(2) Every chute wall opening from which there is a drop of more than 4 feet shall be guarded by one or more of the barriers specified in WAC 296-24-75005(1)(a) and (b), or as required by the conditions.

(3) Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, shall be guarded by standard slats, standard grill work (as specified in WAC 296-24-75011(11)), or standard railing.

Where the window opening is below the landing, or platform, a standard toeboard shall be provided.

(4) Every temporary wall opening shall have adequate guards but these need not be of standard construction.

(5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole more than 5 feet above the next lower level, the hole shall be protected by a standard toeboard, or an enclosing screen either of solid construction, or as specified in WAC 296-24-75011(11). [Order 73-5, § 296-24-75005, filed 5/9/73 and Order 73-4, § 296-24-75005, filed 5/7/73.]

WAC 296-24-75007 Protection of open-sided floors, platforms and runways. (1) Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing (or the equivalent as specified in WAC 296-24-75011(3)) on all open sides, except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toeboard wherever, beneath the open sides,

- (a) Person can pass,
- (b) There is moving machinery, or
- (c) There is equipment with which falling materials could create a hazard.

(2) Every runway shall be guarded by a standard railing (or the equivalent as specified in WAC 296-24-75011(3)) 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 toeboard shall also be provided on each exposed side.

Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted where operating conditions necessitate such omission, providing the falling hazard is minimized by using a runway of not less than 18 inches wide. Where persons entering upon runways become thereby exposed to machinery, electrical equipment, or other danger not a falling hazard, additional guarding than is here specified may be essential for protection.

(3) 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 toeboard.

(4) Tools and loose materials shall not be left on overhead platforms and scaffolds. [Order 76-6, § 296-24-75007, filed 3/1/76; Order 73-5, § 296-24-75007, filed 5/9/73 and Order 73-4, § 296-24-75007, filed 5/7/73.]

WAC 296-24-75009 Stairway railings and guards.

(1) Every flight of stairs having four or more risers shall be equipped with standard stair railings or standard handrails as specified in (a) through (e) of this rule, the width of the stair to be measured clear of all obstructions except handrails:

(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) Winding stairs shall be equipped with a handrail offset to prevent walking on all portions of the treads having width less than 6 inches. [Order 73-5, § 296-24-

75009, filed 5/9/73 and Order 73-4, § 296-24-75009, filed 5/7/73.]

WAC 296-24-75011 Railing, toeboards, and cover specifications. (1) A standard railing shall consist of top rail, intermediate rail, and posts, and shall have a vertical height of 42 inches nominal 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.

(2) 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.

(3) Minimum requirements for standard railings under various types of construction are specified in this subsection. Dimensions specified are based on the U.S. Department of Agriculture Wood Handbook, No. 72, 1955 (No. 1 [S4S] Southern Yellow Pine [Modulus of Rupture 7,400 p.s.i.]) for wood; ANSI G 41.5-1970, American National Standard Specifications for Structural Steel, for structural steel; and ANSI B 125.1-1970, American National Standard Specifications for Welded and Seamless Steel Pipe, for pipe.

(a) For wood railings, the posts shall be of at least 2-inch by 4-inch nominal stock spaced not to exceed 6 feet; the top and intermediate rails shall be of at least 2-inch by 4-inch nominal stock. If top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts may be spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.

(b) For pipe railings, posts and top and intermediate railings shall be at least 1 1/2 inches nominal diameter with posts spaced not more than 8 feet on centers.

(c) 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.

(d) 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.

(e) Other types, sizes, and arrangements of railing construction are acceptable provided they meet the following conditions:

(i) A smooth-surfaced top rail at a height above floor, platform, runway, or ramp level of 42 inches nominal;

(ii) A strength to withstand at least the minimum requirement of 200 pounds top rail pressure;

(iii) Protection between top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail;

(iv) Elimination of overhang of rail ends unless such overhang does not constitute a hazard; such as, baluster railings, scrollwork railings, paneled railings.

(4) A standard toeboard shall be a minimum of 4 inches nominal 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 with 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.

Where material is piled to such height that a standard toeboard does not provide protection, paneling from floor to intermediate rail, or to top rail shall be provided.

(5) A handrail shall consist of a lengthwise member mounted directly on a wall or partition by means of brackets attached to the lower side of the handrail so as to offer no obstruction to a smooth surface along the top and both sides of the handrail. The handrail shall be of rounded or other section that will furnish an adequate handhold for anyone grasping it to avoid falling. The ends of the handrail should be turned in to the supporting wall or otherwise arranged so as not to constitute a projection hazard.

(a) 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.

(b) The size of handrails shall be: When of hardwood, at least 2 inches in diameter; when of metal pipe, at least 1 1/2 inches in diameter. The length of brackets shall be such as will give a clearance between handrail and wall or any projection thereon of at least 3 inches. The spacing of brackets shall not exceed 8 feet.

(c) The mounting of handrails 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 rail.

(6) All handrails and railings shall be provided with a clearance of not less than 3 inches between the handrail or railing and any other object.

(7) Floor opening covers may be of any material that meets the following strength requirements:

(a) Trench or conduit covers and their supports, when located in plant roadways, shall be designed to carry a truck rear-axle load of at least 20,000 pounds.

(b) Manhole covers and their supports, when located in plant roadways, shall comply with local standard highway requirements if any; otherwise, they shall be designed to carry a truck rear-axle of at least 20,000 pounds.

(c) The construction of floor opening covers may be of any material that meets the strength requirements. Covers projecting not more than 1 inch above the floor level may be used providing all edges are chamfered to an angle with the horizontal of not over 30 degrees. All hinges, handles, bolts, or other parts shall set flush with the floor or cover surface.

(8) Skylight screens shall be of such construction and mounting that they are capable of withstanding a load of at least 200 pounds applied perpendicularly at any one area on the screen. They shall also be of such construction and mounting that under ordinary loads or impacts, they will not deflect downward sufficiently to break the glass below them. The construction shall be of grillwork

with openings not more than 4 inches long or of slat work with openings not more than 2 inches wide with length unrestricted.

(9) Wall opening barriers (rails, rollers, picket fences, and half doors) 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) at any point on the top rail or corresponding member.

(10) Wall opening grab handles shall be not less than 12 inches in length and shall be so mounted as to give 3 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle 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 of the handle.

(11) Wall opening 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 grillwork with openings not more than 8 inches long, or of slatwork with openings not more than 4 inches wide with length unrestricted. [Order 73-5, § 296-24-74011, filed 5/9/73 and Order 73-4, § 296-24-75011, filed 5/7/73.]

WAC 296-24-765 Fixed industrial stairs. [Order 73-5, § 296-24-765, filed 5/9/73 and Order 73-4, § 296-24-765, filed 5/7/73.]

WAC 296-24-76501 Terms. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-76503 through 296-24-76523 unless the context requires otherwise. (1) Handrail. A single bar or pipe supported on brackets from a wall or partition to provide a continuous handhold for persons using a stair.

(2) Nose, Nosing. That portion of a tread projecting beyond the face of the riser immediately below.

(3) Open Riser. The air space between the treads of stairways without upright members (risers).

(4) Platform. An extended step or landing breaking a continuous run of stairs.

(5) Railing. A vertical barrier erected along exposed sides of stairways and platforms to prevent falls of persons. The top member of railing usually serves as a handrail.

(6) Rise. The vertical distance from the top of a tread to the top of the next higher tread.

(7) Riser. The upright member of a step situated at the back of a lower tread and near the leading edge of the next higher tread.

(8) Stairs, Stairway. 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. A series of steps and landings having three or more risers constitutes stairs or stairway.

(9) Tread. The horizontal member of a step.

(10) Tread Run. The horizontal distance from the leading edge of a tread to the leading edge of an adjacent tread.

(11) Tread Width. The horizontal distance from front to back of tread including nosing when used. [Order 73-5, § 296-24-76501, filed 5/9/73 and Order 73-4, § 296-24-76501, filed 5/7/73.]

WAC 296-24-76503 Application of requirements.

This section contains specifications for the safe design and construction of fixed general industrial stairs. This classification includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits. This section does not apply to stairs used for fire exit purposes, to construction operations, to private residences, or to articulated stairs, such as may be installed on floating roof tanks or on dock facilities, the angle of which changes with the rise and fall of the base support. [Order 73-5, § 296-24-76503, filed 5/9/73 and Order 73-4, § 296-24-76503, filed 5/7/73.]

WAC 296-24-76505 Where fixed stairs are required. Fixed stairs shall be provided for access from one structure level to another where operations necessitate regular travel between levels, and for access to operating platforms at any equipment which requires attention routinely during operations. Fixed stairs shall also be provided where access to elevations is daily or at each shift for such purposes as gauging, inspection, regular maintenance, etc., where such work may expose employees to acids, caustics, gases, or other harmful substances, or for which purposes the carrying of tools or equipment by hand is normally required. (It is not the intent of this section to preclude the use of fixed ladders for access to elevated tanks, towers, and similar structures, overhead traveling cranes, etc., where the use of fixed ladders is common practice.) 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. Winding stairways may be installed on tanks and similar round structures where the diameter of the structure is not less than five (5) feet. [Order 73-5, § 296-24-76505, filed 5/9/73 and Order 73-4, § 296-24-76505, filed 5/7/73.]

WAC 296-24-76507 Stair strength. Fixed stairways shall be designed and constructed to carry a load of five times the normal live load anticipated but never of less strength than to carry safely a moving concentrated load of 1,000 pounds. [Order 73-5, § 296-24-76507, filed 5/9/73 and Order 73-4, § 296-24-76507, filed 5/7/73.]

WAC 296-24-76509 Stair width. Fixed stairways shall have a minimum width of 22 inches. [Order 73-5, § 296-24-76509, filed 5/9/73 and Order 73-4, § 296-24-76509, filed 5/7/73.]

WAC 296-24-76511 Angle of stairway rise. Fixed stairs shall be installed at angles to the horizontal of between 30° and 50°. Any uniform combination of

rise/tread dimensions may be used that will result in a stairway at any angle to the horizontal within the permissible range. Table D-1 gives rise/tread dimensions which will produce a stairway within the permissible range, stating the angle to the horizontal produced by each combination. However, the rise/tread combinations are not limited to those given in Table D-1. [Order 73-5, § 296-24-76511, filed 5/9/73 and Order 73-4, § 296-24-76511, filed 5/7/73.]

WAC 296-24-76513 Stair treads. Each tread and the top landing of a stairway, where risers are used, should have a nose which extends one-half inch to 1 inch beyond the face of the lower riser. Noses should have an even leading edge. All treads shall be reasonably slip-resistant and the nosings shall be of nonslip finish. Welded bar grating treads without nosings are acceptable providing the leading edge can be readily identified by personnel descending the stairway and provided the tread is serrated or is of definite nonslip design. 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.

TABLE D-1

Angle to horizontal	Rise (in inches)	Tread run (in inches)
30°35'	6 1/2	11
32°08'	6 3/4	10 3/4
33°41'	7	10 1/2
35°16'	7 1/4	10 1/4
36°52'	7 1/2	10
38°29'	7 3/4	9 3/4
40°08'	8	9 1/2
41°44'	8 1/4	9 1/4
43°22'	8 1/2	9
45°00'	8 3/4	8 3/4
46°38'	9	8 1/2
48°16'	9 1/4	8 1/4
49°54'	9 1/2	8

[Order 73-5, § 296-24-76513, filed 5/9/73 and Order 73-4, § 296-24-76513, filed 5/7/73.]

WAC 296-24-76515 Length of stairways. Long flights of stairs, unbroken by landings or intermediate platforms, should be avoided. Consideration should be given to providing intermediate platforms where practical and where such stairways are in frequent use. Stairway platforms shall be no less than the width of a stairway and a minimum of 30 inches in length measured in the direction of travel. [Order 73-5, § 296-24-76515, filed 5/9/73 and Order 73-4, § 296-24-76515, filed 5/7/73.]

WAC 296-24-76517 Railings and handrails. Standard railings shall be provided on the open sides of all exposed stairways and stair platforms. Handrails shall

be provided on at least one side of closed stairways, preferably on the right side descending. Stair railings and handrails shall be installed in accordance with the provisions of WAC 296-24-75001 through WAC 296-24-75011. [Order 73-5, § 296-24-76517, filed 5/9/73 and Order 73-4, § 296-24-76517, filed 5/7/73.]

WAC 296-24-76519 Vertical clearance. Vertical clearance above any stair tread to an overhead obstruction shall be at least 7 feet measured from the leading edge of the tread. [Order 73-5, § 296-24-76519, filed 5/9/73 and Order 73-4, § 296-24-76519, filed 5/7/73.]

WAC 296-24-76521 Open risers. Stairs having treads of less than 9-inch width should have open risers. [Order 73-5, § 296-24-76521, filed 5/9/73 and Order 73-4, § 296-24-76521, filed 5/7/73.]

WAC 296-24-76523 General. Open grating type treads are desirable for outside stairs. [Order 73-5, § 296-24-76523, filed 5/9/73 and Order 73-4, § 296-24-76523, filed 5/7/73.]

WAC 296-24-780 Portable wood ladders. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-78003 through 296-24-78009 unless the context requires otherwise. (1) Ladders. A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

(2) Stepladder. A stepladder is a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Its size is designated by the overall length of the ladder measured along the front edge of the side rails.

(3) Single Ladder. A single ladder is a non-self-supporting portable ladder, nonadjustable in length, consisting of but one section. Its size is designated by the overall length of the side rail.

(4) Extension Ladder. An extension ladder is a non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

(5) Sectional Ladder. A sectional ladder is a non-self-supporting portable ladder, nonadjustable in length consisting of two or more sections of ladder so constructed that the sections may be combined to function as a single ladder. Its size is designated by the overall length of the assembled sections.

(6) Trestle Ladder. A trestle ladder is a self-supporting portable ladder, nonadjustable in length, consisting of two sections hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

(7) Extension Trestle Ladder. An extension trestle ladder is a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder, with suitable means for locking

the ladders together. The size is designated by the length of the trestle ladder base.

(8) Special-purpose ladder. A special-purpose ladder is a portable ladder which represents either a modification or a combination of design or construction features in one of the general-purpose types of ladders previously defined, in order to adapt the ladder to special or specific uses.

(9) Trolley Ladder. A trolley ladder is a semifixed ladder, nonadjustable in length, supported by attachments to an overhead track, the plane of the ladder being at right angles to the plane of motion.

(10) Side-rolling Ladder. A side-rolling ladder is a semifixed ladder, nonadjustable in length, supported by attachments to a guide rail, which is generally fastened to shelving, the plane of the ladder being also its plane of motion.

(11) Wood Characteristics. Wood characteristics are distinguishing features which by their extent and number determine the quality of a piece of wood.

(12) Wood Irregularities. Wood irregularities are natural characteristics in or on wood that may lower its durability, strength, or utility.

(13) Cross Grain. Cross grain (slope of grain) is a deviation of the fiber direction from a line parallel to the sides of the piece.

(14) Knot. A knot is a branch or limb, imbedded in the tree and cut through in the process of lumber manufacture, classified according to size, quality, and occurrence. The size of the knot is determined as the average diameter on the surface of the piece.

(15) Pitch and Bark Pockets. A pitch pocket is an opening extending parallel to the annual growth rings containing, or that has contained, pitch, either solid or liquid. A bark pocket is an opening between annual growth rings that contains bark.

(16) Shake. A shake is a separation along the grain, most of which occurs between the rings of annual growth.

(17) Check. A check is a lengthwise separation of the wood, most of which occurs across the rings of annual growth.

(18) Wane. Wane is bark, or the lack of wood from any cause, on the corner of a piece.

(19) Decay. Decay is disintegration of wood substance due to action of wood-destroying fungi. It is also known as dote and rot.

(20) Compression Failure. A compression failure is a deformation (buckling) of the fibers due to excessive compression along the grain.

(21) Compression Wood. Compression wood is an aberrant (abnormal) and highly variable type of wood structure occurring in softwood species. The wood commonly has density somewhat higher than does normal wood, but somewhat lower stiffness and tensile strength for its weight in addition to high longitudinal shrinkage.

(22) Low Density. Low-density wood is that which is exceptionally light in weight and usually deficient in strength properties for the species. [Order 73-5, § 296-24-780, filed 5/9/73 and Order 73-4, § 296-24-780, filed 5/7/73.]

WAC 296-24-78003 Application of requirements. This section is intended to prescribe rules and establish minimum requirements for the construction, care, and use of the common types of portable wood ladders, in order to insure safety under normal conditions of usage. Other types of special ladders, fruit-picker's ladders, industrial tripod ladders, combination step and extension ladders, stockroom step ladders, aisle-way step ladders, shelf ladders, and library ladders are not specifically covered by this section. [Order 73-5, § 296-24-78003, filed 5/9/73 and Order 73-4, § 296-24-78003, filed 5/7/73.]

WAC 296-24-78005 Materials. (1) Requirements Applicable to All Wood Parts. (a) All wood parts shall be of the species specified in Table D-5, seasoned to a moisture content of not more than 15 percent; smoothly machined and dressed on all sides; free from sharp edges and splinters; sound and free by accepted visual inspection from shake, wane, compression failures, decay, or other irregularities except as hereinafter provided. Low-density wood shall not be used.

(b) Black streaks in western hemlock shall not be considered an irregularity, except that chambers associated with black streaks when present in the part, shall be limited as specified for pitch and bark pockets.

(2) Permissible Irregularities in Side Rails and Back Rails. (a) The general slope of grain in side rails of minimum dimension shall not be steeper than 1 in 12, except that for ladders under 10 feet in length and having flat steps for treads, the general slope of grain shall not be steeper than 1 in 10. The slope of grain in areas of local grain deviation shall not be steeper than 1 in 12 or 1 in 10 as specified above when occurring on the edges or in the outer one-fourth of the width of the wide face. Local areas of grain deviation within the center half of the width of the wide face may contain grain slope as steep as 1 in 8. Local deviations of grain associated with otherwise permissible irregularities are permitted.

(b) Knots shall not appear in narrow faces of side rails. Knots, if tight and sound and less than one-half inch in diameter, are permitted on the wide face provided they are at least one-half inch back from either edge and not more frequent than 1 to any 3 feet of ladder length.

(c) Pitch and bark pockets are permitted provided they are not more than one-eighth inch in width, or more than 2 inches in length, or more than one-half inch in depth, and then only if they are not more frequent than 1 to any 3 feet of ladder length.

(d) Checks are permitted on side rails provided they are not more than 6 inches in length or more than one-half inch in depth.

(e) Occurrences of compression wood in relatively small amounts and positively identified by competent and conscientious visual inspection of side rails are permitted provided no single streak shall exceed one-half inch in width nor shall the aggregate of streaks exceed one-fourth of the face of the side rail. Borderline forms of compression wood not positively identified by competent and conscientious visual inspection are permitted.

Ladder parts containing bow or crook which would interfere with the operation of the ladder shall not be used.

(3) Permissible Irregularities in Flat Steps, Rungs, and Cleats. (a) The general slope of grain in flat steps of minimum dimension shall not be steeper than 1 in 12, except that for ladders under 10 feet in length the slope of grain shall not be steeper than 1 in 10. The slope of grain in areas of local deviation shall not be steeper than 1 in 12 or 1 in 10 as specified above. For all ladders, cross grain not steeper than 1 in 10 are permitted in lieu of 1 in 12, provided the size is increased to afford at least 15 percent greater calculated strength than for ladders built to minimum dimensions. Local deviations of grain associated with otherwise permissible irregularities are permitted.

(b) The general slope of grain and that in areas of local deviations of grain shall not be steeper than 1 in 15 in rungs and cleats. For all ladders cross grain not steeper than 1 in 12 are permitted in lieu of 1 in 15, provided the size is increased to afford at least 15 percent greater calculated strength for ladders built to minimum dimensions. Local deviations of grain associated with otherwise permissible irregularities are permitted.

(c) Knots over one-eighth inch in diameter shall not appear in rungs. Knots shall not appear in the narrow faces of flat steps and cleats. Knots appearing in the wide faces of flat steps and cleats shall not exceed a diameter of one-fourth inch.

(4) Classification of Species of Wood. Table D-5 gives a list of native woods, divided into four groups on the basis of mechanical properties considered from the standpoint of use for ladder construction.

(a) All minimum dimensions and specifications set forth in (b)(ii) for side rails and flat steps are based on the species of wood listed in Group 3 in Table D-5 except where otherwise provided. The species of all other groups may be substituted for those of Group 3 when used in sizes that provide at least equivalent strength. (See Table D-5 for suggested methods of size adjustment.)

(b) All minimum dimensions and specifications set forth in the following "Factor for Increase In" for rungs and cleats are based on the species of wood listed in Group 1 in Table D-5. The cross-sectional dimensions specified for Group 1 species are increased by the factors shown in this subsection (based on the percentages of Table D-5) for the species group of which the cleats are to be made.

FACTOR FOR INCREASE IN

Species group	Each dimension	Width only (thickness unchanged)
1	1.00	1.00
2	1.03	1.05
3	1.11	1.19
4	1.17	1.26

(5) Metal Parts. All metal parts shall be made of aluminum, steel, wrought iron, malleable iron, or other material, adequate in strength for the purpose intended, and shall be properly coated and protected so as to be rust resistant. [Order 73-5, § 296-24-78005, filed 5/9/73 and Order 73-4, § 296-24-78005, filed 5/7/73.]

WAC 296-24-78007 Construction requirements. (1) Basis of Requirements. (a) Dimensions specified herein after for wood ladders are the minimum dressed cross-sectional dimensions for the types of ladders herein designated, based on the species of woods specified in WAC 296-24-78005(4), at a moisture content of 15 percent. The dimensions for side rails are based on a mortise or gain as specified for the various types of ladders for step or rung attachments. Where the strength of the side rails or back legs is reduced by a greater mortise or gain than shown, or where it is desired to use a cross section for any wood part either dimension of which is less than that specified, the required dimensions may be found as indicated in (1)(b) of this section.

(b) For the side rails of single extension and sectional ladders, the proposed section shall develop an actual stress per square inch not greater than 2,150 pounds for Group 1 woods, 2,000 pounds for Group 2 woods, 1,600 pounds for Group 3 woods, or 1,375 pounds for Group 4 woods when computed by the following formula applying to rectangular sections, with a maximum tolerance of 5 percent over these stresses:

$$S = \frac{3 LD (P+W/16)}{2B (D^3-d^3)} = \frac{1.5 LD (25+W/16)}{B (D^3-0.67)}$$

P = 25 pounds, which is the normal component on each rail of a load of 200 pounds at the center of the ladder, equally distributed between the rails, when the foot of the ladder is moved out of the perpendicular by one-quarter of its length.

S = Stress in extreme fiber in pounds per square inch.

W = Weight of ladder in pounds.

L = Maximum working length of ladder in inches.

B = Net thickness of each side rail in inches.

D = Depth of side rail in inches.

d = Diameter of hole board for rung (d³ shall be taken as not less than 0.67).

(c) Adjustment of sizes for wood parts of stepladders and other ladder types covered by this section may be made as follows:

(i) The dimensions specified in later sections for parts having rectangular cross sections generally represent only one of a number of possible combinations of thickness and width which could satisfy the requirements for strength and stiffness. Depending upon the material sizes available, manufacturing practices, and like factors, parts produced by a particular manufacturer may or may not agree exactly with the sizes given later. The following provisions provide means for determining equality of load-carrying capacity of parts of different sizes or of determining sizes needed to provide equality.

(ii) Any changes in dimensions shall result in a change in the width-thickness ratio for side rails of back legs not greater than 25 percent from the ratio for a corresponding ladder as now covered in this section.

(iii) Where both dimensions are different from those specified, the load-carrying capacity in bending of a part will be equal to or greater than that of a part of specified dimensions if the ratio P₂/P₁ is not less than 1, where

$$\frac{P_2}{P_1} = \frac{B_2 D_2^2}{B_1 D_1^2}$$

and

B = Dimension of the part at right angles to the direction of load (width of a step, thickness of a side rail or back leg).

D = Dimension of the part parallel to the direction of load (thickness of a step, width of a side rail or back leg).

B₁D₁ = Dimensions as specified

B₂D₂ = Dimensions of part being considered.

(iv) The dimensions to be used in the computations are net dimensions. For example, in the case of a step-ladder side rail, the dimension B is to be taken as the gross thickness of the rail minus the depth of the gain for the steps. Where there is a rung hole at the center of depth of a rail, a somewhat more accurate comparison may be made by the use of the formula

$$\frac{P_2}{P_1} = \frac{B_2 D_1 (D_2^3 - d^3)}{B_1 D_2 (D_1^3 - d^3)}$$

where the symbols have the same meanings as before and d is the diameter of the hole for the rung tenon. In most instances the difference in results calculated by this and by the earlier formula will be slight.

(2) Portable Stepladders. Stepladders longer than 20 feet shall not be supplied. Stepladders as hereinafter specified shall be of three types:

Type I—Industrial stepladder, 3 to 20 feet for heavy duty, such as utilities, contractors, and industrial use.

Type II—Commercial stepladder, 3 to 12 feet for medium duty, such as painters, offices, and light industrial use.

Type III—Household stepladder, 3 to 6 feet for light duty, such as light household use.

(a) General requirements. (i) Slope is the inclination of side rails or back legs with respect to the vertical and is expressed as a deviation from the vertical per unit length of the member. Stepladders shall be so constructed, that when in the open position, the slope of the front section shall not be less than 3 1/2 inches and the slope of the back section not less than 2 inches, for each 12-inch length of side rail.

(ii) A uniform step spacing shall be employed which shall be not more than 12 inches. Steps shall be parallel and level when the ladder is in position for use.

(iii) The minimum width between side rails at the top, inside to inside, shall be not less than 11 1/2 inches.

From top to bottom, the side rails shall spread at least 1 inch for each foot of length of stepladder.

(iv) When minimum thickness of side rails is used, steps shall be closely fitted into the grooves in the side rails one-eighth inch in depth with a tolerance of one thirty-second inch, and shall be firmly secured as hereinafter described; or they shall be closely fitted into metal brackets of an equivalent strength, which in turn shall be firmly secured to the side rails. The depth of groove herein provided may be increased in proportion to the thickness of side rails as provided in WAC 296-24-78007(2)(b), (c) and (d).

(v) All stepladders shall have a top with wood or metal brackets or fittings tightly secured to the top, side rails, and back legs, to allow free swinging of the back section without excessive play or wear at the joints.

(vi) A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in open positions shall be a component of each stepladder. The spreader shall have all sharp points covered or removed to protect the user. For Type III ladder, the pail shelf and spreader may be combined in one unit (the so-called shelf-lock ladder).

(vii) When measured along the front edge of the side rails, all stepladders shall measure within 3 inches of the specified length.

(viii) Where bucket shelves are provided, they shall be constructed to support a load of 25 pounds and shall be so fastened that they can be folded up when the ladder is closed.

(ix) All metal parts and fittings shall be securely attached by means of rivets, bolts, screws, or equivalent fasteners.

(b) Type I industrial stepladder. (i) The minimum dimensions of the parts of the Type I stepladder shall be as shown in Table D-2 when made of Group 2 or Group 3 woods.

(A) The minimum thickness of side rails provides for the cutting of a groove of one-eighth inch in depth with the tolerance indicated in WAC 296-24-78007(2)(a)(iv), and shall be increased when grooves of greater depth are used.

(ii) Steps shall be secured with at least two 6-d nails at each end, or the equivalent thereof. Each step shall be reinforced by a steel rod not less than 3/16 inch in diameter with standard commercial tolerances, which shall pass through metal washers of sufficient thickness and diameter on each end to prevent pressing—into the side rails, and a truss block which shall be fitted between the rod and the center of each step, or by a metal angle brace on each end firmly secured to the steps and side rails, or by construction of equivalent strength and safety. Where the rod reinforcement construction is used, the bottom step shall be provided further with a metal angle brace on each end which shall be securely attached to the bottom step and side rails. In addition, all steps 3 5/8 inches wide and 27 inches or more in overall length and all steps 4 1/4 inches wide and 32 inches or more in overall length shall be provided with a metal angle brace at each end securely attached to the step and side rail.

(iii) The back section shall be braced by one of the following methods:

(A) The back legs shall be braced with 1 1/8-inch diameter rungs of Group 1 woods (see Table D-5), or material of equivalent strength, having 7/8-inch diameter tenons or oval wood rungs, or rectangular wood rungs of equivalent strength, spaced not more than 12 inches apart. The back legs shall be bored with holes either extending through the legs or to within three-sixteenths inch of the outside face of the legs, the size of the hole to be such as to insure a tight fit for the rung. The shoulder of the rung shall be forced firmly against the leg, and the tenon secured in place with a nail, or the equivalent thereof, to prevent turning of the rungs. The back legs shall be braced by a metal angle brace on each side, securely fastened to the rung and the back legs, one rung to be braced for each 4 feet of length or fraction thereof, on ladders 4 feet or more in length, with braces required only on the bottom rung for ladders that are 4 feet or shorter. Where rungs are more than 28 inches in length between the back legs they shall be provided with center bearing consisting of a wood bar not less than 3/4 by 2 inches in a cross-section securely nailed to each rung passing through it and long enough to include each rung longer than 28 inches.

(B) The back leg shall be braced with horizontal wood bars of Group 1, 2, or 3 woods in Table D-5 and not less than 3/4 by 2 1/2 inches in cross-section, spaced not more than 12 inches apart. The ends of the bars shall fit into metal sockets of not less than 20-gauge (Manufacturers Standard) steel, or other material of equivalent strength, or into mortises of not less than one-eighth inch (tolerance of \pm one-thirty-second inch) in depth in the back legs. A steel rod not less than 3/16 inch in diameter with standard commercial tolerance shall pass through the back legs, the bar, and at each end through metal washers of sufficient diameter and thickness to prevent passing into the back legs. The back legs shall also be braced by a metal angle brace on each side, securely fastened to the bar and to the legs, one bar to be so braced for at least each 4 feet of length or fraction thereof, with braces required only on bottom bar for ladders that are 4 feet or shorter. Metal sockets when used shall be attached to the back legs by rivets or by means of a rod running through the socket or equivalent thereof.

(iv) The back legs shall be reinforced by a rivet through the depth of the leg above the hinge point, by metal plates or collars at the hinge point, or by other means suitable for preventing splitting of the back leg from the hinge pin to the top.

(c) Type II commercial stepladder. (i) The minimum dimensions of the parts of the Type II stepladder shall be as given in Table D-3 when made of Group 2 or Group 3 woods.

(A) The minimum thickness of side rails provides for the cutting of a groove of one-eighth inch in depth with the tolerance indicated in (2)(a)(iv), and shall be increased when grooves of greater depth are used.

(ii) Steps shall be secured with at least two 6-d nails at each end, or the equivalent thereof. Each step shall be

reinforced by a steel rod not less than 3/16 inch in diameter with standard commercial tolerances which shall pass through metal washers of sufficient thickness and diameter on each end to prevent pressing into the side rails, and a truss block shall be fitted between the truss rod and center of each step; or by a metal angle brace on each end firmly secured to the steps and side rails; or by construction of equivalent strength and safety. Where the rod reinforcement construction is used, the bottom step shall be provided further with a metal angle brace on each end which shall be securely attached to the bottom step and side rails. In addition all steps 27 inches or more in overall length shall be provided with a metal angle brace at each end securely attached to the step and side rails.

(iii) The back legs shall be braced by one of the three following methods:

(A) With 7/8-inch diameter wood dowels of Group 1 woods (see Table D-5) or material of equivalent strength having not less than 5/8-inch tenons firmly secured in the back legs and spaced not more than 12 inches apart. The back legs shall be bored with holes either extending through the legs or to within three-sixteenths inch of the outside face of the legs, the size of the hole to be such as to insure a tight fit for the dowel. The shoulder of the dowel shall be forced firmly against the leg and the tenon secured in place with a nail, or the equivalent thereof, to prevent turning of the dowel.

(aa) A bar connecting two or more of the dowels shall be provided on all ladders of 6 feet or more. The cross-sectional dimensions of the bar shall be the same as the cross-sectional dimensions of the back legs, and the dowels shall pass through holes at the centerline of the bar. The bar shall be attached at the center of the length of the lower two dowels on a 6-foot ladder and shall extend upward one dowel for each 2 feet of added length.

(B) With wood dowels as set forth in (2)(c)(iii)(A) of this section, plus an inverted V bracing of 3/4-inch by 1 1/2-inch material through which the dowels extend, the length of the V to extend two-thirds of the way up the back.

(C) With horizontal bracing of Group 1, 2, 3, or 4 woods (see Table D-5) not less than 3/4 by 2 inches in cross-section, the ends of which shall fit into metal sockets of not less than 20-gauge (Manufacturing Standard), steel, or other material of equivalent strength or into mortises not less than one-eighth inch in depth in back legs. The bars shall be reinforced by steel rods not less than 3/16 inch in diameter with standard commercial tolerances which shall pass through the back legs, the bar, and, at each end, through metal washers of sufficient diameter and thickness to prevent pressing into the back legs. The spacing of such braces shall not exceed 3 feet, and there shall be one brace on 3- and 4-foot ladders, two braces on 5- and 6-foot ladders, three braces on 7- and 8-foot ladders, and four braces on 10- and 12-foot ladders. The bottom bar shall not be more than 18 inches from the bottom of the ladder, and, where only one bar is used, it shall be braced by a metal angle brace on each end securely attached to the bar and the back leg.

(d) Type III household stepladder. (i) The minimum dimensions of the parts of the Type III stepladder shall be as follows when made of Group 2 or Group 3 woods.

	Length, 3 to 6 feet	
	Thickness (inch)	Depth (inches)
Side rails	3/4	2 1/2
Back legs	3/4	1 5/16
Steps	3/4	3
Top	3/4	5

The minimum thicknesses of side rails provide for the cutting of a groove one-eighth inch in depth with the tolerance indicated in WAC 296-24-78007(2)(a)(iv), and shall be increased when grooves of greater depth are used.

(ii) Steps shall be secured with at least one 6-d nail at each end, or the equivalent thereof. Each step shall be reinforced by a steel rod not less than 3/16 inch in diameter with standard commercial tolerance which shall pass through metal washers of sufficient thickness and diameter to prevent pressing into the side rails, or by a metal brace at each end firmly secured to steps and side rails or by construction of equivalent strength and safety. Where the rod reinforcement construction is used, the bottom step shall be provided further with a metal angle brace on each end which shall be securely attached to the bottom step and side rail.

(iii) Back legs shall be braced by one of the two following methods or by construction of equivalent strength and safety:

(A) By diagonal slates of groups 1, 2, 3, or 4 wood (see Table D-5) not less than 5/16 by 1 1/4 inches securely fastened to the back legs by nails, screws, or the equivalent thereof.

(B) With horizontal bracing of Groups 1, 2, 3, or 4 wood (see Table D-5) not less than 5/8 by 1 5/8 inches in cross section, the ends of which shall fit into metal sockets of not less than 20-gauge (Manufacturing Standard) steel or other material of equivalent strength or into mortises not less than one-eighth inch in depth in back legs. The bars shall be reinforced by steel rods not less than 3/16 inch in diameter with standard commercial tolerances which shall pass through the back leg, the bar, and at each end through metal washers of sufficient diameter and thickness to prevent pressing into each leg. The spacing of such bars shall not exceed 3 feet, and there shall be one brace on 3- and 4-foot ladders, two braces on 5- and 6-foot ladders. The bottom bar shall be not more than 18 inches from the bottom of the ladder.

(3) Portable Rung Ladders. Portable rung ladders as herein specified shall be of four types, as follows: single ladder; two-section extension ladder; section ladder; trestle and extension trestle ladder.

(a) General requirements. (i) The base or lower portion of a ladder may have either parallel sides or flared sides in accordance with commercial practice.

(ii) Rungs shall be parallel, level, and uniformly spaced. The spacing shall be not more than 12 inches, except as hereinafter specified.

TABLE D-2
DIMENSIONS FOR TYPE I STEP LADDER

Length, 12 feet and less		Length, 14 and 16 feet		Length, 18 and 20 feet	
Thickness (inch)	Depth (inches)	Thickness (inch)	Depth (inches)	Thickness (inch)	Depth (inches)
Side rails — 3/4	3 1/4	3/4	3 1/2	1 1/16	3 1/2
Back legs — 3/4	2 1/4	3/4	2 5/8	1 1/16	2 1/4
Steps — 3/4	3 5/8	3/4	4 1/4	3/4	4 1/4
Tops — 3/4	5 1/2	3/4	5 1/2	3/4	5 1/2

TABLE D-3
DIMENSIONS FOR TYPE II STEP LADDER

Length, 3 to 8 feet		Length, 10 feet		Length, 12 feet	
Thickness (inch)	Depth (inches)	Thickness (inch)	Depth (inches)	Thickness (inch)	Depth (inches)
Side rails — 3/4	2 5/8	3/4	2 5/8	3/4	3
Back legs — 3/4	1 5/8	3/4	1 3/4	3/4	2
Steps — 3/4	3 1/2	3/4	3 1/2	3/4	3 5/8
Tops — 3/4	5	3/4	5	3/4	5

(iii) All holes for wood rungs shall either extend through the side rails or be bored so as to give at least a thirteen-sixteenths-inch length of bearing to the rung tenon. In throughbored construction, the rungs shall extend at least flush with the outside rail surface. All holes shall be located on the center line of the wide face of the side rails and shall be of such size as to insure a tight fit for the rung. The shoulder of the rung shall be forced firmly against the side rails and the tenon secured in place with a nail or the equivalent thereof, for the sole purpose of preventing the turning of the rung and maintaining the rung position in the side rail. Ladders used with ladder jacks shall be a 3/16 inch metal tie rod immediately under each rung.

(iv) Round rungs shall be of Group 1 woods (see Table D-5), shall be not less than 1 1/8 inches in diameter for lengths over 36 inches between side rails and 1 1/4 inches in diameter for lengths over 36 up to and including 72 inches, and shall have not less than seven-eighths-inch-diameter tenons, or rungs of equivalent strength and bearing shall be provided. When rungs are 28 inches or more in length between side rails, they shall, in addition, be provided with center bearing.

(v) Oval rungs or rungs of any other cross section may be used provided they are secured by a nail at each end or the equivalent thereof, and have at least the same strength and bearing as round rungs of the same length.

(vi) All metal parts and fittings shall be securely attached by means of rivets, bolts, screws, or equivalent fasteners.

(vii) The construction and assembly of the movable parts shall be such that they shall operate freely and securely without binding or unnecessary play.

(viii) When measured along the side rails, no rung ladder or section thereof shall be more than 4 inches shorter than the specified length.

(ix) Nonslip bases shall be securely bolted, riveted, or attached by equivalent construction to the side rails.

(x) Hooks shall be securely bolted or riveted to the side rails or equivalent construction and shall be of such dimensions as to withstand the loads imposed upon them.

(b) Single ladder. (i) Single ladders longer than 30 feet shall not be supplied.

(ii) The minimum dimensions of the side rails of the single ladder shall be as follows when made of group 2 or group 3 woods:

Length of ladder (feet)	Thickness (inches)	Depth (inches)
Up to and including 16	1 1/8	2 1/2
Over 16 up to and including 22	1 1/4	2 3/4
Over 22 up to and including 30	1 1/4	3

(iii) Smaller side rails will be acceptable in all ladders of this type when reinforced by a steel wire, rod, or strap running the length of the side rails and adequately secured thereto. Where such reinforcement is used, the reinforced rails shall be equivalent in strength to the side rails specified in this WAC 296-24-78007(3)(b)(ii).

(iv) The width between the side rails at the base, inside to inside, shall be at least 11 1/2 inches for all ladders up to and including 10 feet. Such minimum widths shall be increased at least one-fourth inch for each additional 2 feet of length.

(c) Two-section ladder. (i) Two-section extension ladders longer than 60 feet shall not be supplied. All ladders of this type shall consist of two sections, one to fit within the side rails of the other, and arranged in such a manner that the upper section can be raised and lowered.

(ii) The minimum dimensions of the side rails of the two-section extension ladder shall be not less than specified in Table D-4.

(iii) The minimum dimensions of side rails set forth in Table D-4 are based on the maximum working length, which is the size of ladder less the minimum overlap, which shall be as follows:

Size of ladder (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

(iv) Smaller side rails will be acceptable in all ladders of this type when reinforced by a steel wire, rod, or strap running the length of the side rails and adequately secured thereto. Where such reinforcement is used, the reinforced rails shall be equivalent in strength to the side rails specified in Table D-4.

(v) The minimum distance between side rails of the bottom section, inside to inside, shall be 14 1/2 inches on ladders up to and including 28 feet; 16 inches on all ladders over 28 feet up to and including 40 feet; 18 inches on all ladders over 40 feet.

(vi) Rungs. Rungs shall be of White Oak, Ash, Hickory, or wood of equivalent strength not less than 1 1/8 inches in diameter with at least a 7/8 inch diameter tenon. Where the distance between side rails is more than 28 inches rungs shall be supported in the center. Holes for wood rungs shall either extend through the side rails or be bored to give at least a 13/16 inch length of bearing to the rung tenon. In throughbored construction the rungs shall extend at least flush with the outside rail surface. Holes shall be located on the center line of the wide face of the side rails and shall be of such size as to be a tight fit for the rung. The shoulder of the rung shall be forced firmly against the side rails and the tenon secured in place with a nail, or the equivalent thereof, to prevent turning. A 3/16 inch diameter tie rod shall be placed under each rung.

(vii) All locks and guide irons shall be of metal and shall be of such construction and strength as to develop the full strength of the side rails. All locks shall be positive in their action. The guide irons shall be securely attached and so placed as to prevent the upper section from tipping or falling out while raising, lowering, or in use.

(viii) Ladders of this type may be equipped with a rope and pulley, which shall be securely attached to the ladder in such manner as not to weaken either the rungs or the side rails. The pulley shall be not less than 1 1/4 inches in diameter.

(A) The rope used with the pulley shall be not less than five-sixteenths inch in diameter having a minimum breaking strength of 560 pounds, and shall be sufficient length for the purpose intended.

(d) Sectional ladder. (i) Assembled combinations of sectional ladders longer than lengths specified in (3)(d)(ii) shall not be used.

(ii) The minimum dimensions of side rails shall be as follows for Group 2 or Group 3 woods:

Assembled length of ladder (feet)	Thickness (inches)	Depth (inches)
Up to and including 21	1 1/8	2 3/4
Over 21 up to and including 31	1 1/8	3 1/8

TABLE D-4
DIMENSIONS OF SIDE RAILS FOR TWO-SECTION LADDER

Size of ladder, overall length (feet)	Rail	
	Thickness (inches)	Depth (inches)
For group 2 woods		
16	1 1/16	X 2
20	1 1/16	X 2 1/4
24	1 1/16	X 2 1/2
28	1 1/16	X 2 3/4
32	1 1/8	X 2 3/4
36	1 5/16	X 2 3/4
40	1 5/16	X 2 3/4
44	1 5/16	X 3
For group 3 woods		
16	1 1/8	X 2
20	1 1/8	X 2 1/4
24	1 1/8	X 2 1/2
28	1 1/8	X 2 3/4
32	1 5/16	X 2 3/4
36	1 5/16	X 3
40	1 3/8	X 3
44	1 3/8	X 3 1/4
48-52	1 3/8	X 3 3/4
56-60	1 5/8	X 3 3/4

(iii) Ladders of this type shall have either straight sides slightly converging toward the top of each section, or shall have flaring sides at the bottom of the first (or bottom) section, with the top section having converging side rails to a width that shall be not less than 4 inches. Except for the top section, the minimum width between side rails shall be 11 inches.

(A) Adjacent sections shall be jointed by means of a groove in the bottom end of each rail of the upper of the two sections setting firmly over extensions outside the side rails, of the topmost rung of the next lower section and, at the same time, a groove in the top end of each rail of the lower of the two sections setting firmly over the bottom rung, inside the side rails, of the section next above.

(B) The distance between the two rungs (top-most rung of one section, bottom rung of the section next above) mentioned in WAC 296-24-78007(3)(d)(iii)(A) shall not be less than 1 foot.

(C) The fit between rail grooves and rungs mentioned in WAC 296-24-78007(3)(d)(iii)(A) shall be such as to provide a good fit without binding or unnecessary play.

(D) The grooved ends of the sections shall be reinforced with a metal plate of not less than 18-gauge (Manufacturing Standard) material properly secured thereto, and a rivet adjacent to the groove, extending through the depth of the rail, or the equivalent thereof.

(e) Trestle and extension trestle ladder. (i) Trestle ladders, or extension sections or base sections of extension trestle ladders longer than 20 feet shall not be supplied.

(ii) The minimum dimensions of the side rails of the trestle ladder, or the base sections of the extension trestle ladder, shall be as follows for Group 2 or Group 3 woods.

Size of ladder (feet)	Thickness (inches)	Depth (inches)
Up to and including 16	1 5/16	2 3/4
Over 16 up to and including 20	1 5/16	3

The minimum dimensions of the side rails of the extension section of the extension trestle ladder, which shall have parallel sides, shall be as follows for Group 2 or Group 3 woods.

Size of ladder (feet)	Thickness (inches)	Depth (inches)
Up to and including 12	1 5/16	2 1/4
Over 12 up to and including 16	1 5/16	2 1/2
Over 16 up to and including 20	1 5/16	2 3/4

(iii) 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 at least 5 1/2 inches per foot of the length of the ladder.

(iv) The width between the side rails at the base of the trestle ladder and the base sections of the extension trestle ladder shall be at least 21 inches for all ladders and sections up to and including 6 feet. Longer lengths shall be increased at least 1 inch for each additional foot of length. The width between the side rails of the extension sections of the trestle ladder shall be not less than 12 inches.

(v) The tops of the side rails of the trestle ladder and of the base section of the extension trestle ladder shall be beveled or equivalent construction, and shall be provided further with a metal hinge to prevent spreading.

(vi) 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 all extension trestle ladders and all trestle ladders over 12 feet in length.

(vii) Rungs shall be parallel and level. On the trestle ladder, or on the base sections of the extension trestle ladder, rungs shall be spaced not less than 8 inches or

more than 18 inches apart; on the extension section of the extension trestle ladder, rungs shall be spaced not less than 6 inches or more than 12 inches apart.

(viii) Rungs. Rungs shall be of White Oak, Ash, Hickory, or wood of equivalent strength not less than 1 1/8 inches in diameter with at least a 7/8 inch diameter tenon. Where the distance between side rails is more than 28 inches rungs shall be supported in the center. Holes for wood rungs shall either extend through the side rails or be bored to give at least a 13/16 inch length of bearing to the rung tenon. In throughbored construction the rungs shall extend at least flush with the outside rail surface. Holes shall be located on the center line of the wide face of the side rails and shall be of such size as to be a tight fit for the rung. The shoulder of the rung shall be forced firmly against the side rails and the tenon secured in place with a nail, or the equivalent thereof, to prevent turning. A 3/16 inch diameter tie rod shall be placed under each rung.

(4) Special-purpose Ladders. All special-purpose ladders shall comply with the appropriate requirements of WAC 296-24-78007(1), (2) and (3), except as herein-after modified in this subsection.

(a) Platform stepladder. A platform stepladder is a modification of a portable stepladder with a working platform provided near the top.

(i) Platform stepladders shall be made in accordance with the requirements of type I stepladders or in accordance with the requirements for type II stepladders.

(ii) The slope of the back section shall be such that a vertical from the back edge of the platform will strike the floor at a distance measured toward the front section of not less than 3 inches from the base of the back section.

(iii) The minimum width between side rails at the platform shall be not less than 15 inches.

(iv) The back legs and side rails shall extend at least 24 inches above the platform and shall be connected with a top member to form a three-sided rail, or equivalent construction shall be provided.

(v) Platforms shall be so constructed as to be capable of supporting a load of 200 pounds placed at any point on the platform.

(vi) A separate spreader may be omitted from platform ladders in which the height to the platform is 6 feet or less. If the spreader is omitted, the platform shall be so designed as to function as a spreader or locking device to hold the front and back sections securely in an open position, with the connection between side rails and back legs being through the metal parts of the platform. The wood parts of a combined wood and metal platform functioning as a spreader shall not be depended upon to contribute to the spreading or locking action.

(b) Painter's stepladder. (i) Painter's stepladders longer than 12 feet shall not be supplied.

(ii) Painter's stepladders shall be made in accordance with the requirements of type II stepladders except for the following:

(A) The top may be omitted.

(B) A rope spreader may be substituted for the metal spreader required in WAC 296-24-78007(2)(a)(vi). The

rope shall not be less than No. 6 sash cord or its equivalent.

(c) Mason's ladder. A mason's ladder is a special type of single ladder intended for use in heavy construction work.

(i) Mason's ladders longer than 40 feet shall not be supplied.

(ii) The minimum dimensions of the side rails when made of Group 2 or Group 3 woods and rungs (Group 1 woods) of the mason's ladder shall be as follows:

Length of ladder (feet)	Side rails		Diameter	
	Thickness (inches)	Depth (inches)	Rung (inches)	Tenon (inches)
Up to and including 22 —	1 5/8	3 5/8	1 3/8	1
Over 22 up to and including 40 —	1 5/8	4 1/2	1 3/8	1

(iii) The width between the side rails at the bottom rung, inside to inside, shall be not less than 12 inches for all ladders up to and including 10 feet. Such minimum widths shall be increased by at least one-fourth inch for each additional 2 feet of length.

(iv) Rungs shall be parallel and level and shall be spaced not less than 8 inches or more than 12 inches apart.

(5) Trolley and Side-rolling Ladders. (a) Length. Trolley ladders and side-rolling ladders longer than 20 feet should not be supplied.

(b) Dimensions. The dimensions of the side rails shall not be less than the following for Group 2 or Group 3 woods.

Length of side rails (feet)	Thickness (inch)	Depth (inches)
Up to and including 10	3/4	3
Over 10 up to and including 20 —	3/4	3 3/4

The minimum thicknesses of side rails provide for the cutting of a groove not over one-eighth inch in depth and shall be increased when grooves of greater depth are used. Flat steps shall have the following minimum dimensions for Group 2 or Group 3 woods.

Length of side rails (feet)	Thickness (inch)	Depth (inches)
Up to and including 16	3/4	3
Over 16 up to and including 20 —	3/4	3 1/4
Over 20 up to and including 24 —	3/4	3 1/2
Over 24 up to and including 28 —	3/4	4

(c) Width. The width between the side rails, inside to inside, shall be at least 12 inches.

(d) Step attachment. Flat steps shall be inset in the side rails one-eighth inch and secured with at least two 6-d nails at each end or the equivalent thereof. They shall be reinforced with angle braces or a 3/16-inch steel rod.

(e) Locking device. Locking devices should be provided on all trolley ladders.

(f) Tracks. (i) Tracks shall be wood, or metal (excluding cast iron), or a combination of these materials.

(ii) Tracks for the top end of ladders shall be fastened securely and shall be so constructed that the wheels will not jump the track. Tracks shall be so designed as to provide for all probable loads to which they will be subjected.

(iii) The supports shall be securely fastened by the lag screws, machine, hook, or toggle bolts, or their equivalent.

(iv) Track for side-rolling ladders shall be supported by metal or wood brackets securely screwed or bolted to shelving or other permanent structure at not over 3 feet.

(g) Wheel carriages. (i) Wheel carriages shall be so designed as to provide for all loads to which they will be subjected. Two-point suspension should be used.

(ii) The wheel carriage for the top end of the ladder shall be securely fastened to the top of the ladder with metal brackets bolted either to the side rails or to the top step. When bolted to the top step, this step shall be secured to the side rails with metal braces in addition to those otherwise provided. The wheel carriage shall be so designed that a loose or broken wheel will not allow the ladder to drop or become detached from the track.

(iii) The wheel carriage for the bottom end of the ladder shall be securely fastened to the bottom of the ladder.

(iv) The wheels at the upper end of the ladder shall have minimum wheel base of 8 inches.

(v) When wheels are used at the bottom of the ladder, there shall be at least one wheel supporting each side rail.

(vi) Running gear for bottoms of both trolley and side-rolling ladders shall be so designed and constructed as to provide for any load to which they will be subjected. [Order 73-5, § 296-24-78007, filed 5/9/73 and Order 73-4, § 296-24-78007, filed 5/7/73.]

WAC 296-24-78009 Care and use of ladders. (1) Care. To insure safety and serviceability the following precautions on the care of ladders shall be observed:

(a) Ladders shall be maintained in good condition at all times, the joint between the steps and side rails shall be tight, all hardware and fittings securely attached, and the moveable parts shall operate freely without binding or undue play.

(b) Metal bearings of locks, wheels, pulleys, etc., shall be frequently lubricated.

(c) Frayed or badly worn rope shall be replaced.

(d) Safety feet and other auxiliary equipment shall be kept in good condition to insure proper performance.

(e) Ladders should be stored in such a manner as to provide ease of access or inspection, and to prevent danger of accident when withdrawing a ladder for use.

(f) Wood ladders, when not in use, should be stored at a location where they will not be exposed to the elements, but where there is good ventilation. They shall not be stored near radiators, stoves, steam pipes, or other places subjected to excessive heat or dampness.

(g) Ladders stored in a horizontal position should be supported at a sufficient number of points to avoid sagging and permanent set.

(h) Ladders carried on vehicles should be adequately supported to avoid sagging and securely fastened in position to minimize chafing and the effects of road shocks.

(i) Ladders should be kept coated with a suitable protective material. The painting of ladders is satisfactory providing the ladders are carefully inspected prior to painting by competent and experienced inspectors acting for, and responsible to, the purchaser, and providing the ladders are not for resale.

(j) Ladders shall be inspected frequently and those which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous, Do Not Use".

(k) Rungs should be kept free of grease and oil.

(2) Use. The following safety precautions shall be observed in connection with the use of ladders:

(a) Portable rung and cleat ladders shall, where possible, be used at such a pitch that the horizontal distance from the top support to the foot of the ladder is one-quarter of the working length of the ladder (the length along the ladder between the foot and the top support). The ladder shall be so placed as to prevent slipping, or it shall be lashed, or held in position. Ladders shall not be used in a horizontal position as platforms, runways, or scaffolds;

(b) Ladders for which dimensions are specified should not be used by more than one man at a time nor with ladder jacks and scaffold planks where use by more than one man is anticipated. In such cases, specially designed ladders with larger dimensions of the parts should be procured;

(c) Portable ladders shall be so placed that the side rails have a secure footing. The top rest for portable rung and cleat ladders shall be reasonably rigid and shall have ample strength to support the applied load;

(d) Ladders shall not be placed in front of doors opening toward the ladder unless the door is blocked open, locked, or guarded.

(e) Ladders shall not be placed on boxes, barrels, or other unstable bases to obtain additional height;

(f) To support the top of the ladder at a window opening, a board should be attached across the back of the ladder, extending across the window and providing firm support against the building walls or window frames;

(g) When ascending or descending, the user should face the ladder;

(h) Ladders with broken or missing steps, rungs, or cleats, broken side rails, or other faulty equipment shall not be used; improvised repairs shall not be made.

(i) Short ladders shall not be spliced together to provide long sections;

(j) Ladders made by fastening cleats across a single rail shall not be used;

(k) Ladders shall not be used as guys, braces, or skids, or for other than their intended purposes;

(l) Tops of the ordinary types of stepladders shall not be used as steps;

(m) On two-section extension ladders the minimum overlap for the two sections in use shall be as follows:

Size of ladder (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

(n) Portable rung ladders with reinforced rails (see WAC 296-24-78007(3)(iii) and (iv)) shall be used only with the metal reinforcement on the under side. Ladders of this type should be used with great care near electrical conductors, since the reinforcing itself is a good conductor;

(o) No ladder should be used to gain access to a roof unless the top of the ladder shall extend at least 3 feet above the point of support, at eave, gutter, or roof line;

(p) Adjustment of extension ladders should only be made by the user when standing at the base of the ladder, so that the user may observe when the locks are properly engaged. Adjustment of extension ladders from the top of the ladder (or any level over the locking device) is a dangerous practice and should not be attempted. Adjustment should not be made while the user is standing on the ladder.

(q) Middle and top sections of sectional or window cleaner's ladders should not be used for bottom section unless the user equips them with safety shoes.

(r) Extension ladders should always be erected so that the upper section is resting on the bottom section.

(s) The user should equip all portable rung ladders with nonslip bases when there is a hazard of slipping. Nonslip bases are not intended as a substitute for care in safety placing, lashing, or holding a ladder that is being used upon oily metal, concrete, or slippery surfaces.

(t) The bracing on the back legs of step ladders is designed solely for increasing stability and not for climbing.

(u) When service conditions warrant, hooks may be attached at or near the top of portable ladders to give added security.

(v) Stepladders shall not be used as single ladders.

(w) Separate ladders for ascending and descending shall be provided in building construction of more than 2 stories in height, or where traffic is heavy.

(x) Where one broad ladder is used, a center rail shall be provided, and each side plainly marked "up" and "down".

(y) Ladder rungs shall not be used to support more than 1 section of plank, and not more than 2 men shall work on such section of planking at one and the same time. When 2 men are working on the same section of plank, their work should be so arranged that their weight is equally distributed between 2 ladders as nearly as possible.

(z) When ladders are used of a length sufficient to possess a tendency to spring when weight is applied, they shall be provided with bracing to overcome same. This applies particularly to extension ladders.

(a1) Before climbing ladders, workmen shall see that their shoes are free and clean of greasy or slippery substances.

(b1) When working from a stepladder over 5 feet high a workman shall not stand on a step higher than the third step from the top of the stepladder.

(c1) Ladders shall not be placed or used in elevator shafts or hoistways except where used by workmen engaged in work within such shafts or hoistways, and then they shall be protected from objects falling from operations at higher elevations in or adjoining the shaft.

(d1) Workmen shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(e1) Ladders shall pass the following test:

When tested as a simple beam with a support under each end and the center rung loaded with a 200 pound load, the ladder must support this load for 10 minutes without permanent set and without showing any sign of failure. The maximum deflection shall not be greater than shown in the enclosed table.

Lengths of extended ladder in feet	Distance of supports from ends, in inches	Total deflection, in inches
12	3	2 3/4
16	3	6 3/4
20	3	11 1/2
24	3	16 1/2
28	3	21 1/2
30	3	23 1/2
34	6	26
36	6	29
40	6	37
44	9	41

TABLE D-5

CLASSIFICATION OF VARIOUS SPECIES OF WOOD ACCEPTABLE FOR USE IN LADDER

The species are listed alphabetically within each group. The position of any species within a group therefore bears no relation to its strength or acceptability.

Where ladders are desired for use under conditions favorable to decay, it is recommended that the heartwood of decay-resistant species be used, or that the wood be given a treatment with a wood preservative. The species having the most durable heartwood are marked with an asterisk (*), and these should be preferred where resistance to decay is required.

GROUP 1

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed 2,150 pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions may be not more than 10 percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may not be more than 15 percent smaller if used edgewise (as in a rail) or 25 percent smaller if used flatwise (as in a tread).

- White ash ————— Fraxinus americana, pennsylvanica, quadrangulata
- Beech ————— Fagus grandifolia
- Birch ————— Betula lenta, alleghaniensis, nigra (2)
- Rock elm ————— Ulmus thomasii
- Hickory ————— Carya ovata, laciniosa, tomentosa, glabra
- Locust* ————— Robinia pseudoacacia, Gleditsia triacanthos
- Hard maple ————— Acer nigrum, saccharum
- Red maple ————— Acer rubrum (3)
- Red oak ————— Quercus velutina, marilandica, kelloggii, falcata var. pagodaefolia, laurifolia, ellipsoidal, rubra, nuttallii, palustris, coccinea, shumardii, falcata, laevis, phellos
- White oak ————— Quercus arizonica, douglasii, macrocarpa, lobata, prinus, muehlenbergii, emoryi, gambelii, oblonifolia, virginiana, garryana, lyrata, stellata, michauxii, bicolor, alba
- Pecan ————— Carya illinoensis, cordiformis, myristicaeformis (4), aquatica (4)
- Persimmon ————— Diospyros virginiana

GROUP 2

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed 2,000 pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions may be not more than 7 1/2 percent smaller for each cross-section dimension, or the thickness may remain unchanged, in which case the width may be not more than 11 percent smaller if used edgewise (as in a rail) or 20 percent smaller if used flatwise (as in a tread).

- Douglas fir (coast region) ————— Pseudotsuga menziesii
- Western larch ————— Larix occidentalis
- Southern yellow pine ————— Pinus taeda, palustris, echinata, elliotii, rigida, virginiana

GROUP 3

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed 1,600 pounds per square inch.

- Red alder ————— Alnus rubra, rhombifolia (2)
- Oregon ash ————— Fraxinus latifolia
- Pumpkin ash ————— Fraxinus profunda
- Alaska cedar* ————— Chamaecyparis nootkatensis
- Port Orford cedar* — Chamaecyparis lawsoniana
- Cucumber ————— Magnolia acuminata
- Cypress* ————— Taxodium distichum
- Soft elm ————— Ulmus americana, rubra
- Douglas fir (Rocky Mountain type) — Pseudotsuga menziesii var. glauca
- Noble fir ————— Abies procera
- Gum ————— Liquidambar styraciflua

West coast hemlock—	<i>Tsuga heterophylla</i>
Magnolia —————	<i>Magnolia grandiflora</i>
Oregon maple ———	<i>Acer macrophyllum</i>
Norway pine ———	<i>Pinus resinosa</i>
Poplar —————	<i>Liriodendron tulipifera</i>
Redwood* —————	<i>Sequoia sempervirens</i>
Eastern spruce ———	<i>Picea glauca, rubens</i>
Sitka spruce ———	<i>Picea sitchensis</i>
Sycamore —————	<i>Platanus occidentalis</i>
Tamarack —————	<i>Larix laricina</i>
Tupelo —————	<i>Nyssa aquatica, sylvatica</i>

GROUP 4

The allowable fiber stress in bending for the species listed herein when used for side rails shall not exceed 1,375 pounds per square inch. These species may be substituted for Group 3 woods on the following basis: The dimensions shall be at least 5 percent greater for each cross-section dimension, or the thickness may remain unchanged, in which case the width shall be at least 7 1/2 percent greater if used edgewise (as in a rail) or 15 percent greater if used flatwise (as in a tread).

Aspen —————	<i>Populus tremuloides, grandidentata</i>
Basswood —————	<i>Tilia americana, heterophylla</i> (2)
Buckeye —————	<i>Aesculus octandra, glabra</i> (2)
Butternut —————	<i>Juglanscinerea</i>
Incense cedar* ———	<i>Libocedrus decurrens</i>
Western red cedar* —	<i>Thuja plicata</i>
Cottonwood —————	<i>Populus balsamifera, deltoides, sargentii, heterophylla</i>
White fir —————	<i>Abies concolor, grandis, amabilis, lasiocarpa, magnifica</i>
Hackberry —————	<i>Celtis occidentalis, laevigata</i> (2)
Eastern hemlock ———	<i>Tsuga canadensis</i>
Holly —————	<i>Ilex opaca</i>
Soft maple —————	<i>Acer saccharinum</i>
Lodgepole pine ———	<i>Pinus contorta</i>
Idaho white pine ———	<i>Pinus monticola</i>
Northern white pine —	<i>Pinus strobus</i>
Ponderosa pine ———	<i>Pinus ponderosa, pinus jeffreyi</i> (Jeffrey pine)
Sugar pine —————	<i>Pinus lambertiana</i>
Engelmann spruce ———	<i>Picea engelmannii</i>

NOTE 1: The common and scientific names of species used conform to the American Lumber Standards nomenclature and in most cases to U.S. Department of Agriculture Handbook No. 41, "Check List of Native and Naturalized Trees of the United States (including Alaska)," by Elbert L. Little. These publications can be obtained from the Superintendent of Documents, Washington D.C. 20225.

NOTE 2: This species is commonly associated with others of the same genus under American Lumber Standards nomenclature, but no strength tests have been made on it at the Forest Products Laboratory.

NOTE 3: Included under soft maple in American Lumber Standards nomenclature.

NOTE 4: This species is not included under this common name in American Lumber Standards nomenclature, but strength data are available and it is accordingly included in this classification.

[Order 76-6, § 296-24-78009, filed 3/1/76; Order 73-5, § 296-24-78009, filed 5/9/73 and Order 73-4, § 296-24-78009, filed 5/7/73.]

WAC 296-24-795 Portable metal ladders. [Order 73-5, § 296-24-795, filed 5/9/73 and Order 73-4, § 296-24-795, filed 5/7/73.]

[Title 296 WAC—p 552]

WAC 296-24-79501 Terms. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-79503 through WAC 296-24-79507 unless the context requires otherwise. (1) Ladder. A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

(2) Step Ladder. A step ladder is a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Its size is designated by the overall length of the ladder measured along the front edge of the side rails.

(3) Single Ladder. A single ladder is a non-self-supporting portable ladder, nonadjustable in length, consisting of but one section. Its size is designated by the overall length of the side rail.

(4) Extension Ladder. An extension ladder is a non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

(5) Platform Ladder. A self-supporting ladder of fixed size with a platform provided at the working level. The size is determined by the distance along the front rail from the platform to the base of the ladder.

(6) Sectional Ladder. A sectional ladder is a non-self-supporting portable ladder, nonadjustable in length, consisting of two or more sections so constructed that the sections may be combined to function as a single ladder. Its size is designated by the overall length of the assembled sections.

(7) Trestle Ladder. A trestle ladder is a self-supporting portable ladder, nonadjustable in length, consisting of two sections, hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

(8) Extension Trestle Ladder. An extension trestle ladder is a self-supporting portable ladder, adjustable in length, consisting of a trestle ladder base and a vertically adjustable single ladder, with suitable means for locking the ladders together. The size is designated by the length of the trestle ladder base.

(9) Special-purpose Ladder. A special-purpose ladder is a portable ladder which represents either a modification or a combination of design or construction features in one of the general-purpose types of ladders previously defined, in order to adapt the ladder to special or specific uses. [Order 73-5, § 296-24-79501, filed 5/9/73 and Order 73-4, § 296-24-79501, filed 5/7/73.]

WAC 296-24-79503 Requirements. (1) General. Specific design and construction requirements are not part of this section because of the wide variety of metals and design possibilities. However, the design shall be such as to produce a ladder without structural defects or accident hazards such as sharp edges, burrs, etc. The metal selected shall be of sufficient strength to meet the test requirements, and shall be protected against corrosion unless inherently corrosion-resistant.

(a) Because of the varied conditions, and the wide variety of ladder uses, ladders may be designed with parallel side rails, with side rails varying uniformly in separation along the length (tapered), or with side rails flaring at the base to increase stability.

(b) The design of the side rails shall be such as to insure a product which will conform to the requirements of this section.

(c) The spacing of rungs or steps shall be on 12-inch centers.

(d) Rungs or steps to side rail connections should be so constructed as to insure rigidity as well as strength.

(e) Rungs and steps shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.

(f) Hardware shall meet strength requirements of the ladder's component parts, and shall be of a material that is protected against corrosion unless inherently corrosion-resistant. Metals shall be so selected as to avoid excessive galvanic action.

(2) General Specifications—Straight and Extension Ladders. (a) The minimum width between side rails of a straight ladder or any section of an extension ladder shall be 12 inches.

(b) The length of single ladders or individual sections of ladders shall not exceed 30 feet. Two-section ladders shall not exceed 48 feet in length and over two-section ladders shall not exceed 60 feet in length.

(c) Based on the nominal length of the ladder, each section of a multisection ladder shall overlap the adjacent section by at least the number of feet stated in the following:

Nominal length of ladder (feet):	Overlap (feet)
Up to and including 36 _____	3
Over 36, up to and including 48 _____	4
Over 48, up to 60 _____	5

(d) Extension ladders shall be equipped with positive stops which will insure the overlap specified in the table above.

(e) Extension ladders may be equipped with a rope and pulley which shall be securely attached to the ladder in such a manner as not to weaken either the rungs or the side rails. The pulley shall be not less than 1 1/4 inches in diameter.

(i) The rope used with the pulley shall be not less than five-sixteenths inch in diameter, having a minimum breaking strength of 560 pounds, and shall be of sufficient length for the purpose intended.

(3) General Specifications—Step Ladders. (a) Step ladders shall be designed and constructed to give a minimum slope of 3 1/2 inches per foot of length of the front section, and a minimum slope of 2 inches per foot of length of the back section, except that special ladders designed for straight-in-wall work shall maintain at least 1 1/4-inch back slope per foot of length.

(b) The minimum width between the side rails at the top step shall be 12 inches. The width spread of the side rails shall increase a minimum of 1 inch per foot of

length. The width of the step or tread shall not be less than 3 inches.

(c) The length of a stepladder is measured by the length of the front rail. To be classified as a standard length ladder, the measured length shall be within plus or minus one-half inch of the specified length. Stepladders shall not exceed 20 feet in length.

(d) The pail shelf shall be designed to fold completely within the ladder.

(e) The back section may be designed with either rungs or cross bracing as long as it meets the general and testing requirements.

(f) Steps shall be corrugated, knurled, dimpled, coated with skid-resistant materials, or otherwise treated to minimize the possibility of slipping.

(g) The bottoms of the four rails are to be supplied with insulating nonslip material.

(h) A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position shall be a component of each stepladder. The spreader shall have all sharp points or edges covered or removed.

(4) General Specifications—Trestles and Extension Trestle Ladders. (a) Trestle ladders or extension sections or base sections of extension trestle ladders shall be not more than 20 feet in length.

(b) The minimum distance between side rails of the trestle or extension section at the narrowest point shall not be less than 12 1/2 inches. The width spread shall not be less than 1 inch per foot of length of side rail.

(c) Spread of base when section is open shall not be less than 5 1/2 inches per foot of base section side rail.

(d) The extension locking device shall be designed to withstand all load tests.

(e) A metal spreader or locking device of sufficient size and strength to securely hold the front and back sections in the open position shall be a component of each trestle ladder. The spreader shall have all sharp points or edges covered or removed.

(5) General Specifications—Platform Ladders. (a) The length of a platform ladder shall not exceed 20 feet. The length of a platform ladder shall be measured along the front rail from the floor to the platform.

(b) Minimum width between side rails at platform level shall be 14 inches. Width spread shall not be less than 1 inch per foot of rise.

(c) Slope of the front rail when unit is in open position shall not be less than 3 1/2 inches per foot of rise, and the back section shall have a minimum slope of 1 inch per foot of rise.

(d) The platform shall be at least 20 inches from the top of the ladder, and shall have an area of not less than 200 square inches nor more than 400 square inches.

(e) The back legs and side rails of a platform ladder shall extend at least 20 inches above the platform and shall be connected with the top member to form a three-sided top guard rail, or equivalent construction shall be provided.

(f) Spreaders shall be provided where the hinging apparatus is not designed to lock the unit open. [Order 73-5, § 296-24-79503, filed 5/9/73 and Order 73-4, § 296-24-79503, filed 5/7/73.]

WAC 296-24-79505 Testing. (1) General. The following tests are intended to insure uniform testing methods for metal ladders.

(2) Straight and Extension Ladders. (a) Ladder inclined strength is measured by placing the ladder unit in a flat, horizontal position, supported 6 inches from the ends of the side rails. When testing extensions, the unit is opened to the required overlap. A load of 200 pounds is applied equally to the side rails at the center of the unit by means of a beam. The ladder must withstand this test with no permanent deformation or other visible weakening of the structure. This test is based on a 200-pound man using the ladder, set at 75 1/2° to the ground. With the man on the center rung, the component of his 200-pound weight at right angles to the ladder will be 50 pounds. Applying the load factor of 4, the test weight becomes 200 pounds.

(b) Test unit need only be of sufficient length for test purposes and is to consist of the base and fly sections of an extension ladder with all the hardware or fittings attached. The ladder unit is placed in a vertical position and a downward load of 775 pounds equally distributed on the ends of the side rails of the upper portion of the test unit. The unit shall withstand this test with no permanent deformation or other visible weakening of the structure.

(c) A test unit of at least three rungs is to be used from the maximum width portion of the ladder. A load of 800 pounds shall be applied to a 3 1/2-inch wide block resting on the center of the widest rung. A rung of 14 inches or less in length shall withstand this test with no permanent deformation or other visible weakening of the structure. A rung of more than 14 inches in length may have a permanent deflection of not more than one-eighth inch provided the rung cross section is not deformed and there is no other visible weakening of the structure.

(d) With at least a three-rung test unit set in a vertical position, a load of 800 pounds shall be applied to a 3 1/2-inch wide block resting on the center rung as near to the side rail as possible. On removing the load, the unit must show no indication of failure in the fasteners attaching the rungs to the side rail.

(e) The rung shall be so secured to the side rail that a torque load of 360 inch-pounds applied to the rung at a side rail shall cause no visible relative motion between the rung and the side rail.

(f) With the ladder extended to its maximum working length, and resting horizontally on level supports located 6 inches from each end of the ladder, a weight of 50 pounds shall be suspended from one of the side rails midway between supports.

The deflection of the loaded rail, and the difference in deflection between the loaded and unloaded rails shall not exceed the values in Table D-6.

(g) Deflections in Table D-6 are to be determined by measuring, at the midpoint between supports, the distance from the outside edges of both rails to the floor or other reference surface both before and after the test load of 50 pounds is applied to one rail of the ladder.

The test is to be repeated loading the other rail of the ladder. The angle (a) between the loaded and unloaded rails and the horizontal is to be calculated from the trigonometric equation:

$$\text{Sine } a = \frac{\text{Difference in deflection}}{\text{Ladder width}}$$

TABLE D-6
TABLE OF DEFLECTIONS

Length of ladder in feet	Maximum deflection of loaded rail in inches	Maximum difference in deflection between loaded and unloaded rails in degrees from horizontal
20	3.0	3.6
24	3.8	4.7
28	4.6	5.4
32	5.5	5.7
36	6.4	6.1
40	7.2	6.5
44	8.0	6.5
48	8.8	6.5

(3) Step, Trestle, Extension Trestle, and Platform Ladders. (a) Load test of the entire ladder is made with the ladder in an open position, and an 800-pound load applied to the center of the top. Resistance to side rail bending is tested by placing an 800-pound load on the center of the middle step. The strength of the step section is tested by applying an 800-pound load to a 3 1/2-inch-wide block resting on the center of the longest or bottom step. The pail shelf shall be so constructed as to support a distributed load of 50 pounds.

(i) In each test case, the unit must withstand the load without failure or permanent deformation.

(b) Set ladder in open position on a level floor. Place a 200-pound distributed load on the top step. The ladder is then subjected to a horizontal pulling load, applied at the top step, of 12-pound force to the side; 58-pound force to the front; 33-pound force to the back. In each test, all side rails must remain on the floor. [Order 73-5, § 296-24-79505, filed 5/9/73 and Order 73-4, § 296-24-79505, filed 5/7/73.]

WAC 296-24-79507 Care and maintenance and use of ladders. (1) General. To get maximum serviceability, safety, and to eliminate unnecessary damage of equipment, good safe practices in the use and care of ladder equipment shall be employed by the users.

The following rules and regulations are essential to the life of the equipment and the safety of the user.

(2) Care of Ladders. (a) Ladders, shall be handled with care and not subject to unnecessary dropping, jarring, or misuse. (They are designed for a specific purpose or use; therefore, any variation from this use constitutes a mishandling of the equipment.)

(b) Ladders shall be stored on racks designed to protect the ladder when not in use. The racks shall have sufficient supporting points to prevent any possibility of excessive sagging.

(c) Ladders transported on vehicles shall be properly supported. Supporting points shall be of a softer material, such as hardwood or rubber-covered iron pipe, to minimize the chafing and effects of road shock. (Tying the ladder to each support point will greatly reduce damage due to road shock.)

(d) Ladders shall be maintained in good usable condition at all times. Hardware fittings and accessories shall be checked frequently and kept in good working condition.

(e) Ropes or cables shall be inspected frequently and replaced if defective.

(f) Complete ladder inspection shall be periodical. If a ladder is involved in any of the following, immediate inspection is necessary:

(i) If ladders tip over, inspect ladder for side rails dents or bends, or excessively dented rungs; check all rung-to-side-rail connections; check hardware connections; check rivets for shear.

(ii) If ladders are exposed to excessive heat as in the case of fire, the ladder should be inspected visually for damage and tested for deflection and strength characteristics. In doubtful cases, refer to manufacturer.

(iii) If ladders are to be subjected to certain acids or alkali solutions, a protective coating such as asphalt and varnish should be applied to the equipment.

(iv) If ladders are exposed to oil and grease, equipment should be cleaned of oil, grease, or slippery materials. This can easily be done with a solvent or steam cleaning.

(g) Ladders having defects are to be marked and taken out of service until repaired by either maintenance department or the manufacturer.

(3) Use of Ladders. (a) Portable non-self-supporting ladders shall be erected at a pitch of 75 1/2 degrees for maximum balance and strength. (A simple rule for setting up a ladder at the proper angle is to place the base a distance from the vertical wall equal to one-fourth the working length of the ladder.)

NOTE: Portable ladders are designed as a one-man working ladder based on a 200-pound load.

(b) Workmen shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands.

(c) The ladder base section must be placed with a secure footing. Safety shoes of good substantial design should be installed on all ladders. Where ladders with no safety shoes or spikes are used on hard, slick surfaces, a foot-ladder board should be employed.

(d) The top of the ladder must be placed with the two rails supported, unless equipped with a single support

attachment. Such an attachment should be substantial and large enough to support the ladder under load.

(e) When ascending or descending, the climber must face the ladder.

(f) Ladders must not be tied or fastened together to provide longer sections. They must be equipped with the hardware fittings necessary if the manufacturer endorses extended uses.

(g) Ladders should not be used as a brace, skid, guy or gin pole, gangway, or for other uses than that for which they were intended, unless specifically recommended for use by the manufacturer.

(h) Users are cautioned to take proper safety measures when metal ladders are used in areas containing electric circuits to prevent short circuits or electrical shock. The ordinary precautions should be employed as would be used when using any other metal tool. [Order 76-6, § 296-24-79507, filed 3/1/76; Order 73-5, § 296-24-79507, filed 5/9/73 and Order 73-4, § 296-24-79507, filed 5/7/73.]

WAC 296-24-810 Fixed ladders. [Order 73-5, § 296-24-810, filed 5/9/73 and Order 73-4, § 296-24-810, filed 5/7/73.]

WAC 296-24-81001 Definitions. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-81003 through WAC 296-24-81007 unless the context requires otherwise. (1) Ladder. A ladder is an appliance usually consisting of two side rails joined at regular intervals by crosspieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

(2) Fixed Ladder. A fixed ladder is a ladder permanently attached to a structure, building, or equipment.

(3) Individual-rung Ladder. An individual-rung ladder is a fixed ladder each rung of which is individually attached to a structure, building, or equipment.

(4) Rail Ladder. A rail ladder is a fixed ladder consisting of side rails joined at regular intervals by rungs or cleats and fastened in full length or in sections to a building, structure, or equipment.

(5) Railings. A railing is any one or a combination of those railings constructed in accordance with WAC 296-24-75003 through WAC 296-24-75011. A standard railing is a vertical barrier erected along exposed edges of floor openings, wall openings, ramps, platforms, and runways to prevent falls of persons.

(6) Pitch. Pitch is the included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.

(7) Fastenings. A fastening is a device to attach a ladder to a structure, building, or equipment.

(8) Rungs. Rungs are ladder crosspieces of circular or oval cross-section on which a person may step in ascending or descending.

(9) Cleats. Cleats are ladder crosspieces of rectangular cross-section placed on edge on which a person may step in ascending or descending.

(10) Steps. Steps are the flat crosspieces of a ladder on which a person may step in ascending or descending.

(11) Cage. A cage is a guard that may be referred to as a cage or basket guard which is an enclosure that is fastened to the side rails of the fixed ladder or to the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

(12) Well. A well is a permanent complete enclosure around a fixed ladder, which is attached to the walls of the well. Proper clearances for a well will give the person who must climb the ladder the same protection as a cage.

(13) Ladder Safety Device. A ladder safety device is any device, other than a cage or well, designed to eliminate or reduce the possibility of accidental falls and which may incorporate such features as life belts, friction brakes, and sliding attachments.

(14) Grab Bars. Grab bars are individual handholds placed adjacent to or as an extension above ladders for the purpose of providing access beyond the limits of the ladder.

(15) Through Ladder. A through ladder is one from which a man getting off at the top must step through the ladder in order to reach the landing.

(16) Side-step Ladder. A side-step ladder is one from which a man getting off at the top must step sideways from the ladder in order to reach the landing. [Order 73-5, § 296-24-81001, filed 5/9/73 and Order 73-4, § 296-24-81001, filed 5/7/73.]

WAC 296-24-81003 Design requirements. (1) Design Considerations. All ladders, appurtenances, and fastenings shall be designed to meet the following load requirements:

(a) The minimum design live load shall be a single concentrated load of 200 pounds.

(b) The number and position of additional concentrated live-load units of 200 pounds each as determined from anticipated usage of the ladder shall be considered in the design.

(c) The live loads imposed by persons occupying the ladder shall be considered to be concentrated at such points as will cause the maximum stress in the structural member being considered.

(d) The weight of the ladder and attached appurtenances together with the live load shall be considered in the design of rails and fastenings.

(2) Design Stresses. Design stresses for wood components of ladders shall not exceed those specified in WAC 296-24-78001 through WAC 296-24-79507. All wood parts of fixed ladders shall meet the requirements of WAC 296-24-78005.

For fixed ladders consisting of wood side rails and wood rungs or cleats, used at a pitch in the range 75 degrees to 90 degrees, and intended for use by no more than one person per section, single ladders as described in WAC 296-24-78007(3)(b) are acceptable. [Order 73-5, § 296-24-81003, filed 5/9/73 and Order 73-4, § 296-24-81003, filed 5/7/73.]

WAC 296-24-81005 Specific features. (1) Rungs and Cleats. (a) All rungs shall have a minimum diameter of three-fourths inch for metal ladders, except as

covered in subsection (7)(a) of this section, and a minimum diameter of 1 1/8 inches for wood ladders.

(b) The distance between rungs, cleats, and steps shall not exceed 12 inches and shall be uniform throughout the length of the ladder.

(c) The minimum clear length of rungs or cleats shall be 16 inches.

(d) Rungs, cleats, and steps shall be free of splinters, sharp edges, burrs, or projections which may be a hazard.

(e) The rungs of an individual-rung ladder shall be so designed that the foot cannot slide off the end. (A suggested design is shown in figure D-1, at the end of this section.)

(2) Side Rails. Side rails which might be used as a climbing aid shall be of such cross sections as to afford adequate gripping surface without sharp edges, splinters, or burrs.

(3) Fastenings. Fastenings shall be an integral part of fixed ladder design.

(4) Splices. All splices made by whatever means shall meet design requirements as noted in WAC 296-24-81003(1). All splices and connections shall have smooth transition with original members and with no sharp or extensive projections.

(a) When fixed ladders are spliced the splice plates shall be the same depth as side rails.

(b) The length of the splice plates shall be four (4) times the depth of the side rail. They shall be of metal not less than one-fourth of an inch in thickness and chamfered on all exposed edges.

(c) Splice plates shall be secured by bolts or rivets with the heads countersunk or of the button type.

(d) The heads shall be on the outside of the rail.

(e) The bolts or rivets shall be not less than one-half inch nor more than five-eighths inch in diameter.

(f) The bolt ends shall be chamfered with only the chamfered end extending beyond the nut.

(g) Both ends of the rivet shall be button shape.

(h) Washers shall be placed under the nuts and rivet ends on wood side rails.

(i) There shall be a minimum of three bolts or rivets on each side of the joint for metal side rails and a minimum of four bolts or rivets for wood side rails.

(j) Bolts and rivets in both metal and wood side rails shall be staggered in position.

(5) Electrolytic Action. Adequate means shall be employed to protect dissimilar metals from electrolytic action when such metals are joined.

(6) Welding. All welding shall be in accordance with the "Code for Welding in Building Construction" (AWS D1.0-1966).

(7) Protection from Deterioration. (a) Metal ladders and appurtenances shall be painted or otherwise treated to resist corrosion and rusting when location demands. Ladders formed by individual metal rungs imbedded in concrete, which serve as access to pits and to other areas under floors, are frequently located in an atmosphere that causes corrosion and rusting. To increase rung life in such atmosphere, individual metal rungs shall have a minimum diameter of 1 inch or shall be painted or otherwise treated to resist corrosion and rusting.

(b) Wood ladders, when used under conditions where decay may occur, shall be treated with a nonirritating preservative, and the details shall be such as to prevent or minimize the accumulation of water on wood parts.

(c) When different types of materials are used in the construction of a ladder, the materials used shall be so treated as to have no deleterious effect one upon the other. [Order 73-5, § 296-24-81005, filed 5/9/73 and Order 73-4, § 296-24-81005, filed 5/7/73.]

WAC 296-24-81007 Clearance. (1) Climbing Side. On fixed ladders, the perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be 36 inches for a pitch of 76 degrees, and 30 inches for a pitch of 90 degrees (fig. D-2 of this section), with minimum clearances for intermediate pitches varying between these two limits in proportion to the slope, except as provided in (3) and (5) of this section.

(2) Ladders Without Cages or Wells. A clear width of at least 15 inches shall be provided each way from the centerline of the ladder in the climbing space, except when cages or wells are necessary.

(3) Ladders with Cages or Baskets. Ladders equipped with cage or basket are excepted from the provisions of (1) and (2) of this section, but shall conform to the provisions of WAC 296-24-81009(1)(e). Fixed ladders in smooth-walled wells are excepted from the provisions of (1) of this section, but shall conform to the provisions of WAC 296-24-81009(1)(f).

(4) Clearance in Back of Ladder. The distance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be not less than 7 inches, except that when unavoidable obstructions are encountered, minimum clearances as shown in figure D-3 shall be provided.

(5) Clearance in Back of Grab Bar. The distance from the centerline of the grab bar to the nearest permanent object in back of the grab bars shall be not less than 4 inches. Grab bars shall not protrude on the climbing side beyond the rungs of the ladder which they serve.

(6) Step-across Distance. The step-across distance from the nearest edge of ladder to the nearest edge of equipment or structure shall be not more than 12 inches, or less than 2 1/2 inches (fig. D-4).

(7) Hatch Cover. Counterweighted hatch covers shall open a minimum of 60 degrees from the horizontal. The distance from the centerline of rungs or cleats to the edge of the hatch opening on the climbing side shall be not less than 24 inches for offset wells or 30 inches for straight wells. There shall be no protruding potential hazards within 24 inches of the centerline of rungs or cleats; any such hazards within 30 inches of the centerline of the rungs or cleats shall be fitted with deflector plates placed at an angle of 60 degrees from the horizontal as indicated in figure D-5. The relationship of a fixed ladder to an acceptable counterweighted hatch cover is illustrated in figure D-6. [Order 73-5, § 296-24-81007, filed 5/9/73 and Order 73-4, § 296-24-81007, filed 5/7/73.]

WAC 296-24-81009 Special requirements. (1) Cages or Wells. (a) Cages or wells (except on chimney ladders) shall be built, as shown on the applicable drawings, covered in detail in figures D-7, D-8, and D-9, or of equivalent construction.

(b) Cages or wells (except as provided in (5) of this section) conforming to the dimensions shown in figures D-7, D-8, and D-9 shall be provided on ladders of more than 20 feet to a maximum unbroken length of 30 feet.

(c) Cages shall extend a minimum of 42 inches above the top of landing, unless other acceptable protection is provided.

(d) Cages shall extend down the ladder to a point not less than 7 feet nor more than 8 feet above the base of the ladder, with bottom flared not less than 4 inches, or portion of cage opposite ladder shall be carried to the base.

(e) Cages shall not extend less than 27 nor more than 28 inches from the centerline of the rungs of the ladder. Cage shall not be less than 27 inches in width. The inside shall be clear of projections. Vertical bars shall be located at a maximum spacing of 40 degrees around the circumference of the cage; this will give a maximum spacing of approximately 9 1/2 inches, center to center.

(f) Ladder wells shall have a clear width of at least 15 inches measured each way from the centerline of the ladder. Smooth-walled wells shall be a minimum of 27 inches from the centerline of rungs to the well wall on the climbing side of the ladder. Where other obstructions on the climbing side of the ladder exist, there shall be a minimum of 30 inches from the centerline of the rungs.

(2) Landing Platforms. When ladders are used to ascend to heights exceeding 20 feet (except on chimneys), landing platforms shall be provided for each 30 feet of height or fraction thereof, except that, where no cage, well, or ladder safety device is provided, landing platforms shall be provided for each 20 feet of height or fraction thereof. Each ladder section shall be offset from adjacent sections. Where installation conditions (even for a short, unbroken length) require that adjacent sections be offset, landing platforms shall be provided at each offset.

(a) Where a man has to step a distance greater than 12 inches from the centerline of the rung of a ladder to the nearest edge of structure or equipment, a landing platform shall be provided. The minimum step-across distance shall be 2 1/2 inches.

(b) All landing platforms shall be equipped with standard railings and toeboards, so arranged as to give safe access to the ladder. Platforms shall be not less than 24 inches in width and 30 inches in length.

(c) One rung of any section of ladder shall be located at the level of the landing laterally served by the ladder. Where access to the landing is through the ladder, the same rung spacing as used on the ladder shall be used from the landing platform to the first rung below the landing.

(3) Ladder Extensions. The side rails of through or side-step ladder extensions shall extend 3 1/2 feet above parapets and landings. For through ladder extensions, the rungs shall be omitted from the extension and shall

have not less than 18 nor more than 24 inches clearance between rails. For side-step or offset fixed ladder sections, at landings, the side rails and rungs shall be carried to the next regular rung beyond or above the 3 1/2 feet minimum (fig D-10).

(4) Grab Bars. Grab bars shall be spaced by a continuation of the rung spacing when they are located in the horizontal position. Vertical grab bars shall have the same spacing as the ladder side rails. Grab-bar diameters shall be the equivalent of the round-rung diameters.

(5) Ladder Safety Devices. Ladder safety devices may be used on tower, water tank, and chimney ladders over 20 feet in unbroken length in lieu of cage protection. No landing platform is required in these cases. All ladder safety devices such as those that incorporate lifelines, friction brakes, and sliding attachments shall meet the design requirements of the ladders which they serve. [Order 73-5, § 296-24-81009, filed 5/9/73 and Order 73-4, § 296-24-81009, filed 5/7/73.]

WAC 296-24-81011 Pitch. Preferred Pitch. The preferred pitch of fixed ladders shall be considered to come in the range of 75 degrees and 90 degrees with the horizontal (fig. D-11).

(2) Substandard Pitch. Fixed ladders shall be considered as substandard if they are installed within the substandard pitch range of 60 and 75 degrees with the horizontal. Substandard fixed ladders are permitted only where it is found necessary to meet conditions of installation. This substandard pitch range shall be considered as a critical range to be avoided, if possible.

(3) Scope of Coverage in this Section. This section covers only fixed ladders within the pitch range of 60 degrees and 90 degrees with the horizontal.

(4) Pitch Greater than 90 Degrees. Ladders having a pitch in excess of 90 degrees with the horizontal are prohibited. [Order 73-5, § 296-24-81011, filed 5/9/73 and Order 73-4, § 296-24-81011, filed 5/7/73.]

WAC 296-24-81013 Maintenance and use. (1) All ladders shall be maintained in a safe condition. All ladders shall be inspected regularly, with the intervals between inspections being determined by use and exposure.

NOTE: For illustrations, see Figs. D-1 through D-11.

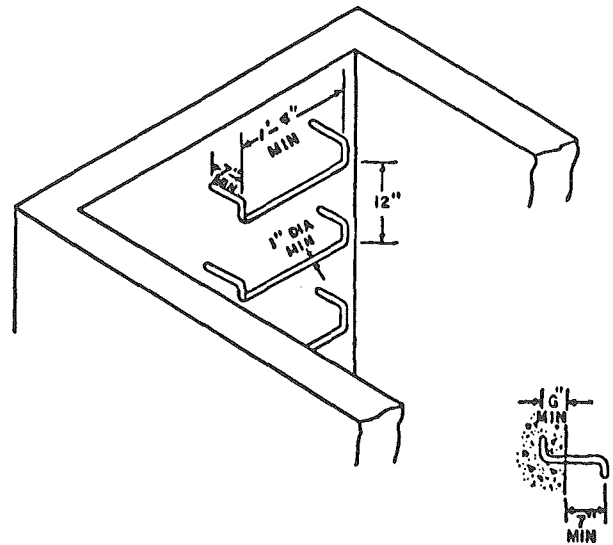
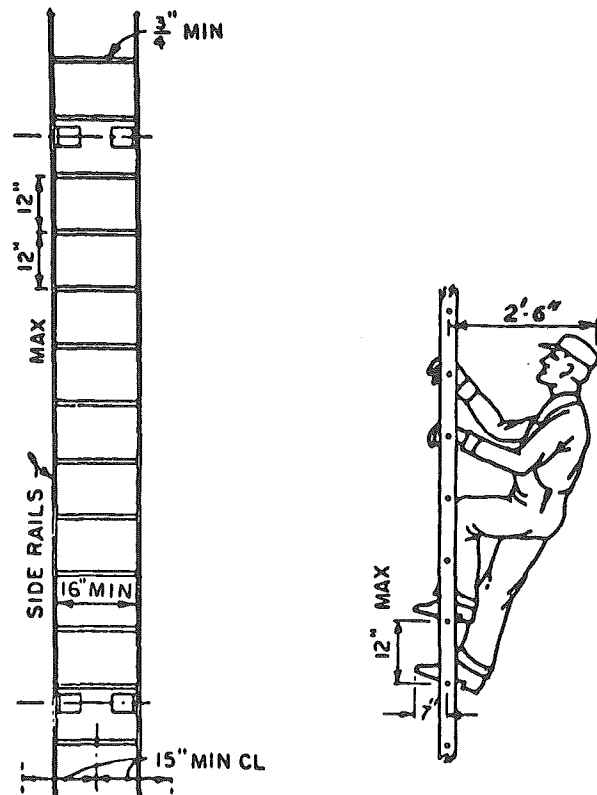


Figure D-1

Suggested design for rungs on individual-rung ladders.



RAIL LADDER WITH BAR STEEL RAILS AND ROUND STEEL RUNGS

Figure D-2

Minimum Ladder Clearances

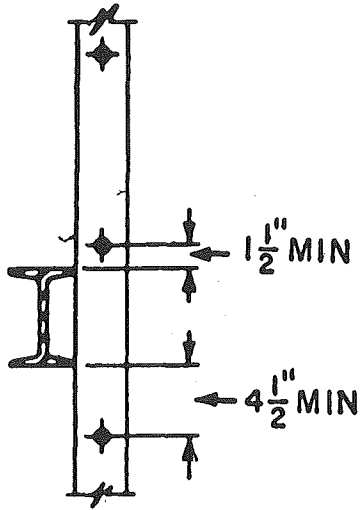


Figure D-3

Clearance for Unavoidable Obstruction at Rear of Fixed Ladder

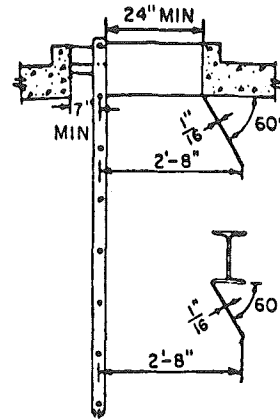


Figure D-5

Deflector Plates for Head Hazards

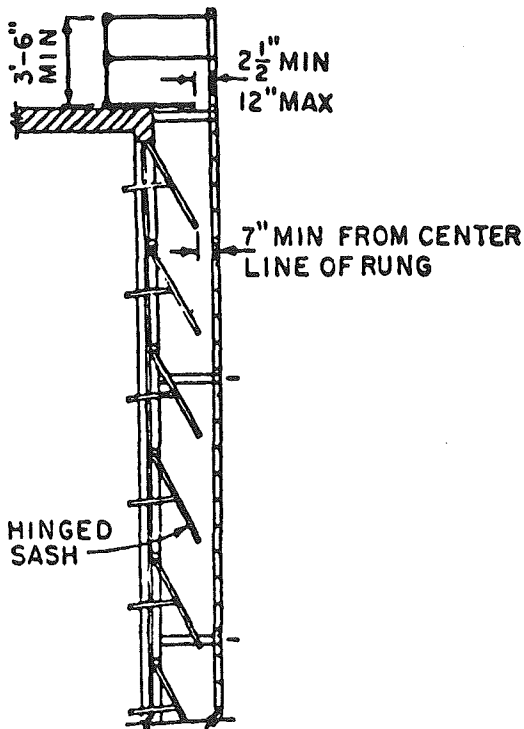
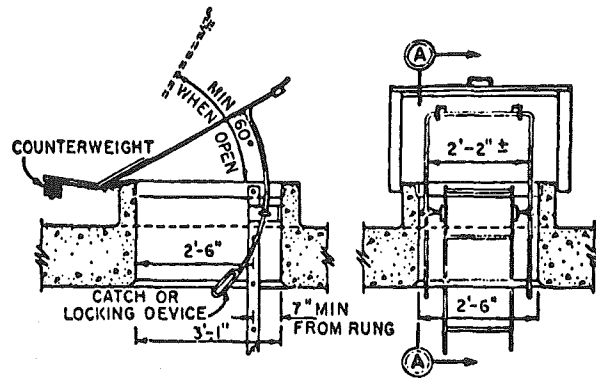


Figure D-4

Ladder Far from Wall



SECTION A-A

SECTIONAL ELEVATION

Figure D-6

Relationship of Fixed Ladder to a Safe Access Hatch

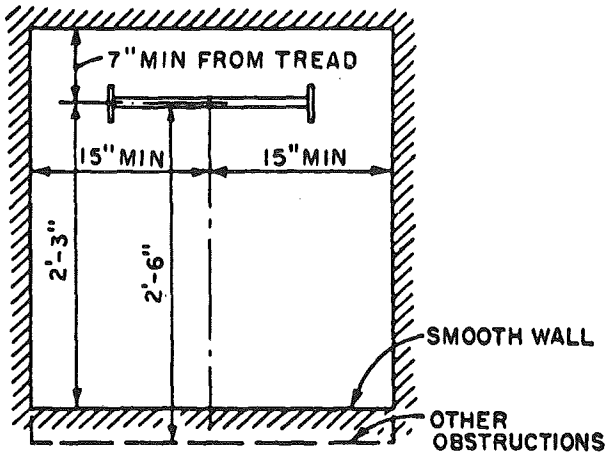


Figure D-7

Clearance Diagram for Fixed Ladder in Well

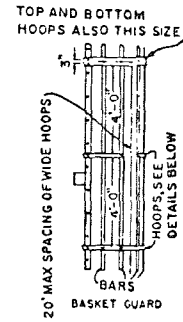
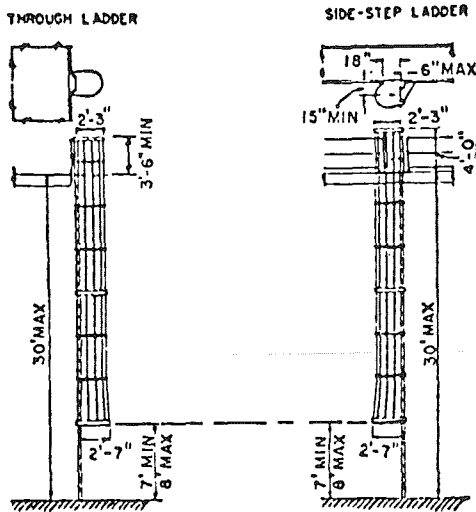


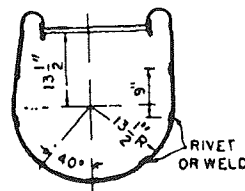
Figure D-8 (part)



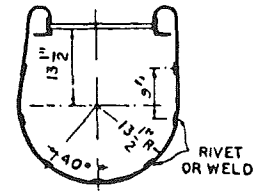
ACCESS TO LANDING
PLATFORM THROUGH
LADDER

ACCESS Laterally
FROM LADDER

Figure D-8 (part)



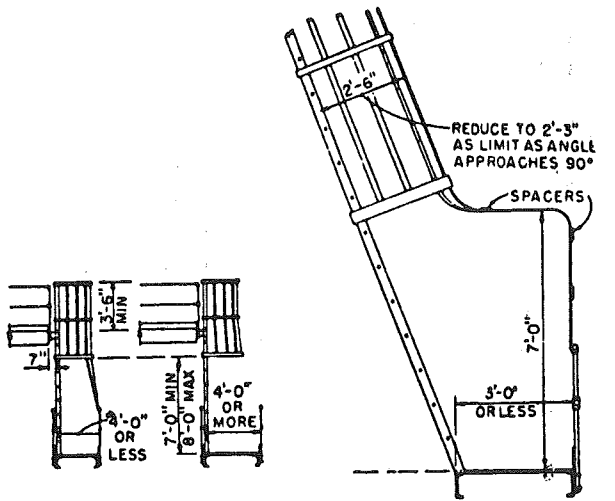
BASKET GUARD HOOP
BAR LADDER



BASKET GUARD HOOP
ANGLE IRON LADDER

Figure D-8 (Part)

Cages for ladders More Than 20 Feet High



SHORT LADDERS AT ELEVATED LOCATIONS

INCLINED LADDER AT ELEVATED LOCATION (For Special Hazard Only)

Figure D-9.

Cages—Special applications.

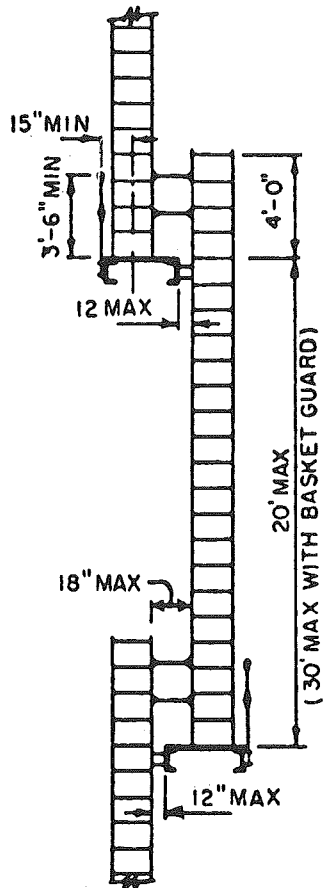


Figure D-10

Offset Fixed Ladder Sections

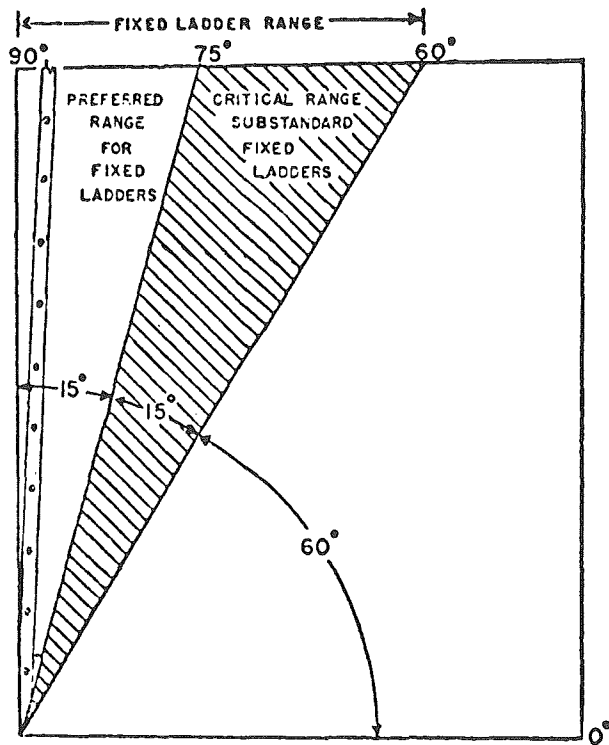


Figure D-11

Pitch of Fixed Ladders

(2) When ascending or descending, the climber must face the ladder.

(3) Workmen shall not ascend or descend ladders while carrying tools or materials which will interfere with the free use of both hands. [Order 76-6, § 296-24-81013, filed 3/1/76; Order 73-5, § 296-24-81013, filed 5/9/73 and Order 73-4, § 296-24-81013, filed 5/7/73.]

WAC 296-24-825 Safety requirements for scaffolding. [Order 73-5, § 296-24-825, filed 5/9/73 and Order 73-4, § 296-24-825, filed 5/7/73.]

WAC 296-24-82501 Definitions. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-82503 through WAC 296-24-82545 unless the context requires otherwise. (1) Bearer. A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(2) Boatswain's Chair. A seat supported by slings attached to a suspended rope, designed to accommodate one workman in a sitting position.

(3) Brace. A tie that holds one scaffold member in a fixed position with respect to another member.

(4) Bricklayer's Square Scaffold. A scaffold composed of framed wood squares which support a platform limited to light and medium duty.

(5) Carpenters' Bracket Scaffold. A scaffold consisting of wood or metal brackets supporting a platform.

(6) Coupler. 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 drop-forged steel, malleable iron, or structural grade aluminum. The use of gray cast iron is prohibited.

(7) Crawling Board or Chicken Ladder. A plank with cleats spaced and secured at equal intervals, for use by a worker on roofs, not designed to carry any material.

(8) Double Pole or Independent Pole Scaffold. 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.

(9) Float or ship Scaffold. 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.

(10) Guardrail. A rail secured to uprights and erected along the exposed sides and ends of platforms.

(11) Heavy Duty Scaffold. A scaffold designed and constructed to carry a working load not to exceed 75 pounds per square foot.

(12) Horse Scaffold. A scaffold for light or medium duty, composed of horses supporting a work platform.

(13) Interior Hung Scaffold. A scaffold suspended from the ceiling or roof structure.

(14) Ladder Jack Scaffold. A light duty scaffold supported by brackets attached to ladders.

(15) Ledger (Stringer). A horizontal scaffold member which extends from post to post and which supports the putlogs or bearer forming a tie between the posts.

(16) Light Duty Scaffold. A scaffold designed and constructed to carry a working load not to exceed 25 pounds per square foot.

(17) Manually Propelled Mobile Scaffold. A portable rolling scaffold supported by casters.

(18) Mason's Adjustable Multiple-point Suspension Scaffold. 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.

(19) Maximum Intended Load. The total of all loads including the working load, the weight of the scaffold, and such other loads as may be reasonably anticipated.

(20) Medium Duty Scaffold. A scaffold designed and constructed to carry a working load not to exceed 50 pounds per square foot.

(21) Mid-rail. A rail approximately midway between the guardrail and platform, used when required, and secured to the uprights erected along the exposed sides and ends of platforms.

(22) Needle Beam Scaffold. A light duty scaffold consisting of needle beams supporting a platform.

(23) Outrigger Scaffold. 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 of such a building or structure.

(24) Putlog. A scaffold member upon which the platform rests.

(25) Roofing Bracket. A bracket used in sloped roof construction, having provisions for fastening to the roof

or supported by ropes fastened over the ridge and secured to some suitable object.

(26) Runner. The lengthwise horizontal bracing or bearing members or both.

(27) Scaffold. Any temporary elevated platform and its supporting structure used for supporting workmen or materials or both.

(28) Single-point Adjustable Suspension Scaffold. 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.

(29) Single Pole Scaffold. Platforms resting on putlogs or crossbeams, the outside ends of which are supported on ledgers secured to a single row of posts or uprights and the inner ends of which are supported on or in a wall.

(30) Stone Setters' Adjustable Multiple-point Suspension Scaffold. 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.

(31) Toeboard. A barrier secured along the sides and ends of a platform, to guard against the falling of material.

(32) Tube and Coupler Scaffold. 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.

(33) Tubular Welded Frame Scaffold. A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections which consist of posts and horizontal bearer with intermediate members. Panels or frames shall be braced with diagonal or cross braces.

(34) Two-point Suspension Scaffold (Swinging Scaffold). 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.

(35) Window Jack Scaffold. A scaffold, the platform of which is supported by a bracket or jack which projects through a window opening.

(36) Working Load. Load imposed by men, materials, and equipment. [Order 73-5, § 296-24-82501, filed 5/9/73 and Order 73-4, § 296-24-82501, filed 5/7/73.]

WAC 296-24-82503 General requirements for all scaffolds. (1) 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 296-24-780 through WAC 296-24-78009 and WAC 296-24-795 through WAC 296-24-79507.

(2) 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.

(3) Guardrails and toeboards shall be installed on all open sides and ends of platforms more than 8 feet above the ground or floor except:

(a) Scaffolding wholly within the interior of a building and covering the entire floor area of any room therein and not having any side exposed to a hoistway, elevator shaft, stairwell, or other floor openings, and

(b) Needle-beam scaffolds and floats in use by structural iron workers.

Guardrails should all be 2 x 4 inches or the equivalent, installed no less than 36 inches or not more than 42 inches high, with a midrail, when required, of 1- x 4-inch nominal lumber or equivalent. Supports should be at intervals not to exceed ten feet. Toeboards shall be a minimum of 4 inches nominal lumber in height.

(4) Scaffolds and their components shall be capable of supporting without failure at least four times the maximum intended load.

(5) Scaffolds and other devices mentioned or described in these standards shall be maintained in safe condition. Scaffolds shall not be altered or moved horizontally while they are in use or occupied.

(6) Any scaffold damaged or weakened from any cause shall be immediately repaired and shall not be used until repairs have been completed.

(7) Scaffolds shall not be loaded in excess of the working load for which they are intended.

(8) All load-carrying timber members of scaffold framing shall be a minimum of 1,500 f. (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. (NOTE: Where nominal sizes of lumber are used in place of rough sizes the nominal size lumber shall be such as to provide equivalent strength to that specified in tables D-7 through D-12 and D-16.)

(9) All planking shall be Scaffold Grade as recognized by grading rules for the species of wood used. The maximum permissible spans for 2- x 9-inch or wider planks are shown in the following table:

	Material				
	Full thickness undressed lumber		Nominal thickness lumber		
Working load (p.s.f.)	25	50	75	25	50
Permissible span (ft.)	10		8	6	8
				8	6

The maximum permissible span for 1 1/4 x 9-inch or wider plank of full thickness is 4 feet with medium loading of 50 p.s.f.

(10) Nails or bolts used in the construction of scaffolds shall be of adequate size and in sufficient numbers at each connection to develop the designed strength of

the scaffold. Nails shall not be subjected to a straight pull and shall be driven full length.

(11) All planking or platforms shall be overlapped (minimum 12 inches) or secured from movement.

(12) An access ladder or equivalent safe access shall be provided.

(13) Scaffold planks shall extend over their end supports not less than 6 inches nor more than 18 inches.

(14) The poles, legs, or uprights of scaffolds shall be plumb, and securely and rigidly braced to prevent swaying and displacement.

TABLE D-7

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS LIGHT DUTY

	Maximum height of scaffold	
	20 feet	60 feet
Uniformly distributed load	Not to exceed 25 pounds per square foot.	
Poles or uprights	2 by 4 in.	4 by 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 by 4 in.	2 by 4 in.
Bearers or putlogs to 5 ft. 0 in. width	2 by 6 in. or 3 by 4 in.	2 by 6 in. or 3 by 4 in. (rough).
Ledgers	1 by 4 in.	1 1/4 by 9 in.
Planking	1 1/4 by 9 in. (rough)	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high (minimum)	4 in. high (minimum)
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

TABLE D-8

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 4 in.
Spacing of bearers or putlogs	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	9 ft. 0 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum)
Guardrail	2 by 4 in.

All members except planking are used on edge.

TABLE D-9

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS HEAVY DUTY

Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Maximum width of scaffold	5 ft. 0 in.
Bearers or putlogs	2 by 9 in. or 3 by 5 in. (rough).
Spacing of bearers or putlogs	6 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 6 in.
Bracing, horizontal and diagonal	2 by 4 in.

TABLE D-9

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF SINGLE POLE SCAFFOLDS HEAVY DUTY

Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum).
Guardrail	2 by 4 in.

All members except planking are used on edge.

TABLE D-10

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS LIGHT DUTY

	Maximum height of scaffold	
	20 feet	60 feet

Uniformly distributed load	Not to exceed 25 pounds per square foot.	
Poles or uprights	2 by 4 in.	4 by 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 by 4 in.	1 1/4 by 9 in.
Bearers to 3 ft. 0 in. span	2 by 4 in.	2 by 4 in.
Bearers to 10 ft. 0 in. span	2 by 6 in. or 3 by 4 in.	2 by 9 (rough) or 3 by 8 in.
Planking	1 1/4 by 9 in.	2 by 9 in.
Vertical spacing of horizontal members	7 ft. 0 in.	7 ft. 0 in.
Bracing, horizontal and diagonal	1 by 4 in.	1 by 4 in.
Tie-ins	1 by 4 in.	1 by 4 in.
Toeboards	4 in. high	4 in. high (minimum).
Guardrail	2 by 4 in.	2 by 4 in.

All members except planking are used on edge.

TABLE D-11

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS MEDIUM DUTY

Uniformly distributed load	Not to exceed 50 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	8 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	6 ft. 0 in.
Spacing of bearers	8 ft. 0 in.
Bearers	2 by 9 in. rough or 2 by 10 in.
Bracing, horizontal	1 by 6 in. or 1 1/4 by 4 in.
Bracing, diagonal	1 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.
Toeboards	4 in. high (minimum).
Guardrail	2 by 4 in.

All members except planking are used on edge.

TABLE D-12

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS HEAVY DUTY

Uniformly distributed load	Not to exceed 75 pounds per square foot.
Maximum height of scaffold	60 ft.
Poles or uprights	4 by 4 in.
Pole spacing (longitudinal)	6 ft. 0 in.
Pole spacing (transverse)	8 ft. 0 in.
Ledgers	2 by 9 in.
Vertical spacing of horizontal members	4 ft. 6 in.
Bearers	2 by 9 in. (rough).
Bracing, horizontal and diagonal	2 by 4 in.
Tie-ins	1 by 4 in.
Planking	2 by 9 in.

TABLE D-12

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF INDEPENDENT POLE SCAFFOLDS HEAVY DUTY

Toeboards _____	4 in. high (minimum).
Guardrail _____	2 by 4 in.

All members except planking are used on edge.

(15) Materials being hoisted onto a scaffold shall have a tag line.

(16) Overhead protection shall be provided for workmen working on a scaffold when they are exposed to overhead hazards.

(17) Scaffolds shall be provided with a screen between the toe board and the guardrail, extending along the entire opening, consisting of No. 18 gauge U.S. Standard Wire one-half-inch mesh or the equivalent, where persons are required to work or pass under the scaffolds.

(18) Employees shall not work on scaffolds during storms or high winds.

(19) Employees shall not work on scaffolds which are covered with ice or snow.

(20) Tools, materials, and debris shall not be allowed to accumulate in quantities to cause a hazard.

(21) Only treated or protected fiber rope shall be used for or near any work involving the use of corrosive substances or chemicals.

(22) Wire or fiber rope used for scaffold suspension shall be capable of supporting at least six times the intended load.

(23) When acid solutions are used for cleaning buildings over 50 feet in height, wire rope supported scaffolds shall be used.

(24) The use of shore scaffolds or leanto scaffolds is prohibited.

(25) Lumber sizes, when used in WAC 296-24-82505 through WAC 296-24-82545, refer to nominal sizes except where otherwise stated.

(26) Scaffolds shall be secured to permanent structures, through use of anchor bolts, reveal bolts, or other equivalent means. Window cleaners' anchor bolts shall not be used.

(27) Special precautions shall be taken to protect scaffold members, including any wire or fiber ropes, when using a heat-producing process.

(28) When rope falls are used to support swinging scaffolding, the rope falls shall be of sufficient length to reach the ground. Lengthening rope falls by typing on additional lengths shall be prohibited.

(29) When screw shackles are used to support staging, etc., the pin must be wired or pinned so that the shackle will not become unscrewed by strain or stress.

(30) All hooks on blocks used for raising scaffolding shall be provided with a safety latch or be "moused at the throat" to prevent the hook from becoming dislodged.

(31) Lifelines size shall be 3/4 inch manila rope or equivalent with a minimum breaking strength of 5400 pounds. Safety belt lanyards 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. This rope shall have a minimum breaking strength of 5400 pounds. [Order 74-27, § 296-24-82503, filed 5/7/74; Order 73-5, § 296-24-82503, filed 5/9/73 and Order 73-4, § 296-24-82503, filed 5/7/73.]

WAC 296-24-82505 General requirements for wood pole scaffolds. (1) Scaffold poles shall bear on a foundation of sufficient size and strength to spread the load from the poles over a sufficient area to prevent settlement. All poles shall be set plumb.

(2) 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 not be less than 4 feet 0 inches 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 of other materials of equivalent strength may be used.

(3) Independent pole scaffolds shall be set as near to the wall of the building as practicable.

(4) 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.

(5) Putlogs or bearers shall be set with their greater dimensions vertical, long enough to project over the ledgers of the inner and outer rows of poles at least 3 inches for proper support.

(6) 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.

(7) 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.

(8) Diagonal bracing shall be provided to prevent the poles from moving in a direction parallel with the wall of the building, or from buckling.

(9) 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.

(10) Full diagonal face bracing shall be erected across the entire face of pole scaffolds in both directions. The braces shall be spliced at the poles.

(11) 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.

(12) 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

dislodgement of planks due to deflection, and the ends shall be nailed or cleated to prevent their dislodgement.

(13) When a scaffold turns a corner, 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 right angles shall be laid so as to extend over and rest on the first layer of planking.

(14) 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.

(15) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 x 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(16) All wood pole scaffolds 60 feet or less in height shall be constructed and erected in accordance with tables D-7 through D-12. If they are over 60 feet in height they shall be designed by a registered professional engineer and constructed and erected in accordance with such design. A copy of the typical drawings and specifications shall be made available to the employer and for inspection purposes.

(17) Wood-pole scaffolds shall not be erected beyond the reach of effective firefighting apparatus. [Order 73-5, § 296-24-82505, filed 5/9/73 and Order 73-4, § 296-24-82505, filed 5/7/73.]

WAC 296-24-82507 Tube and coupler scaffolds. (1) 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.

(2) 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.

(3) 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 apart by 6 feet 6 inches along the length of the scaffold. Other structural metals when used must be designed to carry an equivalent load.

(4) Tube and coupler scaffolds shall be limited in heights and working levels to those permitted in tables

D-13, 14, and 15. Drawings and specifications of all tube and coupler scaffolds above the limitations in tables D-13, 14, and 15 shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

(5) All tube and coupler scaffolds shall be constructed and erected to support four times the maximum intended loads as set forth in tables D-13, 14, and 15, or as set forth in the specifications by a registered professional engineer, copies which shall be made available to the employer and for inspection purposes.

(6) All tube and coupler scaffolds shall be erected by competent and experienced personnel.

(7) Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.

(8) 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 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.

(9) Bearers shall be installed transversely between posts and shall be securely coupled to the posts bearing on the runner coupler. When coupled directly to the runners, the coupler must be kept as close to the posts as possible.

(10) Bearers shall be at least 4 inches but not more than 12 inches longer than the post spacing or runner spacing. Bearers may be cantilevered for use as brackets to carry not more than two planks.

(11) Cross bracing shall be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing shall extend diagonally from the inner and outer runners upward to the next outer and inner runners.

(12) Longitudinal diagonal bracing shall be installed at approximately a 45-degree angle from near the base of the first outer post upward to the extreme top of the scaffold. Where the longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

(13) 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.

(14) Guardrails not less than 2 x 4 inches nominal lumber or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 x 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17). (See tables D-13, 14 and 15.

TABLE D-13
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	0	91 ft. 0 in.

TABLE D-14
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.

TABLE D-15
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 (transverse)	6 ft. 0 in.	
Working levels	Additional planked levels	Maximum height
1	6	125 ft.

[Order 73-5, § 296-24-82507, filed 5/9/73 and Order 73-4, § 296-24-82507, filed 5/7/73.]

WAC 296-24-82509 Tubular welded frame scaffolds. (1) Metal tubular frame scaffolds, including accessories such as braces, brackets, trusses, screw legs,

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ladders, etc., shall be designed and proved to safely support four times the maximum intended load.

(2) Spacing of panels or frames shall be consistent with the loads imposed.

(3) 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 align vertical members so that the erected scaffold is always plumb, square, and rigid. All brace connections shall be made secure.

(4) Scaffold legs shall be set on adjustable bases or plain bases placed on mud sills or other foundations adequate to support the maximum intended load.

(5) The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

(6) Where uplift may occur, panels shall be locked together vertically by pins or other equivalent suitable means.

(7) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1-x 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(8) All tubular metal scaffolds shall be constructed and erected to support four times the maximum intended loads.

(9) 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.

(10) Maximum permissible spans of planking shall be in conformity with WAC 296-24-82503(9).

(11) Drawings and specifications for all frame scaffolds over 125 feet in height above the base plates shall be designed by a registered professional engineer and copies made available to the employer and for inspection purposes.

(12) All tubular welded frame scaffolds shall be erected by competent and experienced personnel.

(13) Frames and accessories for scaffolds shall be maintained in good repair and every defect, unsafe condition, or noncompliance with this section shall be immediately corrected before further use of the scaffold. Any broken, bent, excessively rusted, altered, or otherwise structurally damaged frames or accessories shall not be used.

(14) Periodic inspections shall be made of all welded frames and accessories, and any maintenance, including painting, or minor corrections authorized by the manufacturer, shall be made before further use. [Order 73-5, § 296-24-82509, filed 5/9/73 and Order 73-4, § 296-24-82509, filed 5/7/73.]

WAC 296-24-82511 Outrigger scaffolds. (1) Outrigger beams shall extend not more than 6 feet beyond

the face of the building. The inboard end of the outrigger beams, measured from the fulcrum point to the extreme point of support, shall be not less than one and one-half 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.

(2) The inboard ends of outrigger beams shall be securely supported 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. 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.

(3) Unless outrigger scaffolds are designed by a licensed professional engineer, they shall be constructed and erected in accordance with table D-16. Outrigger scaffolds designed by a registered professional engineer shall be constructed and erected in accordance with such design. A copy of the detailed drawings and specifications showing the sizes and spacing of members shall be kept on the job.

(4) Planking shall be laid tight and shall extend to within 3 inches of the building wall. Planking shall be nailed or bolted to outriggers.

(5) Where there is danger of material falling from the scaffold, a wire mesh or other enclosure shall be provided between the guardrail and the toeboard.

(6) Where additional working levels are required to be supported by the outrigger method, the plans and specifications of the outrigger and scaffolding structure shall be designed by a registered professional engineer to comply with requirements of this section.

TABLE D-16

MINIMUM NOMINAL SIZE AND MAXIMUM SPACING OF MEMBERS OF OUTRIGGER SCAFFOLDS

	Light duty	Medium duty
Maximum scaffold load	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 9 in.	2 x 9 in.
Guardrail	2 x 4 in.	2 x 4 in.
Guardrail uprights	2 x 4 in.	2 x 4 in.
Toeboards	4 in. (minimum).	4 in. (minimum).

[Order 73-5, § 296-24-82511, filed 5/9/73 and Order 73-4, § 296-24-82511, filed 5/7/73.]

WAC 296-24-82513 Masons' adjustable multiple-point suspension scaffolds. (1) 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.

(2) The scaffold shall be provided with hoisting machines that meet the requirements of Underwriters' Laboratories or Factory Mutual Engineering Corp.

(3) The platform shall be supported by wire ropes in conformity with WAC 296-24-82503(22), suspended from overhead outrigger beams.

(4) The scaffold outrigger beams shall consist of structural metal securely fastened or anchored to the frame or floor system of the building or structure.

(5) Each outrigger beam shall be equivalent in strength to at least a standard 7-inch, 15.3-pound steel I-beam, be at least 15 feet long, and shall not project more than 6 feet 6 inches beyond the bearing point.

(6) Where the overhang exceeds 6 feet 6 inches, outrigger beams shall be composed of stronger beams or multiple beams and be installed in accordance with approved designs and instructions.

(7) If channel iron outrigger beams are used in place of I-beams, they shall be securely fastened together with the flanges turned out.

(8) All outrigger beams shall be set and maintained with their webs in a vertical position.

(9) A stop bolt shall be placed at each end of every outrigger beam.

(10) The outrigger beam shall rest on suitable wood-bearing blocks.

(11) All parts of the scaffold such as bolts, nuts, fittings, clamps, wire rope, and outrigger beams and their fastenings, shall be maintained in sound and good working condition and shall be inspected before each installation and periodically thereafter.

(12) The free end of the suspension wire ropes shall be equipped with proper size thimbles and be secured by splicing or other equivalent means. The running ends shall be securely attached to the hoisting drum and at least four turns of rope shall at all times remain on the drum.

(13) 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.

(14) The scaffold platform shall be equivalent in strength to at least 2-inch planking. (For maximum planking spans see WAC 296-24-82503(22).)

(15) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1 x 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(16) 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, when men are at work on the scaffold and an overhead hazard exists.

(17) Each scaffold shall be installed or relocated in accordance with designs and instructions, of a registered

professional engineer, and supervised by a competent, designated person to comply with the requirements of this section. [Order 73-5, § 296-24-82513, filed 5/9/73 and Order 73-4, § 296-24-82513, filed 5/7/73.]

WAC 296-24-82515 Two-point suspension scaffolds (swinging scaffolds). (1) 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.

(2) 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 four times the maximum intended load, and shall be designed with a support for guardrail, intermediate rail, and toeboard.

(3) When hoisting machines are used on two-point suspension scaffolds, such machines shall be of a design tested and approved by Underwriters' Laboratories or Factory Mutual Engineering Corp.

(4) The roof irons or hooks shall be of wrought iron, mild steel, or other equivalent material of proper size and design, securely installed and anchored. Tiebacks of three-fourth inch manila rope or the equivalent shall serve as a secondary means or anchorage, installed at right angles to the face of the building whenever possible and secured to a structurally sound portion of the building.

(5) Guardrails not less than 2 x 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- x 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(6) Two-point suspension scaffolds shall be suspended by wire or fiber ropes. Wire and fiber ropes shall conform to WAC 296-24-82503(22).

(7) The blocks for fiber ropes shall be of standard 6-inch size, consisting of at least one double and one single block. The sheaves of all blocks shall fit the size of rope used.

(8) All wire ropes, fiber 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.

(9) On suspension scaffolds designed for a working load of 500 pounds no more than two men shall be permitted to work at one time. On suspension scaffolds with a working load of 750 pounds, no more than three men shall be permitted to work at one time. Each workman shall be protected by a safety lifeline attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall.

(10) Where acid solutions are used, fiber ropes are not permitted unless acid-proof.

(11) Two-point suspension scaffolds shall be securely lashed to the building or structure to prevent them from swaying. Window cleaners' anchors shall not be used for this purpose.

(12) The platform of every two-point suspension scaffold shall be one of the following types:

(a) The side stringer of ladder-type platforms shall be 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 seven-eighth inch tenons mortised into the side stringers at least seven-eighth 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-eighth inch apart except at the side rails where the space may be 1 inch. Ladder-type platforms shall be constructed in accordance with table D-17.

(b) Plank-type platforms shall be composed of not less than nominal 2- x 8-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 18 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 10 feet.

(c) 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- and 6-inch crossbeams, 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. Floorboards shall not be spaced more than one-half inch apart. (See table D-17.) [Order 73-5, § 296-24-82515, filed 5/9/73 and Order 73-4, § 296-24-82515, filed 5/7/73.]

WAC 296-24-82517 Stone setters' adjustable multiple-point suspension scaffolds. (1) 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.

(2) The hoisting machine and its supports shall be of a type tested and listed by Underwriters' Laboratories or Factory Mutual Engineering Corp.

(3) The platform shall be securely fastened to the hangers by U-bolts or other equivalent means.

(4) The scaffold unit shall be suspended from metal outriggers, iron brackets, wire rope slings, or iron hooks which will safely support the maximum intended load.

(5) 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.

(6) The scaffold shall be supported by wire rope conforming with WAC 296-24-82503(22), suspended from overhead supports.

(7) 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 rope shall remain on the drum at all times.

(8) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(9) 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 butting closely.

(10) Each scaffold shall be installed or relocated in accordance with designs and instructions of a registered professional engineer, and such installation or relocation shall be supervised by a competent designated person to comply with requirements of this section. [Order 73-5, § 296-24-82517, filed 5/9/73 and Order 73-4, § 296-24-82517, filed 5/7/73.]

WAC 296-24-82519 Single-point adjustable suspension scaffolds. (1) The scaffolding, including power units or manually operated winches, shall be of a type tested and listed by Underwriters' Laboratories or Factory Mutual Engineering Corp.

(2) The power units may be either electrically or air motor driven.

(3) All power-operated gears and brakes shall be enclosed.

(4) In addition to the normal operating brake, all-power driven units must have an emergency brake which engages automatically when the normal speed of descent is exceeded.

(5) Guards, mid-rails, and toeboards shall completely enclose the cage or basket. Guardrails shall be no less than 2 by 4 inches nominal lumber or the equivalent installed no less than 36 inches nor more than 42 inches above the platform. Mid-rails shall be 1 by 6 inches nominal lumber or the equivalent, installed equidistant between the guardrail and the platform. Toeboards shall be a minimum of 4 inches nominal lumber in height.

(6) The hoisting machines, cables, and equipment shall be regularly serviced and inspected after each installation and every 30 days thereafter.

(7) The units may be combined to form a two-point suspension scaffold. Such scaffold shall comply with WAC 296-24-82515.

(8) The supporting cable shall be straight for its entire length, and the operator shall not sway the basket and fix the cable to any intermediate points to change his original path of travel.

(9) Equipment shall be maintained and used in accordance with the manufacturers' instructions.

(10) Suspension methods shall conform to applicable provisions of WAC 296-24-82515 and WAC 296-24-

82517. [Order 73-5, § 296-24-82519, filed 5/9/73 and Order 73-4, § 296-24-82519, filed 5/7/73.]

WAC 296-24-82521 Boatswain's chairs. (1) The chair seat shall be not less than 12 by 24 inches, and of 1-inch thickness. The seat shall be reinforced on the underside to prevent the board from splitting.

(2) 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.

TABLE D-17

SCHEDULE FOR LADDER-TYPE PLATFORMS

	Length of platform (feet)				
	12	14&16	18&20	22&24	28&30
Side Stringers, minimum cross section (finished sizes):					
At ends (in.)	1 3/4 x2 3/4	1 3/4 x2 3/4	1 3/4 x3	1 3/4 x3	1 3/4 x3 1/2
At middle (in.)	1 3/4 x3 3/4	1 3/4 x3 3/4	1 3/4 x4	1 3/4 x4 1/4	1 3/4 x5
Reinforcing strip (minimum)	A 1/8x7/8-in. steel reinforcing strip or its equivalent shall be attached to the side or underside, full length.				
Rungs	Rungs shall be 1 1/8-in. minimum diameter with at least 7/8-in. diameter tenons, and the maximum spacing shall be 12 in. center to center.				
Tie rods:					
Number (minimum)	3	4	4	5	6
Diameter (minimum)	1/4 in.	1/4 in.	1/4 in.	1/4 in.	1/4 in.
Flooring, minimum finished size (in.)	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4	1/2 x2 3/4

(3) Seat slings shall be of at least 3/8-inch wire rope when a workman is conducting a heat producing process such as gas or arc welding.

(4) The workman shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the worker in case of a fall.

(5) The tackle shall consist of correct size ball bearing or bushed blocks and properly spliced 5/8-inch diameter first-grade manila rope.

(6) 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 to a chimney. [Order 73-5, § 296-24-82521, filed 5/9/73 and Order 73-4, § 296-24-82521, filed 5/7/73.]

WAC 296-24-82523 Carpenters' bracket scaffolds. (1) The brackets shall consist of a triangular wood frame not less than 2 by 3 inches in cross section, or of

metal of equivalent strength. Each member shall be properly fitted and securely joined.

(2) Each bracket shall be attached to the structure by means of one of the following:

(a) A bolt no less than five-eighths inch in diameter which shall extend through the inside of the building wall.

(b) A metal stud attachment device.

(c) Welding to steel tanks.

(d) Hooking over or securing through a well-secured and adequately strong supporting member.

The brackets shall be spaced no more than 10 feet apart.

(3) No more than two persons shall occupy any given 10 feet of a bracket scaffold at any one time. Tools and materials shall not exceed 75 pounds in addition to the occupancy.

(4) The platform shall consist of not less than two 2- by 10-inch nominal size planks extending not more than 10 inches or less than 6 inches beyond each end support.

(5) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17). [Order 76-6, § 296-24-82523, filed 3/1/76; Order 73-5, § 296-24-82523, filed 5/9/73 and Order 73-4, § 296-24-82523, filed 5/7/73.]

WAC 296-24-82525 Bricklayers' square scaffolds.

(1) The squares shall not exceed 5 feet in width and 5 feet in height.

(2) Members shall be not less than those specified in Table D-18.

(3) The squares shall be reinforced on both sides of each corner with 1- by 6-inch gusset pieces. They shall also have braces 1 by 8 inches on both sides running from center to center of each member, or other means to secure equivalent strength and rigidity.

(4) 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.

TABLE D-18

MINIMUM DIMENSIONS FOR BRICKLAYERS' SQUARE SCAFFOLD MEMBERS

Members:	Dimensions (inches)
Bearers or horizontal members _____	2 by 6
Legs _____	2 by 6
Braces at corners _____	1 by 6
Braces diagonally from center frame _____	1 by 8

(5) Platform planks shall be at least 2- by 10-inch nominal size. The ends of the planks shall overlap the bearers of the squares and each plank shall be supported by not less than three squares.

(6) 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.

(7) Scaffolds shall be level and set upon a firm foundation. [Order 73-5, § 296-24-82525, filed 5/9/73 and Order 73-4, § 296-24-82525, filed 5/7/73.]

WAC 296-24-82527 Horse scaffolds. (1) Horse scaffolds shall not be constructed or arranged more than two tiers or 10 feet in height.

(2) The members of the horses shall be not less than those specified in Table D-19.

(3) Horses shall be spaced not more than 5 feet for medium duty and not more than 8 feet for light duty.

(4) When arranged in tiers, each horse shall be placed directly over the horse in the tier below.

(5) On all scaffolds arranged in tiers, the legs shall be nailed down to the planks to prevent displacement or thrust and each tier shall be substantially cross braced.

TABLE D-19

MINIMUM DIMENSIONS FOR HORSE SCAFFOLD MEMBER

Members:	Dimensions (inches)
Horizontal members or bearers _____	3 by 4
Legs _____	1 1/4 by 4 1/2
Longitudinal brace between legs _____	1 by 6
Gusset brace at top of legs _____	1 by 8
Half diagonal braces _____	1 1/4 by 4 1/2

(6) Horses or parts which have become weak or defective shall not be used.

(7) Guardrails not less than 2 by 4 inches or the equivalent and not less than 36 inches or more than 42 inches high with a mid-rail, when required, of 1- by 4-inch lumber or equivalent and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17). [Order 73-5, § 296-24-82527, filed 5/9/73 and Order 73-4, § 296-24-82527, filed 5/7/73.]

WAC 296-24-82529 Needle beam scaffold.

(1) Wood needle beams shall be in accordance with WAC 296-24-82503(5) and (9) and shall be not less than 4 by 6 inches in size, with the greater dimension placed in a vertical direction. Metal beams or the equivalent conforming to WAC 296-24-82503(4) and (8) may be used.

(2) Ropes or hangers shall be provided for supports. The span between supports on the needle beam shall not exceed 10 feet for 4- by 6-inch timbers. Rope supports shall be equivalent in strength to 1-inch diameter first-grade manila rope.

(3) 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 one-half hitch.

(4) 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 1 foot and not more than 18 inches.

(5) When one needle beam is higher than the other or when the platform is not level the platform shall be secured against slipping.

(6) All unattached tools, bolts, and nuts used on needle beam scaffolds shall be kept in suitable containers.

(7) One end of a needle beam scaffold may be supported by a permanent structural member conforming to WAC 296-24-82503(4) and (8).

(8) Each man working on a needle beam scaffold 20 feet or more above the ground or floor and working with both hands, shall be protected by a safety life belt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall. [Order 73-5, § 296-24-82529, filed 5/9/73 and Order 73-4, § 296-24-82529, filed 5/7/73.]

WAC 296-24-82531 Plasterers', decorators', and large area scaffolds. (1) Plasterers', decorators', lathers', and ceiling workers' inside scaffolds shall be constructed in accordance with the general requirements set forth for independent wood pole scaffolds.

(2) Guardrails not less than 2 by 4 inches nominal lumber or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of 1- by 4-inch nominal lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17).

(3) All platform planks shall be laid with the edges close together to the point where material cannot fall through.

(4) When independent pole scaffold platforms are erected in sections such sections shall be provided with connecting runways equipped with substantial guardrails. [Order 73-5, § 296-24-82531, filed 5/9/73 and Order 73-4, § 296-24-82531, filed 5/7/73.]

WAC 296-24-82533 Interior hung scaffolds. (1) An interior hung scaffold should be hung or suspended from the roof structure or substantial ceiling beams.

(2) The suspended steel wire rope shall conform to WAC 296-24-82503(22). Wire may be used providing the strength requirements of WAC 296-24-82503(22) are met.

(3) For hanging wood scaffolds, the following minimum nominal size material is recommended:

(a) Supporting bearers 2 by 9 inches on edge.

(b) Planking 2 by 9 inches or 2 by 10 inches, with maximum span 7 feet for heavy duty and 10 feet for light duty or medium duty.

(4) 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.

(5) When a hanging scaffold is supported by means of wire rope, such wire 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.

(6) All overhead supporting members shall be inspected and checked for strength before the scaffold is erected.

(7) Guardrails not less than 2 by 4 inches nominal lumber or the equivalent and not less than 36 inches or more than 42 inches high, with a mid-rail, when required, of at least 1- by 4-inch lumber or equivalent, and toeboards, shall be installed at all open sides on all scaffolds more than 8 feet above the ground or floor. Toeboards shall be a minimum of 4 inches nominal lumber in height. Wire mesh shall be installed in accordance with WAC 296-24-82503(17). [Order 73-5, § 296-24-82533, filed 5/9/73 and Order 73-4, § 296-24-82533, filed 5/7/73.]

WAC 296-24-82535 Ladder-jack scaffolds. (1) All ladder-jack scaffolds shall be limited to light duty and shall not exceed a height of 20 feet above the floor or ground.

(2) All ladders used in connection with ladder-jack scaffolds shall be heavy-duty ladders and shall be designed and constructed in accordance with WAC 296-24-780 through WAC 296-24-78009 and WAC 296-24-795 through WAC 296-24-79507.

(3) 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.

(4) Ladders used in conjunction with ladder jacks shall be so placed, fastened, held, or equipped with devices so as to prevent slipping.

(5) The wood platform planks shall be not less than 2 inches nominal in thickness. Both metal and wood platform planks shall overlap the bearing surface not less than 12 inches. The span between supports for wood shall not exceed 8 feet. Platform width shall be not less than 18 inches.

(6) Not more than two persons shall occupy any given 8 feet of any ladder-jack scaffold at any one time. [Order 73-5, § 296-24-82535, filed 5/9/73 and Order 73-4, § 296-24-82535, filed 5/7/73.]

WAC 296-24-82537 Window-jack scaffolds. (1) Window-jack scaffolds shall be used only for the purpose of working at the window opening through which the jack is placed.

(2) Window jacks shall not be used to support planks placed between one window jack and another or for other elements of scaffolding.

(3) Window-jack scaffolds shall be provided with suitable guardrails unless safety belts with lifelines are attached and provided for the workman. Window-jack scaffolds shall be used by one man only. [Order 73-5, § 296-24-82537, filed 5/9/73 and Order 73-4, § 296-24-82537, filed 5/7/73.]

WAC 296-24-82539 Roofing brackets. (1) Roofing brackets shall be constructed to fit the pitch of the roof.

(2) Brackets shall be secured in place by nailing in addition to the pointed metal projections. The nails shall be driven full length into the roof. When rope supports are used, they shall consist of first-grade manila of at least three-quarter-inch diameter, or equivalent.

(3) A substantial catch platform shall be installed below the working area of roofs more than 20 feet from the ground to eaves with a slope greater than 3 inches in 12 inches without a parapet. In width the platform shall extend 2 feet beyond the projection of the eaves and shall be provided with a safety rail, mid-rail, and toe-board. This provision shall not apply where employees engaged in work upon such roofs are protected by a safety belt attached to a lifeline. [Order 73-5, § 296-24-82539, filed 5/9/73 and Order 73-4, § 296-24-82539, filed 5/7/73.]

WAC 296-24-82541 Crawling boards or chicken ladders. (1) Crawling boards shall be not less than 10 inches wide and 1 inch thick, having cleats 1 x 1 1/2 inches. The cleats shall be equal in length to the width of the board and spaced at equal intervals not to exceed 24 inches. Nails shall be driven through and clinched on the underside. The crawling board shall extend from the ridge pole to the eaves when used in connection with roof construction, repair, or maintenance.

(2) A firmly fastened lifeline of at least three-quarter-inch rope shall be strung beside each crawling board for a handhold.

(3) Crawling boards shall be secured to the roof by means of adequate ridge hooks or equivalent effective means. [Order 73-5, § 296-24-82541, filed 5/9/73 and Order 73-4, § 296-24-82541, filed 5/7/73.]

WAC 296-24-82543 Float or ship scaffolds. (1) Float or ship scaffolds shall support not more than three men and a few light tools, such as those needed for riveting, bolting, and welding. They shall be constructed in accordance with WAC 296-24-82543(2) through (6), unless substitute designs and materials provide equivalent strength, stability, and safety.

(2) The platform shall be not less than 3 feet wide and 6 feet long, made of three-quarter-inch plywood, equivalent to American Plywood Association Grade B-B, Group I, Exterior.

(3) 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 about 6 inches beyond the outer edges of the bearers. Each bearer shall be securely fastened to the platform.

(4) 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.

(5) 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 should 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 a 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.

(6) Each workman shall be protected by a safety lifebelt attached to a lifeline. The lifeline shall be securely attached to substantial members of the structure (not scaffold), or to securely rigged lines, which will safely suspend the workman in case of a fall. [Order 73-5, § 296-24-82543, filed 5/9/73 and Order 73-4, § 296-24-82543, filed 5/7/73.]

WAC 296-24-82545 Scope. WAC 296-24-82501 through WAC 296-24-82543 establish safety requirements for the construction, operation, maintenance, and use of scaffolds used in the construction, alteration, demolition, and maintenance of buildings and structures. [Order 73-5, § 296-24-82545, filed 5/9/73 and Order 73-4, § 296-24-82545, filed 5/7/73.]

WAC 296-24-840 Manually propelled mobile ladder stands and scaffolds (towers). [Order 73-5, § 296-24-840, filed 5/9/73 and Order 73-4, § 296-24-840, filed 5/7/73.]

WAC 296-24-84001 Definitions. The following terms shall have the meaning ascribed in this section when referred to in WAC 296-24-84003 through WAC 296-24-84013 unless the context requires otherwise. (1) Bearer. A horizontal member of a scaffold upon which the platform rests and which may be supported by ledgers.

(2) Brace. A tie that holds one scaffold member in a fixed position with respect to another member.

(3) Climbing Ladder. A separate ladder with equally spaced rungs usually attached to the scaffold structure for climbing and descending.

(4) Coupler. A device for locking together the components of a tubular metal scaffold which shall be designed and used to safely support the maximum intended loads.

(5) Design Working Load. The maximum intended load, being the total of all loads including the weight of the men, materials, equipment, and platform.

(6) Equivalent. Alternative design or features, which will provide an equal degree or factor of safety.

(7) Guardrail. A barrier secured to uprights and erected along the exposed sides and ends of platforms to prevent falls of persons.

(8) Handrail. A rail connected to a ladder stand running parallel to the slope and/or top step.

(9) Ladder Stand. A mobile fixed size self-supporting ladder consisting of a wide flat tread ladder in the form of stairs. The assembly may include handrails.

(10) Ledger (Stringer). A horizontal scaffold member which extends from post to post and which supports the bearer forming a tie between the posts.

(11) Mobile Scaffold (Tower). A light, medium, or heavy duty scaffold mounted on casters or wheels.

(12) Mobile. "Manually propelled."

(13) Mobile Work Platform. Generally a fixed work level one frame high on casters or wheels, with bracing diagonally from platform to vertical frame.

(14) Runner. The lengthwise horizontal bracing and/or bearing members.

(15) Scaffold. Any temporary elevated platform and its necessary vertical, diagonal, and horizontal members used for supporting workmen and materials. (Also known as a scaffold tower.)

(16) Toeboard. A barrier at platform level erected along the exposed sides and ends of a scaffold platform to prevent falls of materials.

(17) Tube and Coupler Scaffold. An assembly consisting of tubing which serves as posts, bearers, braces, ties, and runners, a base supporting the posts, and uprights, and serves to join the various members, usually used in fixed locations.

(18) Tubular Welded Frame Scaffold. A sectional, panel, or frame metal scaffold substantially built up of prefabricated welded sections, which consist of posts and bearers with intermediate connecting members and braced with diagonal or cross braces.

(19) Tubular Welded Sectional Folding Scaffold. A sectional, folding metal scaffold either of ladder frame or inside stairway design, substantially built of prefabricated welded sections, which consist of end frames, platform frame, inside inclined stairway frame and braces, or hinged connected diagonal and horizontal braces, capable of being folded into a flat package when the scaffold is not in use.

(20) Work Level. The elevated platform, used for supporting workmen and their materials, comprising the necessary vertical, horizontal, and diagonal braces, guardrails, and ladder for access to the work platform. [Order 73-5, § 296-24-84001, filed 5/9/73 and Order 73-4, § 296-24-84001, filed 5/7/73.]

WAC 296-24-84003 General requirements. (1) Application. This section is intended to prescribe rules and requirements for the design, construction, and use of mobile work platforms (including ladder stands but not including aerial ladders) and rolling (mobile) scaffolds (towers). This standard is promulgated to aid in providing for the safety of life, limb, and property, by establishing minimum standards for structural design requirements and for the use of mobile work platforms and towers.

(2) Working Loads. (a) Work platforms and scaffolds shall be capable of carrying the design load under varying circumstances depending upon the conditions of use. Therefore, all parts and appurtenances necessary for their safe and efficient utilization must be integral parts of the design.

(b) Specific design and construction requirements are not a part of this section because of the wide variety of materials and design possibilities. However, the design shall be such as to produce a mobile ladder stand or scaffold that will safely sustain the specified loads. The material selected shall be of sufficient strength to meet the test requirements and shall be protected against corrosion or deterioration.

(i) The design working load of ladder stands shall be calculated on the basis of one or more 200-pound persons together with 50 pounds of equipment each.

(ii) The design load of all scaffolds shall be calculated on the basis of:

Light—Designed and constructed to carry a working load of 25 pounds per square foot.

Medium—Designed and constructed to carry a working load of 50 pounds per square foot.

Heavy—Designed and constructed to carry a working load of 75 pounds per square foot.

All ladder stands and scaffolds shall be capable of supporting at least four times the design working load.

(c) Materials used in mobile ladder stands and scaffolds shall be of standard manufacture and conform to specifications of this section for strength, dimensions, and weights, and shall be selected to safely support the design working load.

(d) Nails, bolts, or other 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. (All nails should be immediately withdrawn from dismantled lumber.)

(e) All exposed surfaces shall be free from sharp edges, burrs or other safety hazards.

(3) Work Levels. (a) The maximum work level height shall not exceed four (4) times the minimum or least base dimension of any mobile ladder stand or scaffold. Where the basic mobile unit does not meet this requirement, suitable outrigger frames shall be employed to achieve this least base dimension, or provisions shall be made to guy or brace the unit against tipping.

(b) The minimum platform width for any work level shall not be less than 20 inches for mobile scaffolds (towers). Ladder stands shall have a minimum step width of 16 inches.

(c) The supporting structure for the work level shall be rigidly braced, using adequate cross bracing or diagonal bracing with rigid platforms at each work level.

(d) The steps of ladder stands shall be fabricated from slip resistant treads.

(e) The work level platform of scaffolds (towers) shall be of wood, aluminum, or plywood planking, steel or expanded metal, for the full width of the scaffold, except for necessary openings. Work platforms shall be secured in place. All planking shall be 2-inch (nominal) scaffold

grade minimum 1,500 f. (stress grade) construction grade lumber or equivalent.

(f) All scaffold work levels 8 feet or higher above the ground or floor shall have a standard (4-inch nominal) toeboard.

(g) All work levels 8 feet or higher above the ground or floor shall have a guardrail of 2- by 4-inch nominal lumber or the equivalent installed no less than 36 inches or more than 42 inches high, with a mid-rail, when required, of at least 1- by 4-inch nominal lumber or equivalent.

(h) 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. A landing platform shall be provided at intervals not to exceed 30 feet.

(4) Wheels or Casters. (a) Wheels or casters shall be properly designed for strength and dimensions to support four (4) times the design working load.

(b) All scaffold casters shall be provided with a positive wheel and/or swivel lock to prevent movement. Ladder stands shall have at least two (2) of the four (4) casters and shall be of the swivel type.

(c) 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. [Order 73-5, § 296-24-84003, filed 5/9/73 and Order 73-4, § 296-24-84003, filed 5/7/73.]

WAC 296-24-84005 Mobile tubular welded frame scaffolds. (1) General. Units shall be designed to comply with the requirements of WAC 296-24-84003.

(2) Bracing. Scaffolds shall be properly braced by cross braces and/or diagonal braces for securing vertical members together laterally. The cross braces shall be of a length that will automatically square and align vertical members so the erected scaffold is always plumb, square, and rigid.

(3) Spacing. Spacing of panels or frames shall be consistent with the loads imposed. The frames shall be placed one on top of the other with coupling or stacking pins to provide proper vertical alignment of the legs.

(4) Locking. Where uplift may occur, panels shall be locked together vertically by pins or other equivalent means.

(5) Erection. Only the manufacturer of a scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a registered professional engineer or erected in accordance with instructions furnished by the manufacturer. [Order 73-5, § 296-24-84005, filed 5/9/73 and Order 73-4, § 296-24-84005, filed 5/7/73.]

WAC 296-24-84007 Mobile tubular welded sectional folding scaffolds. (1) General. Units including sectional stairway and sectional ladder scaffolds shall be designed to comply with the requirements of WAC 296-24-84003.

(2) Stairway. An integral stairway and work platform shall be incorporated into the structure of each sectional folding stairway scaffold.

(3) Bracing. 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.

(4) Sectional Folding Stairway Scaffolds. Sectional folding stairway scaffolds shall be designed as medium duty scaffolds except for high clearance. These special base sections shall be designed as light duty scaffolds. When upper sectional folding stairway scaffolds are used with a special high clearance base, the load capacity of the entire scaffold shall be reduced accordingly. The width of a sectional folding stairway scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding stairway scaffold shall not exceed 6 feet.

(5) Sectional Folding Ladder Scaffolds. Sectional folding ladder scaffolds shall be designed as light duty scaffolds including special base (open end) sections which are designed for high clearance. For certain special applications the six-foot (6') folding ladder scaffolds, except for special high clearance base sections, shall be designed for use as medium duty scaffolds. The width of a sectional folding ladder scaffold shall not exceed 4 1/2 feet. The maximum length of a sectional folding ladder scaffold shall not exceed 6 feet 6 inches for a six-foot (6') long unit, 8 feet 6 inches for an eight-foot (8') unit or 10 feet 6 inches for a ten-foot (10') long unit.

(6) End Frames. The end frames of sectional ladder and stairway scaffolds shall be designed so that the horizontal bearers provide supports for multiple planking levels.

(7) Erection. Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer to comply with requirements in this section. [Order 73-5, § 296-24-84007, filed 5/9/73 and Order 73-4, § 296-24-84007, filed 5/7/73.]

WAC 296-24-84009 Mobile tube and coupler scaffolds. (1) Design. Units shall be designed to comply with the applicable requirements of WAC 296-24-84003.

(2) Material. The material used for the couplers shall be of a structural type, such as a drop-forged steel, malleable iron or structural grade aluminum. The use of gray cast iron is prohibited.

(3) Erection. Only the manufacturer of the scaffold or his qualified designated agent shall be permitted to erect or supervise the erection of scaffolds exceeding 50 feet in height above the base, unless such structure is approved in writing by a licensed professional engineer, or erected in accordance with instructions furnished by the manufacturer to comply with requirements in this section. [Order 73-5, § 296-24-84009, filed 5/9/73 and Order 73-4, § 296-24-84009, filed 5/7/73.]

WAC 296-24-84011 Mobile work platforms. (1) Design. Units shall be designed for the use intended and shall comply with the requirements of WAC 296-24-84003.

(2) Base Width. The minimum width of the base of mobile work platforms shall not be less than 20 inches.

(3) Bracing. Adequate rigid diagonal bracing to vertical members shall be provided. [Order 73-5, § 296-24-84011, filed 5/9/73 and Order 73-4, § 296-24-84011, filed 5/7/73.]

WAC 296-24-84013 Mobile ladder stands. (1) Design. Units shall comply with applicable requirements of WAC 296-24-84003.

(2) Base Width. The minimum base width shall conform to WAC 296-24-84003(3) and (a). The maximum 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.

(3) Steps. Steps shall be uniformly spaced, and sloped, with a rise of not less than nine (9) inches, nor more than ten (10) inches, and a depth of not less than seven (7) inches. The slope of the steps section shall be a minimum of fifty-five (55) degrees and a maximum of sixty (60) degrees measured from the horizontal.

(4) Handrails. (a) Units having more than five (5) steps or 60 inches vertical height to the top step shall be equipped with handrails.

(b) Handrails shall be a minimum of 29 inches high. Measurements shall be taken vertically from the center of the step.

(5) Loading. The load (see WAC 296-24-84003(2)(b)(ii)) shall be applied uniformly to a 3 1/2 inches wide area front to back at the center of the width span with a safety factor of four (4). [Order 73-5, § 296-24-84013, filed 5/9/73 and Order 73-4, § 296-24-84013, filed 5/7/73.]

WAC 296-24-855 Other working surfaces. [Order 73-5, § 296-24-855, filed 5/9/73 and Order 73-4, § 296-24-855, filed 5/7/73.]

WAC 296-24-85501 Dockboards (bridge plates). (1) Portable and powered dockboards shall be strong enough to carry the load imposed on them.

(2) Portable dockboards shall be secured in position, either by being anchored or equipped with devices which will prevent their slipping.

(3) Powered dockboards shall be designed and constructed in accordance with Commercial Standard CS202-56 (1961) "Industrial Lifts and Hinged Loading Ramps" published by the U.S. Department of Commerce.

(4) Handholds, or other effective means, shall be provided on portable dockboards to permit safe handling.

(5) Positive protection shall be provided to prevent railroad cars from being moved while dockboards or bridge plates are in position. [Order 73-5, § 296-24-85501, filed 5/9/73 and Order 73-4, § 296-24-85501, filed 5/7/73.]

WAC 296-24-85503 Forging machine area. (1) Machines shall be so located as to give (a) enough clearance between machines so that the movement of one operator will not interfere with the work of another, (b) ample room for cleaning machines and handling the work, including material and scrap. The arrangement of machines shall be such that operators will not stand in aisles.

(2) Aisles shall be provided of sufficient width to permit the free movement of employees bringing and removing material. This aisle space is to be independent of working and storage space and should be defined by marking.

(3) Wood platforms used on the floor in front of machines shall be substantially constructed. [Order 73-5, § 296-24-85503, filed 5/9/73 and Order 73-4, § 296-24-85503, filed 5/7/73.]

WAC 296-24-85505 Veneer machinery. (1) Sides of steam vats shall extend to a height of not less than 36 inches above the floor, working platform, or ground.

(2) Large steam vats divided into sections shall be provided with substantial walkways between sections. Each walkway shall be provided with a standard handrail on each exposed side. These handrails may be removable, if necessary.

(3) Covers shall be removed only from that portion of steaming vats on which men are working and a portable railing shall be placed at this point to protect the operators.

(4) Workman shall not ride or step on logs in steam vats. [Order 73-5, § 296-24-85505, filed 5/9/73 and Order 73-4, § 296-24-85505, filed 5/7/73.]

Part J-2

POWERED PLATFORMS, ETC.

WAC

296-24-870	Power platforms for exterior building maintenance.
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WAC 296-24-870 Power platforms for exterior building maintenance. [Order 73-5, § 296-24-870, filed 5/9/73 and Order 73-4, § 296-24-870, filed 5/7/73.]

WAC 296-24-87001 Definitions. (1) Angulated roping. A system of platform suspension in which the upper wire rope sheaves or suspension points are closer to the plane of the building face than the corresponding attachment points on the platform, thus causing the

platform to press against the face of the building during its vertical travel.

(2) ANSI. American National Standards Institute.

(3) Babbitted fastenings. The method of providing wire rope attachments in which the ends of the wire strands are bent back and are held in a tapered socket by means of poured molten babbitt metal.

(4) Brake-disc type. A brake in which the holding effect is obtained by frictional resistance between one or more faces of discs keyed to the rotating member to be held and fixed discs keyed to the stationary or housing member (pressure between the discs being applied axially).

(5) Brake-self-energizing band type. An essentially unidirectional brake in which the holding effect is obtained by the snubbing action of a flexible band wrapped about a cylindrical wheel or drum affixed to the rotating member to be held, the connections and linkages being so arranged that the motion of the brake wheel or drum will act to increase the tension or holding force of the band.

(6) Brake-shoe type. A brake in which the holding effect is obtained by applying the direct pressure of two or more segmental friction elements held to a stationary member against a cylindrical wheel or drum affixed to the rotating member to be held.

(7) Building face rollers. A specialized form of guide roller designed to contact a portion of the outer face or wall structure of the building, and to assist in stabilizing the operators' platform during vertical travel.

(8) Continuous pressure. Operation by means of buttons or switches, any one of which may be used to control the movement of the working platform or roof car, only as long as the button or switch is manually maintained in the actuating position.

(9) Control. A system governing starting, stopping, direction, acceleration, speed, and retardation of moving members.

(10) Controller. A device or group of devices, usually contained in a single enclosure, which serves to control in some predetermined manner the apparatus to which it is connected.

(11) Electrical ground. A conducting connection between an electrical circuit or equipment and the earth, or some conducting body which serves in place of the earth.

(12) Guide roller. A rotating, bearing-mounted, generally cylindrical member, operating separately or as part of a guide shoe assembly, attached to the platform, and providing rolling contact with building guideways, or other building contact members.

(13) Guide shoe. An assembly of rollers, slide members, or the equivalent, attached as a unit to the operators' platform, and designed to engage with the building members provided for the vertical guidance of the operators' platform.

(14) Interlock. A device actuated by the operation of some other device with which it is directly associated, to govern succeeding operations of the same or allied devices.

(15) Operating device. A pushbutton, lever, or other manual device used to actuate a control.

(16) Powered platform. Equipment to provide access to the exterior of a building for maintenance, consisting of a suspended power-operated working platform, a roof car, or other suspension means, and the requisite operating and control devices.

(17) Rated load. The combined weight of employees, tools, equivalent, and other material which the working platform is designed and installed to lift.

(18) Relay, direction. An electrically energized contactor responsive to an initiating control circuit, which in turn causes a moving member to travel in a particular direction.

(19) Relay, potential for vertical travel. An electrically energized contactor responsive to initiating control circuit, which in turn controls the operation of a moving member in both directions. This relay usually operates in conjunction with direction relays, as covered under the definition "relay direction".

(20) Roof car. A structure for the suspension of a working platform, providing for its horizontal movement to working positions.

(21) Roof-powered platform. A powered platform having the raising and lowering mechanism located on a roof car.

(22) Self-powered platform. A powered platform having the raising and lowering mechanism located on the working platform.

(23) Traveling cable. A cable made up of electrical or communication conductors or both, and providing electrical connection between the working platform and the roof car or other fixed point.

(24) Weatherproof. Equipment so constructed or protected that exposure to the weather will not interfere with its proper operation.

(25) Working platform. The suspended structure arranged for vertical travel which provides access to the exterior of the building or structure.

(26) Yield point. The stress at which the material exhibits a permanent set of 0.2 percent.

(27) Zinc fastenings. The method of providing wire rope attachments in which the splayed or fanned wire ends are held in a tapered socket by means of poured molten zinc. [Order 73-5, § 296-24-87001, filed 5/9/73 and Order 73-4, § 296-24-87001, filed 5/7/73.]

WAC 296-24-87003 General requirements. (1) Application. (a) These standards establish safety requirements for the design, construction, installation, operation, maintenance, inspection, and use of power-operated platforms for exterior building maintenance. The requirements of these standards do not apply to temporary equipment used for construction work; or to devices which are raised and lowered manually.

(b) The purpose of these standards is to provide for the safety of life and limb of users of exterior powered platforms, as well as of others who may be exposed. The equipment described in WAC 296-24-87001 through WAC 296-24-87009 is intended for use by one or more workmen who are engaged in exterior work, such as window cleaning, caulking, metal-polishing, and general exterior building maintenance or repairs.

(2) Existing and New Equipment. These standards apply to all powered platforms installed subsequent to August 27, 1971, with the exception of powered platforms installed for emergency purposes.

(3) Design Requirements. All new powered platforms for exterior building maintenance purchased and used after August 27, 1971, shall meet all of the design, construction, installation, and maintenance requirements of Part II and III of the "American National Standard Safety Requirements for Powered Platforms for Exterior Building Maintenance ANSI A120.1-1970" and of these sections. (Reference shall be made to appropriate parts of ANSI A120.1-1970 for detail specifications for equipment and special installations.)

(4) Limitation. The requirements of these standards apply only to electric powered platforms. It is not the intent of this section to prohibit the use of other types of power. Installation of powered platforms using other types of power is permitted, provided such platforms have adequate protective devices for the type of power used, and otherwise provide for reasonable safety of life and limb to users of equipment and to others who may be exposed.

(5) Types of Powered Platforms. (a) For the purpose of applying this standard, powered platforms are divided into two basic types, Type F and Type T.

(b) Powered platforms designated as Type F shall meet all of the requirements of WAC 296-24-87003(3). A basic requirement of Type F equipment is that the work platform is suspended by at least four wire ropes and designed so that failure of any one wire rope will not substantially alter the normal position of the working platform. Another basic requirement of Type F equipment is that only one layer of hoisting rope is permitted on winding drums. Type F powered platforms may be either roof-powered or self-powered.

(c) Powered platforms designated as Type T shall meet all the requirements of WAC 296-24-87003(3). A basic requirement of Type T equipment is that the working platform is suspended by at least two wire ropes. Failure of one wire rope would not permit the working platform to fall to the ground, but would upset its normal position. The employer shall require employees working on Type T equipment to wear safety belts, which are attached by lifelines to either the working platform or the building structure. Type T powered platform may be either roof-powered or self-powered.

(d) The requirements of these standards apply to powered platforms with winding drum type hoisting machines. It is not the intent of these standards to prohibit powered platforms using other types of hoisting machines such as, but not limited to, traction drum hoisting machines, air powered machines, hydraulic powered machines, and internal combustion machines. Installation of powered platforms with other types of hoisting machines is permitted, provided adequate protective devices are used, and provided reasonable safety of life and limb to users of the equipment and to others who may be exposed is assured. [Order 76-6, § 296-24-87003, filed 3/1/76; Order 73-5, § 296-24-87003, filed 5/9/73 and Order 73-4, § 296-24-87003, filed 5/7/73.]

WAC 296-24-87005 Type F powered platforms. (1) Roof Car, General. (a) A roof car shall be provided whenever it is necessary to move the working platform horizontally to working or storage positions.

(b) The maximum rated speed at which a power traversed roof car may be moved in a horizontal direction shall be 50 feet per minute.

(2) Movement and Positioning of Roof Car. (a) Provision shall be made to protect against having the roof car leave the roof or enter roof areas not designed for travel.

(b) The horizontal motion of the roof cars shall be positively controlled so as to insure proper movement and positioning of the roof car.

(c) Roof car positioning devices shall be provided to insure that the working platform is placed and retained in proper position for vertical travel and during storage.

(d) Mechanical stops shall be provided to prevent the traversing of the roof car beyond its normal limits of travel. Such stops shall be capable of withstanding a force equal to 100 percent of the inertial effect of the roof car in motion with traversing power applied.

(e) The operating device of a power-operated roof car for traversing shall be located on the roof car, the working platform, or both, and shall be of the continuous pressure weatherproof electric type. If more than one operating device is provided, they shall be so arranged that traversing is possible only from one operating device at a time.

(i) The operating device shall be so connected that it is not operable until:

(A) The working platform is located at its uppermost position of travel and is not in contact with the building face or fixed vertical guides in the face of the building; and

(B) All protective devices and interlocks are in a position for traversing.

(3) Roof Car Stability. Roof car stability shall be determined by either WAC 296-24-87005(3)(a) or WAC 296-24-87005(3)(b) whichever is greater.

(a) The roof car shall be continuously stable, considering overturning moment as determined by 125 percent rated load, plus maximum dead load and the prescribed wind loading.

(b) The roof car and its anchorages shall be capable of resisting accidental over-tensioning of the wire ropes suspending the working platform and this calculated value shall include the effect of one and one-half times the value. For this calculation, the simultaneous effect of one-half wind load shall be included, and the design stresses shall not exceed those referred to in WAC 296-24-87003(3).

(c) If the load on the motors is at any time in excess of three times that required for lifting the working platform with its rated load, the motor shall stall.

(4) Access to the Roof Car. Safe access to the roof car and from the roof car to the working platform shall be provided. If the access to the roof car at any point of its travel is not over the roof area or where otherwise necessary for safety, self-closing, self-locking gates shall be provided. Applicable provisions of the American National Standard Safety Requirements for Floor and Wall

Openings, Railings and Toeboard, A12.1-1967, shall apply.

(5) Means for Maintenance, Repair, and Storage. Means shall be provided to run the roof car away from the roof perimeter, where necessary, and to provide a safe area for maintenance, repairs, and storage. Provisions shall be made to secure the machine in the stored position. (For stored machines subject to wind forces, see special design and anchorage requirements for "wind forces" in Part II, section 10.5.1.1 of ANSI A120.1-1970, American National Standards Safety Requirements for Powered Platforms for Exterior Building Maintenance.)

(6) General Requirements for Working Platforms. The working platform shall be of girder or truss construction and shall be adequate to support its rated load under any position of loading, and comply with the provisions set forth in WAC 296-24-87003(3).

(7) Load Rating Plate. Each working platform shall bear a manufacturer's load rating plate, conspicuously posted; stating the maximum permissible rated load. Load rating plates shall be made of noncorrosive material and shall have letters and figures stamped, etched, or cast on the surface. The minimum height of the letters and figures shall be one-fourth inch.

(8) Minimum Size. The working platform shall have a minimum net width of 24 inches.

(9) Guard Rails. Working platforms shall be furnished with permanent guard rails not less than 36 inches high, and not more than 42 inches high at the front (building side). At the rear, and on the sides, the rail shall not be less than 42 inches high. An intermediate guardrail shall be provided around the entire platform between the top guardrail and the toeboard.

(10) Toeboards. A 4-inch toeboard shall be provided along all sides of the working platform.

(11) Open Spaces Between Guardrails and Toeboards. The spaces between the intermediate guardrail and platform toeboard on the building side of the working platform, and between the top guardrail and the toeboard on other sides of the platform, shall be filled with metallic mesh or similar material that will reject a ball 1 inch in diameter. The installed mesh shall be capable of withstanding a load of 100 pounds applied horizontally over any area of 144 square inches. If the space between the platform and the building face does not exceed 8 inches, and the platform is restrained by guides, the mesh may be omitted on the front side.

(12) Flooring. The platform flooring shall be of the nonskid type, and if of open construction, shall reject a 9/16-inch diameter ball, or be provided with a screen below the floor to reject a 9/16 inch diameter ball.

(13) Access Gates. Where access gates are provided, they shall be self-closing and self-locking.

(14) Operating Device for Vertical Movement of the Working Platform. (a) The normal operating device for the working platform shall be located on the working platform and shall be of the continuous pressure weatherproof electric type.

(b) The operating device shall be operable only when all electrical protective devices and interlocks on the working platform are in position for normal service, and

the roof car, if provided, is at an established operating point.

(15) Emergency Electric Operative Device. (a) In addition, on roof-powered platforms, an emergency electric operating device shall be provided near the hoisting machine for use in the event of failure of the normal operating device for the working platform, or failure of the traveling cable system. The emergency operating device shall be mounted in a locked compartment and shall have a legend mounted thereon reading: "For Emergency Operation Only. Establish Communication With Personnel on Working Platform Before Use."

(b) A key for unlocking the compartment housing the emergency operating device shall be mounted in a break-glass receptacle located near the emergency operating device.

(16) Manual Cranking for Emergency Operation. Emergency operation of the maindrive machine may be provided to allow manual cranking. This provision for manual operation shall be designed so that not more than two persons will be required to perform this operation. The access to this provision shall include a means to automatically make the machine inoperative electrically while under the emergency manual operation. The design shall be such that the emergency brake is operative at or below governor tripping speed during manual operation.

(17) Arrangement and Guarding of Hoisting Equipment. (a) Hoisting equipment shall consist of a power-driven drum or drum contained in the roof car (roof-powered platforms) or contained on the working platform (self-powered platform).

(b) The hoisting equipment shall be power-operated in both up and down directions.

(c) Guard or other protective devices shall be installed wherever rotating shafts or other mechanisms or gears may expose personnel to a hazard.

(d) Friction devices or clutches shall not be used for connecting the main driving mechanism to the drum or drums. Belt- or chain-driven machines are prohibited.

(18) Hoisting Motors. (a) Hoisting motors shall be electric and of weatherproof construction.

(b) Hoisting motors shall be in conformance with applicable provisions of WAC 296-24-87005(22), Electrical wiring and equipment.

(c) Hoisting motors shall be directly connected to the hoisting machinery. Motor couplings, if used, shall be of steel construction.

(19) Brakes. The hoisting machine(s) shall have two independent braking means, each designed to stop and hold the working platform with 125 percent of rated load.

(20) Hoisting Ropes and Rope Connections. (a) Working platforms shall be suspended by wire ropes of either 6x19 or 6x37 classification, preformed or nonpreformed.

(b) The minimum grade of the wire rope shall be improved plow steel. Ropes shall be fabricated of drawn galvanized or bright wire. Drawn galvanized wire rope shall be fabricated of individual wires on which the zinc coating has been applied at an intermediate size, and the

wire then drawn to finished size and to the same tolerances and with the same mechanical properties as for uncoated wire of equal grade.

(c) The minimum factor of safety shall be ten, and shall be calculated by the following formula:

$$F = \frac{S \times N}{W}$$

where

S = Manufacturer's rated breaking strength of one rope.

N = Number of ropes under load.

W = Maximum static load on all ropes with the platform and its rated load at any point of its travel.

(d) Hoisting ropes shall be sized to conform with the required factor of safety, but in no case shall the size be less than five-sixteenths-inch diameter.

(e) Winding drums shall have at least three turns of rope remaining when the platform has landed at the lowest possible point of its travel.

(f) The lengthening or repairing of wire rope by the joining of two or more lengths is prohibited.

(g) The nondrum ends of the hoisting ropes shall be provided with individual shackle rods which will permit individual adjustment of rope lengths, if required.

(h) Reverse bends in rope arrangement should be avoided. More than two reverse bends in each rope is prohibited.

(21) Rope Tag Data. (a) A metal data tag shall be securely attached to one of the wire rope fastenings. This data tag shall bear the following wire rope data:

- (i) The diameter in inches.
- (ii) Construction classification.
- (iii) Whether nonpreformed or preformed.
- (iv) The grade of material used.
- (v) The manufacturer's rated breaking strength.
- (vi) Name of the manufacturer of the rope.
- (vii) The month and year the ropes were installed.
- (viii) Name of the person or firm who installed ropes.

(b) Noncorrosive metal data tags shall be used. The minimum height of the letters, stamped or etched, shall be one-sixteenth inch.

(c) A new tag shall be installed at each rope renewal. When ropes are refastened, the original tag shall be retained and a supplemental tag showing the date of refastening and the name of the person or firm who refastened the ropes shall be provided.

(22) Electrical Wiring and Equipment. (a) All electrical equipment and wiring shall conform to the requirements of the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968), except as modified by ANSI A120.1-1970 "American National Standard Safety Requirements for Powered Platforms for Exterior Building Maintenance".

NOTE: For detail design specifications for electrical equipment, see Part 2, ANSI A120.1-1970.

(b) All motors and operation and control equipment shall be supplied from a single power source.

(c) The power supply for the powered platform shall be an independent circuit supplied through a fused disconnect switch.

(d) Electrical conductor parts of the power supply system shall be protected against accidental contact.

(e) Electrical grounding shall be provided.

(i) Provision for electrical grounding shall be included with the power-supply system.

(ii) Controller cabinets, motor frames, hoisting machines, the working platform, roof car and roof car track system, and noncurrent carrying parts of electrical equipment, where provided, shall be grounded.

(iii) The controller, where used, shall be so designed and installed that a single ground or short circuit will not prevent both the normal and final stopping device from stopping the working platform.

(iv) Means shall be provided on the roof car and working platform for grounding portable electric tools.

(v) The working platform shall be grounded through a grounding connection in a traveling cable. Electrically powered tools utilized on the working platform shall be grounded.

(f) Electrical receptacles located on the roof or other exterior location shall be of a weatherproof type and shall be located so as not to be subject to contact with water or accumulated snow. The receptacles shall be grounded and the electric cable shall include a grounding conductor. The receptacle and plug shall be a type designed to avoid hazard to persons inserting or withdrawing the plug. Provision shall be made to prevent application of cable strain directly to the plug and receptacle.

(g) Electric runway conductor systems shall be of the type designed for use in exterior locations and shall be located so as not to be subject to contact with water or accumulated snow. The conductors, collectors, and disconnecting means shall conform to the same requirements as those for cranes and hoists in Article 610 of the National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968). A grounded conductor shall parallel the power conductors and be so connected that it cannot be opened by the disconnecting means. The system shall be designed to avoid hazard to persons in the area.

(h) Electrical protective devices and interlocks of the weatherproof type shall be provided.

(i) Where the installation includes a roof car, electric contact(s) shall be provided and so connected that the operating devices for the working platform shall be operative only when the roof car is located and mechanically retained at an established operating point.

(j) Where the powered platform includes a power-operated roof car, the operating device for the roof car shall be inoperative when the roof car is mechanically retained at an established operating point.

(k) An electric contact shall be provided and so connected that it will cause the down direction relay for vertical travel to open if the tension in the traveling cable exceeds safe limits.

(l) An automatic overload device shall be provided to cut off the electrical power to the circuit in all hoisting

motors for travel in the up direction, should the load applied to the hoisting ropes at either end of the working platform exceed 125 percent of its normal tension with rated load, as shown on the manufacturer's data plate on the working platform.

(m) An automatic device shall be provided for each hoisting rope which will cut off the electrical power to the hoisting motor or motors in the down direction and apply the brakes if any hoisting rope becomes slack.

(n) Upper and lower directional limit devices shall be provided to prevent the travel of the working platform beyond the normal upper and lower limits of travel.

(o) Operation of a directional limit device shall prevent further motion in the appropriate direction, if the normal limit of travel has been reached.

(p) Directional limit devices, if driven from the hoisting machine by chains, tapes, or cables, shall incorporate a device to disconnect the electric power from the hoisting machine and apply both the primary and secondary brakes in the event of failure of the driving means.

(q) Final Terminal Stopping Devices of the Working Platform:

(i) Final terminal stopping devices for the working platform shall be provided as a secondary means of preventing the working platform from over-traveling at the terminals.

(ii) The device shall be set to function as close to each terminal landing as practical, but in such a way that under normal operating conditions it will not function when the working platform is stopped by the normal terminal stopping device.

(iii) Operation of the final terminal stopping device shall open the potential relay for vertical travel, thereby disconnecting the electric power from the hoisting machine, and applying both the primary and secondary brakes.

(iv) The final terminal stopping device for the upper limit of travel shall be mounted so that it is operated directly by the motion of the working platform itself.

(r) Emergency stop switches shall be provided in or adjacent to each operating device.

(s) Emergency stop switches shall:

(i) Have red operating buttons or handles.

(ii) Be conspicuously and permanently marked "Stop".

(iii) Be the manually opened and manually closed type.

(iv) Be positively opened with the opening not solely dependent on springs.

(t) The manual operation of an emergency stop switch associated with an operating device for the working platform shall open the potential relay for vertical travel, thereby disconnecting the electric power from the hoisting machine and applying both the primary and secondary brakes.

(u) The manual operation of the emergency stop switch associated with the operating device for a power-driven roof car shall cause the electrical power to the traverse machine to be interrupted, and the traverse machine brake to apply.

(23) Requirements for Emergency Communications. (a) Communication equipment shall be provided for each powered platform for use in an emergency.

(b) Two-way communication shall be established between personnel on the roof and personnel on the stalled working platform before any emergency operation of the working platform is undertaken by personnel on the roof.

(c) The equipment shall permit two-way voice communication between the working platform and

(i) Designated personnel continuously available while the powered platform is in use; and

(ii) Designated personnel on roof-powered platforms, undertaking emergency operation of the working platform by means of the emergency operating device located near the hoisting machine.

(d) The emergency communication equipment shall be one of the following types:

(i) Telephone connected to the central telephone exchange system; or

(ii) Telephones on a limited system or an approved two-way radio system, provided designated personnel are available to receive a message during the time the powered platform is in use. [Order 76-6, § 296-24-87005, filed 3/1/76; Order 73-5, § 296-24-87005, filed 5/9/73 and Order 73-4, § 296-24-87005, filed 5/7/73.]

WAC 296-24-87007 Type T powered platforms. (1) Roof Car. The requirements of WAC 296-24-87005(1) through WAC 296-24-87005(5) shall apply to Type T powered platforms.

(2) Working Platform. The requirements of WAC 296-24-87005(6) through WAC 296-24-87005(16) apply to Type T powered platforms.

(a) The working platform shall be suspended by at least two wire ropes.

(b) The maximum rated speed at which the working platform of self-powered platforms may be moved in a vertical direction shall not exceed 35 feet per minute.

(3) Hoisting Equipment. The requirements of WAC 296-24-87005(17) and (18) shall apply to Type T powered platforms.

(4) Brakes. Brakes requirements of WAC 296-24-87005(19) shall apply.

(5) Hoisting Ropes and Rope Connections. (a) WAC 296-24-87005(20)(a) through (f) and (h) shall apply to Type T powered platforms.

(b) Adjustable shackle rods in WAC 296-24-87005(20)(g) shall apply to Type T powered platforms if the working platform is suspended by more than two wire ropes.

(6) Electrical Wiring and Equipment. (a) The requirements of WAC 296-24-87005(22)(a) through (f) shall apply to Type T powered platforms. "Circuit protection limitation," "powered platform electrical service system," all operating services and control equipment shall comply with the specifications contained in Part 2, section 26, of ANSI A 120.1-1970.

(b) For electrical protective devices the requirements of WAC 296-24-87005(22)(a) through (h) shall apply to Type T powered platforms. Requirements for the "circuit potential limitation" shall be in accordance with

the specifications contained in part 2, section 26, of ANSI A 120.1-1970.

(7) Emergency Communications. All the requirements of WAC 296-24-87005(23) shall apply to Type T powered platforms.

(8) Safety Belts and Lifelines. (a) Each employee on the working platform of type T powered platforms shall be provided with a safety belt with means for attachment to a lifeline on the roof or to the working platform. It is recommended that safety belts, lines and other components, including fastening means and anchorages to the working platform, building, or structure, be capable of withstanding a static load of 4,000 pounds without damage or permanent deformation of any part.

(b) Fastening devices should be of the self-closing type, equipped with a locking device to prevent accidental opening of the fastening device.

(c) Harness-type belts are recommended. If body-type belts are used, it is recommended that the portion of the belt bearing on the front of the wearer's body have a minimum width of 3 inches.

(d) It is recommended that the line used to connect the belt to the platform, or to a lifeline attached to the building, have a maximum length of 5 feet. [Order 73-5, § 296-24-87007, filed 5/9/73 and Order 73-4, § 296-24-87007, filed 5/7/73.]

WAC 296-24-87009 Inspections and tests. (1) Inspections and Tests of New Installations and Alterations. All powered platform installations shall, on their completion, and before being placed in service, be subjected to an acceptance test in the field to determine that all parts of the installation conform to applicable requirements of these safety and health standards, and that all safety and operating equipment functions as required. A similar inspection and test shall be made following a major alteration to an existing installation.

(2) Periodic Inspections and Tests. Each installation shall undergo a periodic inspection and test at least every 12 months. All parts of the equipment shall be inspected, and where necessary, tested to determine that they are in safe operating condition.

(3) Maintenance, Inspections and Tests. Each installation shall undergo a maintenance inspection and test every 30 days, except where the cleaning cycle is less than 30 days, such inspection and test shall be made prior to each cleaning cycle. The results of these inspections and tests shall be recorded in a log which is available for review by the Director or his designated representative. Each log entry shall include the date of the inspection or test and shall be signed by the person making the inspection or test.

(4) Special Inspection of Governors and Secondary Brakes. (a) Special inspections and tests of the governor and secondary braking system shall be made at intervals not exceeding 1 year.

(b) The inspection and test shall include a verification that the initiating device for the secondary breaking operates at the proper overspeed.

(c) If adequate tests cannot be performed in the field, the initiating device may be removed from the powered

platform and sent to a shop equipped to make such a test.

(d) The inspection shall include a verification of the proper functioning of the secondary brake. If an adequate test cannot be performed in the field, the hoisting machine may be removed from the building and sent to a shop equipped to make such a test.

(e) If any hoisting machine or initiating device for the secondary brake system is removed from the building for testing, all reinstalled and directly related components shall be reinspected prior to returning the powered platform installation to service.

(5) Adverse Weather. The operation of powered platforms during severe adverse weather conditions is prohibited.

(6) Maintenance. (a) Required Maintenance. All parts of equipment on which safe operation depends shall be maintained in proper working order so that they perform the function for which they are intended.

(b) Broken or worn parts, worn switch contacts, brushes, and short flexible conductors of electrical devices, which may interfere with safe operation, shall be replaced promptly. Electrical receptacles and plugs shall be replaced promptly when worn or damaged. All electrical connections shall be kept tight.

(c) Components of the electrical service system and traveling cables shall be replaced when damaged or substantially abraded.

(d) Gears, shafts, bearings, brakes, and hoisting drums shall be maintained in proper alignment. Gears shall be replaced promptly when there is evidence of appreciable wear.

(7) Cleaning. (a) Controller contactors and relays shall be kept clean and free from dirt.

(b) All other parts shall be kept clean, if their proper functioning would be affected by the presence of dirt or other contaminants.

(8) Periodic Reshacking of Hoisting Ropes. The hoisting ropes shall be reshacked at the nondrum ends at intervals not exceeding 24 months. In reshacking the ropes, a sufficient length shall be cut from the end of the rope to remove damaged or fatigued portions.

(9) Making Safety Devices Inoperative. No person shall at any time make any required safety device or electrical protective device inoperative, except when necessary during tests, inspections, and maintenance. Immediately upon completion of such test, inspections, and maintenance, the devices shall be restored to their normal operating condition.

(10) Damaged Rope. Wire ropes shall be replaced whenever there are six or more broken wires in any one lay of the wire rope, or whenever the ropes are damaged or in a deteriorated condition.

(11) Roof Track System. Roof track systems tiedowns, or similar equipment, if provided, shall be maintained in proper working order so that they perform the function for which they are intended.

(12) Building Face Guiding Members. T-rails, indented mullions, or equivalent guides located in the face of the building, if provided, shall be maintained in proper working order so that they perform the function for which they are intended. Brackets for cable stabilizers, if

provided, shall similarly be maintained in proper working order. [Order 73-5, § 296-24-87009, filed 5/9/73 and Order 73-4, § 296-24-87009, filed 5/7/73.]

WAC 296-24-885 Vehicle-mounted elevating and rotating work platforms. [Order 76-6, § 296-24-885, filed 3/1/76; Order 73-5, § 296-24-885, filed 5/9/73 and Order 73-4, § 296-24-885, filed 5/7/73.]

WAC 296-24-88501 Definitions. (1) Aerial device. Any vehicle-mounted device, telescoping or articulating or both, which is used to position workmen and/or materials.

(2) Aerial ladder. An aerial device consisting of a single- or multiple-section extensible ladder.

(3) Articulating boom platform. An aerial device with two or more hinged boom sections.

(4) Extensible boom platform. An aerial device (except ladders) with a telescopic or extensible boom. Telescopic derricks with personnel platform attachments shall be considered to be extensible boom platforms when used with a personnel platform.

(5) Electric line truck. A truck used to transport men, tools and material, and to serve as a traveling workshop for electric power line construction and maintenance work. It is sometimes equipped with a boom and auxiliary equipment for setting poles, digging holes and elevating material and/or men.

(6) Mobile unit. A combination of an aerial device, its vehicle, and related equipment.

(7) Platform. Any personnel-carrying device (basket or bucket) which is a component of an aerial device.

(8) Vehicle. Any carrier that is not manually propelled.

(9) Vertical tower. An aerial device designed to elevate a platform in a substantially vertical axis. [Order 76-6, § 296-24-88501, filed 3/1/76; Order 73-5, § 296-24-88501, filed 5/9/73 and Order 73-4, § 296-24-88501, filed 5/7/73.]

WAC 296-24-88503 General requirements. (1) Unless otherwise provided in this section, aerial devices (aerial lifts) acquired on or after July 1, 1975, 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 A92.2-1969, including appendix. Aerial lifts acquired for use before July 1, 1975 which do not meet the requirements of ANSI A92.2-1969, may not be used after July 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 devices include the following types of vehicle-mounted aerial devices used to elevate personnel and/or material to jobsites above ground:

- (a) Extensible boom platforms;
- (b) Aerial ladders;
- (c) Articulating boom platforms;
- (d) Vertical towers, and
- (e) A combination of any of the above.

(f) 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.

(2) 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.

(3) The requirements of this section do not apply to firefighting equipment or electric line trucks used in the construction and maintenance of power distribution lines by telecommunications employees, line clearance tree trimming employees, electric contractor employees and electric utility employees, except with the requirement that a vehicle be a stable support for the aerial device.

(4) When operating aerial lifts proximate to, under, over, by or near electric power lines, the requirements of subsection (4) shall apply.

(a) The following clearances shall be maintained:

(i) For lines rated at 50kV or less, the minimum clearance between the lines and any part of the aerial lift shall be at least 10 feet;

(ii) When the lines are rated in excess of 50kV, the minimum clearance between the lines and any part of the aerial lift shall be at least 10 feet plus 0.4 inch for each kilovolt in excess of 50kV, or twice the length of the line insulator, but never less than 10 feet;

(iii) The requirements set forth in subdivision (4)(a) do not apply.

(A) Where the electric power transmission or distribution lines have been de-energized and visibly grounded at the point of work, or where insulating barriers, not a part of or an attachment to the aerial lift, have been erected to prevent physical contact with the lines.

(B) Proximity warning devices may be used, but not in lieu of meeting the requirements contained in this subsection.

(c) The owner of the lines or his authorized representative shall be notified and provided with all pertinent information before the commencement of operations near electric lines.

(d) Any overhead wire shall be considered to be an energized line until the owner of the line or his authorized representative states that it is deenergized. [Order 76-6, § 296-24-88503, filed 3/1/76; Order 73-5, § 296-24-88503, filed 5/9/73 and Order 73-4, § 296-24-88503, filed 5/7/73.]

WAC 296-24-88505 Specific requirements. (1) Ladder Trucks and Tower Trucks. Before the truck is moved for highway travel, aerial ladders shall be secured in the lower traveling position by the locking device above the truck cab, and the manually operated device at the base of the ladder, or by other equally effective means (e.g., cradles which prevent rotation of the ladder in combination with positive acting linear actuators).

(2) Extensible and Articulating Boom Platforms.

(a) Lift controls shall be tested each day prior to use to determine that such controls are in safe working condition.

(b) Only trained persons shall operate an aerial lift.

(c) Belting off to an adjacent pole, structure, or equipment while working from an aerial lift shall not be permitted.

(d) 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.

(e) A body belt shall be worn and a lanyard attached to the boom or basket when working from an aerial lift.

(f) Boom and basket load limits specified by the manufacturer shall not be exceeded.

(g) The brakes shall be set and outriggers, when used, shall be positioned on pads or a solid surface. Wheel chocks shall be installed before using an aerial lift on an incline.

(h) An aerial lift truck may not be moved when the boom is elevated in a working position with men in the basket, except for equipment which is specifically designed for this type of operation in accordance with the provisions of WAC 296-24-88503(1)(2).

(i) 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 overriding 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.

(j) Climbers shall not be worn while performing work from an aerial lift.

(k) 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 subdivision (h).

(3) Bursting Safety Factor. All critical hydraulic and pneumatic components shall comply with the provisions of the American National Standards Institute standard, ANSI A92.2-1969, Section 4.9 Bursting Safety Factor. 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 a bursting safety factor of at least two to one.

(4) Welding Standards. All welding shall conform to the following Automotive Welding Society (AWS) Standards, as applicable:

(a) Standard Qualification Procedure, AWS B3.0-41.

(b) Recommended Practices for Automotive Welding Design, AWS D8.4-61.

(c) Standard Qualification of Welding Procedures and Welders for Piping and Tubing, AWS D10.9-69.

(d) Specifications for Welding Highway and Railway Bridges, AWS D2.0-69. [Rev. 2-5-76] [Order 76-6, § 296-24-88505, filed 3/1/76.]

WAC 296-24-900 Manlifts. [Order 73-5, § 296-24-900, filed 5/9/73 and Order 73-4, § 296-24-900, filed 5/7/73.]

WAC 296-24-90001 Definitions. (1) Handhold (Handgrip). A handhold is a device attached to the belt which can be grasped by the passenger to provide a means of maintaining balance.

(2) Open type. One which has a handgrip surface fully exposed and capable of being encircled by the passenger's fingers.

(3) Closed type. A cup-shaped device, open at the top in the direction of travel of the step for which it is to be used, and closed at the bottom into which the passenger may place his fingers.

(4) Limit switch. A device, the purpose of which is to cut off the power to the motor and apply the brakes to stop the carrier in the event that a loaded step passes the terminal landing.

(5) Manlift. A device consisting of a power-driven endless belt moving in one direction only, and provided with steps or platforms and handholds attached to it for the transportation of personnel from floor to floor.

(6) Rated speed. Rated speed is the speed for which the device is designed and installed.

(7) Split-rail switch. An electric limit switch operated mechanically by the rollers on the manlift steps. It consists of an additional hinged or "split" rail, mounted on the regular guiderail, over which the step rollers pass. It is spring-loaded in the "split" position. If the step supports no load, the rollers will "bump" over the switch; if a loaded step should pass over the section, the split rail will be forced straight, tripping the switch and opening the electrical circuit.

(8) Step (platform). A step is a passenger carrying unit.

(9) Travel. The travel is the distance between the centers of the top and bottom pulleys. [Order 73-5, § 296-24-90001, filed 5/9/73 and Order 73-4, § 296-24-90001, filed 5/7/73.]

WAC 296-24-90003 General requirements. (1) Application. These standards apply to the construction, maintenance, inspection, and operation of manlifts in relation to accident causing hazards. Manlifts covered by these standards consist of platforms or brackets and accompanying handholds mounted on, or attached to an endless belt, operating vertically in one direction only and being supported by, and driven through pulleys, at the top and bottom. These manlifts are intended for conveyance of persons only. It is not intended that these standards cover moving stairways, elevators with enclosed platforms ("Paternoster" elevators), gravity lifts, nor conveyors used only for conveying material. These standards apply to manlifts used to carry only personnel trained and authorized by the employer in their use.

(2) Exceptions for New and Existing Equipment. The purpose of these standards is to provide reasonable safety for life and limb.

(3) Design Requirements. All new manlift installations and equipment installed after the effective date of these standards shall meet the design requirements of the "American National Safety Standard for Manlifts ANSI A90.1-1969", and the requirements of this section.

(4) Reference to Other Codes. The following codes are applicable to this section. Safety Code for Mechanical Power Transmission Apparatus ANSI B15.1-1953 (R 1958) and WAC 296-24-150 through WAC 296-24-20533; National Electrical Code, NFPA 70-1971; ANSI C1-1971 (Rev. of 1968) and WAC 296-45-590; Safety Code for Fixed Ladders, ANSI A14.3-1956 and Safety Requirements for Floor and Wall Openings, Railings and Toeboards, ANSI A12.1-1967 and WAC 296-24-735 through WAC 296-24-85505.

(5) Floor Openings. (a) Allowable Size. Floor openings for both the "up" and "down" runs shall be not less than 28 inches nor more than 36 inches in width for a 12-inch belt not less than 34 inches nor more than 38 inches for a 14-inch belt; and not less than 36 inches nor more than 40 inches for a 16-inch belt and shall extend not less than 24 inches, nor more than 28 inches from the face of the belt.

(b) Uniformity. All floor openings for a given manlift shall be uniform in size and shall be approximately circular, and each shall be located vertically above the opening below it.

(6) Landing. (a) Vertical Clearance. The clearance between the floor or mounting platform and the lower edge for the conical guard above it required by WAC 296-24-90003(7) shall not be less than 7 feet 6 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.

(b) Clear Landing Space. The landing space adjacent to the floor openings shall be free from obstruction and kept clear at all times. This landing space shall be at least 2 feet in width from the edge of the floor opening used for mounting and dismounting.

(c) Lighting and Landing. Adequate lighting not less than 5-foot candles, shall be provided at each floor landing at all times when the lift is in operation.

(d) Landing Surface. The landing surfaces at the entrances and exits to the manlift shall be constructed and maintained as to provide safe footing at all times.

(e) Emergency Landings. Where there is a travel of 50 feet or more between floor landings, one or more emergency landings shall be provided so that there will be a landing (either floor or emergency) for every 25 feet or less of manlift travel.

(i) Emergency landings shall be accessible from both the "up" and "down" rungs of the manlift and shall give access to the ladder required in WAC 296-24-90003(12).

(ii) Emergency landings shall be completely enclosed with a standard railing and toeboard.

(iii) Platforms constructed to give access to bucket elevators or other equipment for the purpose of inspection, lubrication, and repair may also serve as emergency landings under this rule. All such platforms will then be considered part of the emergency landing and shall be provided with standard railings and toeboards.

(7) Guards on Underside of Floor Openings. (a) Fixed Type. On the ascending side of the manlift floor openings shall be provided with a bevel guard or cone meeting the following requirements:

(i) The cone shall make an angle of not less than 45° with the horizontal. An angle of 60° or greater shall be used where ceiling heights permit.

(ii) The lower edge of this guard shall extend at least 42 inches outward from any handhold on the belt. It shall not extend beyond the upper surface of the floor above.

(iii) The cone shall be made of not less than No. 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.

(b) Floating Type. In lieu of the fixed guards specified in WAC 296-24-90003(7)(a) a floating type safety cone may be used, such floating cones to be mounted on hinges at least 6 inches below the under side of the floor and so constructed as to actuate a limit switch should a force of 2 pounds be applied on the edge of the cone closest to the hinge. The depth of this floating cone need not exceed 12 inches.

(8) Protection of Entrances and Exits. (a) Guardrail Requirement. The entrances and exits at all floor landings affording access to the manlift shall be guarded by a maze (staggered railing) or a handrail equipped with self-closing gates.

(b) Construction. The rails shall be standard guardrails with toeboards meeting the provisions of the Safety Requirements for Floor and Wall Openings, Railings and Toeboards, ANSI A12.1-1967 and WAC 296-24-750 through WAC 296-24-75011.

(c) Gates. Gates, if used, shall open outward and shall be self-closing. Corners of gates shall be rounded.

(d) Maze. Maze or staggered openings shall offer no direct passage between enclosure and outer floor space.

(e) Except where building layout prevents, entrances at all landings shall be in the same relative position.

(f) If located in buildings to which the public has access, such manlift or manlifts shall be located in an enclosure protected by self-closing spring-locked doors. Keys to such doors shall be limited to authorized personnel.

(9) Guards for Openings. (a) Construction. The floor opening at each landing shall be guarded on sides not used for entrance or exit by a standard railing and toeboard or by panels or wire mesh of not less than Number 10 U.S. gage, expanded metal of not less than Number 13 U.S. gage or sheet metal of equivalent strength.

(b) Guardrails in Stairwells. When belt manlift is installed in a stairwell a standard guardrail shall be placed between the floor openings of the manlift and the stairways.

(c) Height and Location. Such rails or guards shall be at least forty-two (42) inches in height on the "up" running side and sixty-six (66) 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 WAC 296-24-90003(9)(a) or may consist of vertical or horizontal bars which will reject a ball six (6) inches in diameter. Rails or guards shall be located not more than one (1) foot from the edge of the floor opening.

(d) Safeguards Required. Expanded metal, sheet metal or wood guards must be installed to cover the area from the floor to seven (7) feet above the floor on each exposed side of the belt manlift at each floor landing, so persons cannot place their hands in the area where the step rollers travel.

(10) Bottom Arrangement. (a) Bottom Landing. 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 48 inches from the face of the belt. This space shall not be encroached upon by stairs or ladders.

(b) Location of Lower Pulley. The lower (boot) pulley shall be installed so that it is supported by the lowest landing served. The sides of the pulley support shall be guarded to prevent contact with the pulley or the steps.

(c) Mounting Platform. A mounting platform shall be provided in front or to one side of the uprun 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 completes its turn and assumes a horizontal position.

(d) Guardrails. To guard against persons walking under a descending step, the area on the downside of the manlift shall be guarded in accordance with WAC 296-24-90003(8). To guard against a person getting between the mounting platform and an ascending step, the area between the belt and the platform shall be protected by a guardrail.

(11) Top Arrangements. (a) Clearance from Floor. A top clearance shall be provided of at least 11 feet above the top terminal landing. This clearance shall be maintained from a plane through each face of the belt to a vertical cylindrical plane having a diameter 2 feet greater than the diameter of the floor opening, extending upward from the top floor to the ceiling on the up-running side of the belt. No encroachment of structural or machine supporting members within this space will be permitted.

(b) Pulley Clearance. (i) There shall be a clearance of at least 5 feet between the center of the head pulley shaft and any ceiling obstruction.

(ii) The center of the head pulley shaft shall be not less than 6 feet above the top terminal landing.

(c) Emergency Grab Rail. An emergency grab bar or rail and platform shall be provided at the head pulley when the distance to the head pulley is over 6 feet above the top landing, otherwise only a grab bar or rail is to be provided to permit the rider to swing free should the emergency stops become inoperative.

(12) Emergency Exit Ladder. A fixed metal ladder accessible from both the "up" and "down" run of the manlift shall be provided for the entire travel of the manlift. Such ladder shall be in accordance with ANSI A14.3-1956, Safety Code for Fixed Ladders and WAC 296-24-810 through WAC 296-24-81013.

(13) Superstructure Bracing. Manlift rails shall be secured in such a manner as to avoid spreading, vibration, and misalignment.

(14) Illumination. (a) General. Both runs of the manlift shall be illuminated at all times when the lift is in operation. An intensity of not less than 1-foot candle shall be maintained at all points. (However, see WAC 296-24-90003(6)(c) for illumination requirements at landings.)

(b) Control of Illumination. Lighting of manlift runways shall be by means of circuits permanently tied into the building circuits (no switches), 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.

(15) Weather Protection. The entire manlift and its driving mechanism shall be protected from the weather at all times. [Order 76-6, § 296-24-90003, filed 3/1/76; Order 73-5, § 296-24-90003, filed 5/9/73 and Order 73-4, § 296-24-90003, filed 5/7/73.]

WAC 296-24-90005 Mechanical requirements. (1) Machines, general. (a) Brakes. Brakes provided for stopping and holding a manlift shall be inherently self-engaging, by requiring power or force from an external source to cause disengagement. The brake shall be electrically released, and shall be applied to the motor shaft for direct-connected units or to the input shaft for belt-driven units. The brake shall be capable of stopping and holding the manlift when the descending side is loaded with 250 lb on each step.

(b) Belt. (i) The belts shall be of hard-woven canvas, rubber-coated canvas, leather, or other material meeting the strength requirements of WAC 296-24-90003(3) and having a co-efficient of friction such that when used in conjunction with an adequate tension device it will meet the brake test specified in WAC 296-24-90005(1)(a).

(ii) The width of the belt shall be not less than 12 inches for a travel not exceeding 100 feet, not less than 14 inches for a travel greater than 100 feet but not exceeding 150 feet and 16 inches for a travel exceeding 150 feet.

(iii) A belt that has become torn while in use on a manlift shall not be spliced and put back in service.

(iv) 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 (3) feet where the total travel of the manlift does not exceed one hundred (100) feet and not less than four (4) feet, if the travel exceeds one hundred (100) feet.

Where butt splices are used the straps shall extend not less than three (3) feet on one side of the butt for a travel not in excess of one hundred (100) feet, and four (4) feet for a travel in excess of one hundred (100) feet.

For twelve (12) inch belts, the joint shall be fastened with not less than twenty (20) special elevator bolts, each of a minimum diameter of one-quarter (1/4) 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 (14) inches shall be not less than twenty-three (23) and for belt widths of sixteen (16) inches, the number of bolts shall be not less than twenty-seven (27).

(v) Pulleys. Drive pulleys and idler (boot) pulleys shall have a diameter not less than given in Table 1.

TABLE 1

Belt Construction	Minimum Strength (lb. per inch of width)	Minimum Pulley (Diameter inches)
5 ply	1500	20
6 ply	1800	20
7 ply	2100	22

NOTE: Table No. 1 is included solely for the purpose of determining the minimum diameter of pulley required for the listed number of plies of belt construction.

[(vi) Pulley Protection. The machine shall be so designed] and constructed as to catch and hold the driving pulley in event of shaft failure.

(2) Speed. (a) Maximum Speed. No manlift designed for a speed in excess of 80 feet per minute shall be installed.

(3) Platforms or Steps. (a) Minimum Depth. Steps or platforms shall be not less than 12 inches nor more than 14 inches deep, measured from the belt to the edge of the step or platform.

(b) Width. The width of the step or platform shall be not less than the width of the belt to which it is attached.

(c) Distance Between Steps. The distance between steps shall be equally spaced and not less than 16 feet measured from the upper surface of one step to the upper surface of the next step above it.

(d) 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 the approximate horizontal position with the "up" and "down" run of the belt.

(e) 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 non-slip tread securely fastened to it.

(f) Strength of Step Supports. When subjected to a load of 400 pounds applied at the approximate center of the step, step frames, or supports and their guides shall be of adequate strength to:

(i) Prevent the disengagement of any step roller.

(ii) Prevent any appreciable misalignment.

(iii) Prevent any visible deformation of the steps or its support.

(g) Prohibition of Steps Without Handholds. No steps shall be provided unless there is a corresponding handhold above or below it meeting the requirements of WAC 296-24-90005(4). 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.

(4) Handholds. (a) Location. Handholds attached to the belt shall be provided and installed so that they are

not less than 4 feet nor more than 4 feet 8 inches above the step tread. These shall be so located as to be available on the both "up" and "down" run of the belt.

(b) Size. The grab surface of the handhold shall be not less than 4 1/2 inches in width, not less than 3 inches in depth, and shall provide 2 inches of clearance from the belt. Fastenings for handholds shall be located not less than 1 inch from the edge of the belt.

(c) Strength. The handhold shall be capable of withstanding, without damage, a load of 300 pounds applied parallel to the run of the belt.

(d) 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.

(e) Type. All handholds shall be of the closed type.

(5) Up Limit Stops. (a) 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 split-rail switch mechanically operated by the step roller and located not more than 6 inches above the top terminal landing. The second automatic stop device may consist of any of the following:

(i) Any split-rail switch placed 6 inches above and on the side opposite the first limit switch.

(ii) An electronic device.

(iii) A switch actuated by a lever, rod, or plate, the latter to be placed on the "up" side of the head pulley so as to just clear a passing step.

(b) Emergency Stop Switch, treadle type in pit 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.

(c) Manual Reset Location. After the manlift has been stopped by a stop device it shall be necessary to reset the automatic stop manually. The device shall be so located 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.

(d) Cut-off Point. The initial limit stop device shall function so that the manlift will be stopped before the loaded step has reached a point of 24 inches above the top terminal landing.

(e) Electrical Requirements. (i) Where such switches open the main motor circuit directly they shall be of the multipole type.

(ii) Where electronic devices are used they shall be so designed and installed that failure will result in shutting off the power to the driving motor.

(iii) Where flammable vapors or dusts may be present all electrical installations shall be in accordance with the National Electric Code, NFPA 70-1971; ANSI C 1-1971 (Rev. of 1968), requirements for such locations.

(iv) Unless of the oil-immersed type controller contacts carrying the main motor current shall be copper to

carbon or equal, except where the circuit is broken at two or more points simultaneously.

(6) Emergency Stop. (a) General. An emergency stop means shall be provided.

(b) Location. This stop means shall be within easy reach of the ascending and descending runs of the belt.

(c) 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.

(d) Rope. If rope is used, it shall be not less than three-eighths inch in diameter. Wire rope, unless marlin-covered, shall not be used.

(7) Instruction and Warning Signs. (a) Instruction Signs at Landings or Belts. 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.

(i) Such signs shall be of letters not less than 1 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).

(ii) The instructions shall read approximately as follows:

Face the Belt.
Use the Handholds.
To Stop—Pull Rope.

(b) Top Floor Warning Sign and Light. (i) At the top floor an illuminated sign shall be displayed bearing the following wording:

"TOP FLOOR—GET OFF"

Signs shall be in block letters not less than 2 inches in height. This sign shall be located within easy view of an ascending passenger and not more than 2 feet above the top terminal landing.

(ii) In addition to the sign required by WAC 296-24-90005(7), a red warning light of not less than 40-watt rating shall be provided immediately below the upper landing terminal and so located as to shine in the passenger's face.

(c) Bottom of Manlift Warning Signs, Light and Buzzer. (i) Sign or Light. A sign or light warning the passenger he is approaching the 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.

(ii) An Electric Buzzer. An electric buzzer shall be installed five (5) 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.

(d) Visitor Warning. A conspicuous sign have the following legend—AUTHORIZED PERSONNEL ONLY—shall be displayed at each landing. The sign shall be of block letters not less than 2 inches in height and shall be of a color offering high contrast with the background color. [Order 74-27, § 296-24-90005, filed 5/7/74; Order 73-5, § 296-24-90005, filed 5/9/73 and Order 73-4, § 296-24-90005, filed 5/7/73.]

WAC 296-24-90007 Operating rules. (1) Proper Use of Manlifts. No freight, packaged goods, pipe, lumber, or construction materials of any kind shall be handled on any manlift. [Order 73-5, § 296-24-90007, filed 5/9/73 and Order 73-4, § 296-24-90007, filed 5/7/73.]

WAC 296-24-90009 Periodic inspection. (1) Frequency. All manlifts shall be inspected by a competent designated person at intervals of not more than 30 days. Limit switches shall be checked weekly. Manlifts found to be unsafe shall not be operated until properly repaired.

(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.
Floor Landings.
Guardrails.
Lubrication.
Limit Switches.
Warning Signs and Lights.
Illumination.
Drive Pulley.
Bottom (boot) Pulley and Clearance.
Pulley Supports.
Motor.
Driving Mechanism.
Brake.
Electrical Switches.
Vibration and Misalignment.
"Skip" on up or down run when mounting step (indicating worn gears).

(3) Inspection Log. A written record shall be kept of findings at each inspection. Records of inspection shall be made available to the Director of Labor and Industries or his duly authorized representative. [Order 73-5, § 296-24-90009, filed 5/9/73 and Order 73-4, § 296-24-90009, filed 5/7/73.]

Part K

COMPRESSED GAS AND COMPRESSED GAS EQUIPMENT

WAC

296-24-920	Inspection of compressed gas cylinders.
296-24-92001	Definitions.
296-24-92003	General requirements.
296-24-92005	Inspection of low-pressure cylinders—Exempt from the hydrostatic test including acetylene cylinders.
296-24-92007	Low-pressure cylinders subject to hydrostatic testing.
296-24-92009	High-pressure cylinders.
296-24-92011	Internal inspection.
296-24-930	Safety relief devices for compressed gas cylinders.
296-24-93001	Definitions.
296-24-93003	General requirements.
296-24-935	Safety relief devices for cargo and portable tanks storing compressed gases.

296-24-93501	Definitions.
296-24-93503	General requirements.
296-24-940	Air receivers.
296-24-94001	General requirements.
296-24-94003	Installation and equipment requirements.

WAC 296-24-920 Inspection of compressed gas cylinders. [Order 73-5, § 296-24-920, filed 5/9/73 and Order 73-4, § 296-24-920, filed 5/7/73.]

WAC 296-24-92001 - Definitions. (1) High- and low-pressure cylinders. High-pressure cylinders means those cylinders with a marked service pressure of 900 p.s.i. or greater; low-pressure cylinders are those with a marked service pressure less than 900 p.s.i.

(2) Minimum allowable wall thickness. The minimum allowable wall thickness means the minimum wall thickness required by the specification under which the cylinder was manufactured.

(3) Dents. Dents (in cylinders) means deformations caused by the cylinder coming in contact with a blunt object in such a way that the thickness of metal is not materially impaired.

(4) Cuts, gouges, or digs. Cuts, gouges, or digs (in cylinders) means deformations caused by contact with a sharp object in such a way as to cut into or upset the metal of the cylinder, decreasing the wall thickness at that point.

(5) Corrosion or pitting. Means corrosion or pitting in cylinders involving the loss of wall thickness by corrosive media.

NOTE: There are several kinds of pitting or corrosion to be considered.

(6) Isolated pitting. Means isolated pits of small cross-section which do not effectively weaken the cylinder wall but are indicative of possible complete penetration and leakage.

NOTE: Since the pitting is isolated the original wall is essentially intact.

(7) Line corrosion. Means pits which are not isolated but are connected or nearly connected to others in a narrow band or line.

NOTE: This condition is more serious than isolated pitting. Line corrosion frequently occurs in the area of intersection of the footing and bottom of a cylinder. This is sometimes referred to as "crevice corrosion."

(8) General corrosion. Means corrosion which covers considerable surface areas of the cylinder.

NOTE: It reduces the structural strength. It is often difficult to measure or estimate the depth of general corrosion because direct comparison with the original wall cannot always be made. General corrosion is often accompanied by pitting.

(9) "DOT" means the U.S. Department of Transportation. [Order 73-5, § 296-24-92001, filed 5/9/73 and Order 73-4, § 296-24-92001, filed 5/7/73.]

WAC 296-24-92003 General Requirements. (1) Application. (a) Each employer shall determine that compressed gas cylinders under his control are in a safe condition to the extent that this can be determined by visual, and other inspection required by WAC 296-24-920 through WAC 296-24-92011.

(b) The requirements contained in these standards are not intended to apply to cylinders manufactured under specification DOT (ICC)-3HT (49 CFR Ch.1). Separate requirements covering service life and standards for visual inspection of these cylinders are contained in Compressed Gas Association Pamphlet C-8, "Standard for Requalification of ICC-3HT Cylinders."

(2) Quality of Inspection. Experience in the inspection of cylinders is an important factor in determining the acceptability of a given cylinder for continued service.

NOTE: Users lacking this experience and having doubtful cylinders should return them to a manufacturer of the same type of cylinders for reinspection.

[Order 73-5, § 296-24-92003, filed 5/9/73 and Order 73-4, § 296-24-92003, filed 5/7/73.]

WAC 296-24-92005 Inspection of low-pressure cylinders exempt from the hydrostatic test including acetylene cylinders. (1) Application. This section covers cylinders of the type that are exempt from the hydrostatic retest requirements of the DOT by virtue of their exclusive use in certain noncorrosive gas service. They are not subject to internal corrosion and do not require internal shell inspection.

(2) Preparation for Inspection. Rust, scale, caked paint, etc., shall be removed from the exterior surface so that the surface can be adequately observed. Facilities shall be provided for inverting the cylinder to facilitate inspection of the bottom. This is important because experience has shown this area to be the most susceptible to corrosion.

(3) Exterior Inspection. Cylinders shall be checked as outlined below for corrosion, general distortion, or any other defect that might indicate a weakness which would render it unfit for service.

(a) To fix corrosion limits for all types, designs, and sizes of cylinders, and include them in this section is not practicable. Cylinders shall meet the requirements of WAC 296-24-92005(3). Failure to meet any of these requirements is of itself cause for rejection of a cylinder.

(i) A cylinder shall be rejected when the tare weight is less than 95 percent of the original tare weight marked on the cylinder. When determining tare weight, be sure that the cylinder is empty.

(ii) A cylinder shall be rejected when the remaining wall in an area having isolated pitting only is less than one-third of the minimum allowable wall thickness as determined under WAC 296-24-92005(3)(b) through WAC 296-24-92005(3)(d).

(iii) A cylinder shall be rejected when line corrosion on the cylinder is 3 inches in length or over and the remaining wall is less than three-fourths of the minimum allowable wall thickness or when line corrosion is less than 3 inches in length and the remaining wall thickness

is less than one-half the minimum allowable wall thickness as determined under WAC 296-24-92005(3)(b) through WAC 296-24-92005(3)(d).

(iv) A cylinder shall be rejected when the remaining wall in an area of general corrosion is less than one-half of the minimum allowable wall thickness as determined under WAC 296-24-92005(3)(b) through WAC 296-24-92005(3)(d).

(b) To use the criteria in WAC 296-24-92005(3)(a), it is necessary to know the original wall thickness of the cylinder or the minimum allowable wall thickness. Table M-1 lists the minimum allowable wall thickness under DOT specifications (49 CFR Ch.1) for a number of common size low-pressure cylinders.

TABLE M-1

Cylinder size O.D. x length (inches)	DOT Specification marking	Nominal water capacity (pounds)	Minimum allowable wall thickness (inches)
15 x 46	4B240 ¹	239	0.128
14 13/16 x 47	4E240	239	.140
14 15/16 x 46	4BA240	239	.086
14 11/16 x 28 3/8	4BA240	143	.086
11 29/32 x 32 11/16	4BA240	95	.078
11 29/32 x 18 11/32	4BA240	48	.078

¹ Without longitudinal seam.

(c) When the wall thickness of the cylinder at manufacture is not known, and the actual wall thickness cannot be measured, this cylinder shall be rejected when the inspection reveals that the deepest pit in a general corrosion area exceeds three sixty-fourths inch. This is arrived at by considering that in no case shall the pitting exceed one-half the minimum allowable wall thickness which is 0.064 inch. When a pit measures 0.043 inch (approximately three sixty-fourths inch) in a corrosion area, general corrosion will already have removed 0.021 inch of the original wall and the total pit depth as compared to the initial wall will be 0.064 inch.

(d) When the original wall thickness at manufacture is known, or the actual wall thickness is measured, this thickness less one and one-half times the maximum measured pit depth shall be 0.064 inch or greater. If it is less, the cylinder shall be rejected.

(e) Dents are of concern where the metal deformation is sharp and confined, or where they are near a weld. Where metal deformation is not sharp, dents of larger magnitude can be tolerated.

(f) Where denting occurs so that any part of the deformation includes a weld, the maximum allowable dent depth shall be one-fourth inch.

(g) When denting occurs so that no part of the deformation includes a weld, the cylinder shall be rejected if the depth of the dent is greater than one-tenth of the mean diameter of the dent.

(h) Cuts, gouges, or digs reduce the wall thickness of the cylinder and in addition are considered to be stress raisers. Depth limits are set in these standards; however,

cylinders shall be rejected at one-half of the limit set whenever the length of the defect is 3 inches or more.

(i) When the original wall thickness at manufacture is not known, and the actual wall thickness cannot be measured a cylinder shall be rejected if the cut, gouge, or dig exceeds one-half of the minimum allowable wall thickness as determined under WAC 296-24-92005(3)(b) through WAC 296-24-92005(3)(d).

(ii) When the original wall thickness at manufacture is known, or the actual wall thickness is measured, a cylinder shall be rejected if the original wall thickness minus the depth of the defect is less than one-half of the minimum allowable wall thickness as determined under WAC 296-24-92005(3)(b) through WAC 296-24-92005(3)(d).

(i) Leaks can originate from a number of sources, such as defects in a welded or brazed seam, defects at the threaded opening, or from sharp dents, digs, gouges, or pits.

(i) To check for leaks, the cylinder shall be charged and carefully examined. All seams and pressure openings shall be coated with a soap or other suitable solution to detect the escape of gas. Any leakage is cause for rejection.

(ii) Safety relief devices as defined in WAC 296-24-93001(1) shall be tested for leaks before a charged cylinder is shipped from the cylinder filling plant.

(j) After fire damage, cylinders shall be carefully inspected for evidence of exposure to fire.

(i) Common evidences of exposure to fire are:

(A) Charring or burning of the paint or other protective coat.

(B) Burning or sintering of the metal.

(C) Distortion of the cylinder.

(D) Melted out fuse plugs.

(E) Burning or melting of valve.

(ii) The evaluation of fire damage by DOT Regulations state that, "A cylinder which has been subjected to the action of fire must not again be placed in service until it has been properly reconditioned", in accordance with 49 CFR 173.34(f). The general intent of this requirement is to remove from service cylinders which have been subject to the action of fire which has changed the metallurgical structure or the strength properties of the steel, or in the case of acetylene cylinders caused breakdown of porous filler. This is normally determined by visual examination as covered above with particular emphasis to the condition of the protective coating. If the protective coating has been burnt off or if the cylinder body is burnt, warped, or distorted, it is assumed that the cylinder has been overheated and 49 CFR 173.34(f) shall be complied with. If, however, the protective coating is only dirtied from smoke or other debris, and is found by examination to be intact underneath, the cylinder shall not be considered affected within the scope of this requirement.

(k) Cylinders are manufactured with a reasonably symmetrical shape. Cylinders which have definite visible bulges shall be removed from service and evaluated. Cylinders shall be rejected when a variation of 1 percent or more is found in the measured circumferences or in

peripheral distances measured from the valve spud to the center seam (of equivalent fixed point).

(l) Cylinder necks shall be examined for serious cracks, folds, and flaws. Neck cracks are normally detected by testing the neck during charging operations with a soap solution.

(m) Cylinder neck threads shall be examined whenever the valve is removed from the cylinder. Cylinders shall be rejected if the required number of effective threads are materially reduced, or if a gas tight seal cannot be obtained by reasonable valving methods. Gages shall be used to measure the number of effective threads.

(n) If the valve is noticeably tilted the cylinder shall be rejected.

(o) The footing and heading of cylinders may become so distorted through service abuse that they no longer perform their functions:

(i) To cause the cylinder to remain stable and upright.

(ii) To protect the valve. Rings shall be examined for distortion; for looseness, and for failure of welds. Appearances may often warrant rejection of the cylinder. [Order 73-5, § 296-24-92005, filed 5/9/73 and Order 73-4, § 296-24-92005, filed 5/7/73.]

WAC 296-24-92007 Low-pressure cylinders subject to hydrostatic testing. (1) Application. Cylinders covered in this section are low-pressure cylinders other than those covered in WAC 296-24-92005 through WAC 296-24-92005(3)(o)(ii). They differ essentially from such cylinders in that they require a periodic hydrostatic retest which includes an internal and external examination. Defect limits for the external examination are prescribed in WAC 296-24-92005 through WAC 296-24-92005(3)(o)(ii), with exceptions for aluminum cylinders shown in WAC 296-24-92007(4).

(2) Preparation for Inspection. Flammable gas cylinders shall be purged before being examined with a light. Lamps used for flammable gas cylinder inspection shall be explosion proof.

(3) Internal Inspection. Cylinders shall be inspected internally at least every time the cylinder is periodically retested. The examination shall be made with a light of sufficient intensity to clearly illuminate the interior walls.

(4) External Inspection of Aluminum Cylinders. The inspection requirements of WAC 296-24-92005 through WAC 296-24-92005(3)(o)(ii) shall be met, except as follows:

(a) Aluminum cylinders shall be rejected when impairment to the surface (corrosion or mechanical defect) exceeds a depth where the remaining wall is less than three-fourths of the minimum allowable wall thickness required by the specification under which the cylinder was manufactured.

(b) Aluminum cylinders subjected to the action of fire shall be removed from service. [Order 73-5, § 296-24-92007, filed 5/9/73 and Order 73-4, § 296-24-92007, filed 5/7/73.]

WAC 296-24-92009 High-pressure cylinders. (1) Application. High-pressure cylinders are those with a

marked service pressure of 900 p.s.i. or higher. They are seamless; no welding is permitted. The great bulk of such cylinders are of the 3A or 3AA types under DOT Specifications (49 CFR Ch. 1).

(2) Preparation for Inspection. (a) Cylinders shall be cleaned for inspection so that the inside and outside surfaces and all conditions can be observed. This shall include removal of scale and caked paint from the exterior and the thorough removal of internal scale. Cylinders with interior coating shall be examined for defects in the coating. If the coating is defective, it shall be removed.

(b) A good inspection light of sufficient intensity to clearly illuminate the interior wall is mandatory for internal inspection. Flammable gas cylinders shall be purged before being examined with a light. Lamps for flammable gas cylinder inspection shall be explosion proof.

(3) Exterior Inspection. (a) To fix corrosion limits for all types, designs, and sizes of cylinders, and include them in this section, is not practicable. Considerable judgment is required in evaluating cylinders fit for service. Experience is a major factor, aside from strength considerations for high pressure cylinders.

(b) When the original wall thickness of the cylinder is not known, and the actual wall thickness cannot be measured, the cylinder shall be rejected if corrosion exceeds one thirty-second inch in depth. This is arrived at by subtracting from the minimum allowable wall at manufacture (0.221 inch), the limiting wall in service (0.195 inch), to give the maximum allowable corrosion limit of 0.026 inch, the equivalent of one thirty-second inch.

(c) When the wall thickness is known, or the actual wall thickness is measured, the difference between this known wall and the limiting value establishes the maximum corrosion figure. The normal hot forged cylinder of this size will have a measured wall of about 0.250 inch. Comparison of this with the limiting wall thickness shows that defects up to about one-sixteenth inch are allowable provided, of course, that the actual wall is measured or is known.

(d) Cylinders with general corrosion are evaluated by subjecting them to a hydrostatic test. Thus, a cylinder with an elastic expansion of 227 cc. or greater shall be rejected. If areas of pronounced pitting are included within the general corrosion, the depth of such pitting should also be measured (with the high spots of the actual surface as a reference plane) and the criteria established in the first example apply. Thus, the maximum corrosion limit would be one thirty-second inch when the wall was not known.

(e) Any defect of appreciable depth having a sharp bottom is a stress raiser and even though a cylinder may be acceptable from a stress standpoint, it is common practice to remove such defects. After any such repair operation, verification of the cylinder strength and structure shall be made by a hydrostatic test of other suitable means.

(f) Dents can be tolerated when the cylinder wall is not deformed excessively or abruptly. Generally speaking, dents are accepted up to a depth of about one-sixteenth inch when the major diameter of the dent is equal

to or greater than 32 times the depth of the dent. Sharper dents than this are considered too abrupt and shall require rejection of the cylinder. On small diameter cylinders these general rules may have to be adjusted. Considerations of appearance play a major factor in the evaluation of dents.

(g) Cylinders with arc or torch burns shall be removed from service. Defects of this nature may be recognized by one of the following conditions:

(i) Removal of metal by scarfing or cratering.

(ii) A sentering or burning of the base metal.

(iii) A hardened heat affected zone. A simple method for verifying the presence of small arc burns is to file the suspected area. The hardened heat affected zone. A simple method for verifying the presence of small arc burns is to file the suspected area. The hardened zone will resist filing as compared to the softer base metal.

(h) Cylinders are normally produced with a symmetrical shape. Cylinders with distinct visual bulges shall be removed from service until the nature of the defect is determined. Some cylinders may have small discontinuities related to the manufacturing process—mushroomed bottoms, offset shoulders, etc. These usually can be identified and are not normally cause for concern.

(i) Cylinders shall be carefully inspected for evidences of exposure to fire. (See WAC 296-24-92005(3)(j)).

(j) Cylinder necks shall be examined for serious cracks, folds, and flaws. (See WAC 296-24-92005(3)(l) and (m). [Order 73-5, § 296-24-92009, filed 5/9/73 and Order 73-4, § 296-24-92009, filed 5/7/73.]

WAC 296-24-92011 Internal inspection. (1) Cylinders shall be inspected internally at least every time the cylinder is periodically retested. This examination shall be made with a light of sufficient intensity to clearly illuminate the interior walls.

(2) A hammer test consists of tapping a cylinder a light blow with a suitably sized hammer. A cylinder, emptied of liquid content, with a clean internal surface, standing free, will have a clear ring. Cylinders with internal corrosion will give a duller ring dependent upon the amount of corrosion and accumulation of foreign material. Such cylinders shall be investigated. The hammer test is very sensitive and is an easy, quick, and convenient test that can be made without removing the valve before each charging. It is an invaluable indicator of internal corrosion. [Order 73-5, § 296-24-92011, filed 5/9/73 and Order 73-4, § 296-24-92011, filed 5/7/73.]

WAC 296-24-930 Safety relief devices for compressed gas cylinders. [Order 73-5, § 296-24-930, filed 5/9/73 and Order 73-4, § 296-24-930, filed 5/7/73.]

WAC 296-24-93001 Definitions. (1) Safety relief device. A "safety relief device" is a device intended to prevent rupture of a cylinder under certain conditions of exposures. (The term as used herein shall include the approach channel, the operating parts, and the discharge channel.)

(2) Approach channel. An "approach channel" is the passage or passages through which gas must pass from the cylinder to reach the operating parts of the safety relief device.

(3) Discharge channel. A "discharge channel" is the passage or passages beyond the operating parts through which gas must pass to reach the atmosphere exclusive of any piping attached to the outlet of the device.

(4) Safety relief device channel. A "safety relief device channel" is the channel through which gas released by operation of the device must pass from the cylinder to the atmosphere exclusive of any piping attached to the inlet or outlet of the device.

(5) Operating part. The "operating part" of a safety relief device is the part of a safety relief device that normally closes the safety discharge channel but when moved from this position as a result of the action of heat or pressure, or a combination of the two, permits escape of gas from the cylinder.

(6) Frangible disc. A "frangible disc" is an operating part in the form of a disc, usually of metal and which is so held as to close the safety relief device channel under normal conditions. The disc is intended to burst at a predetermined pressure to permit the escape of gas.

(7) Pressure opening. A "pressure opening" is the orifice against which the frangible disc functions.

(8) Rated Bursting pressure. A "rated bursting pressure" of a frangible disc is the maximum pressure for which the disc is designed to burst when in contact with the pressure opening for which it was designed when tested.

(9) Fusible plug. A "fusible plug" is an operating part in the form of a plug of suitable low melting material, usually a metal alloy, which closes the safety relief device channel under normal conditions and is intended to yield or melt at a predetermined temperature to permit the escape of gas.

(10) Yield temperature. The "yield temperature" of a fusible plug is the temperature at which the fusible metal or alloy will yield when tested.

(11) Reinforced fusible plug. A "reinforced fusible plug" is a fusible plug consisting of a core of suitable material having a comparatively high yield temperature surrounded by a low-melting point fusible metal of the required yield temperature.

(12) Combination frangible disc-fusible plug. A "combination frangible disc-fusible plug" is a frangible disc in combination with a low melting point fusible metal, intended to prevent its bursting at its predetermined bursting pressure unless the temperature also is high enough to cause yielding or melting of the fusible metal.

(13) Safety relief valve. A "safety relief valve" is a safety relief device containing an operating part that is held normally in a position closing the safety relief device channel by spring force and is intended to open and to close at predetermined pressures.

(14) Combination safety relief valve and fusible plug. A "combination safety relief valve and fusible plug" is a safety relief device utilizing a safety relief valve in combination with a fusible plug. This combination device may be an integral unit or separate units and is intended

to open and to close at predetermined pressures or to open at a predetermined temperature.

(15) Set pressure. The "set pressure" of a safety relief valve is the pressure marked on the valve and at which it is set to start-to-discharge.

(16) Start-to-discharge pressure. The "start-to-discharge pressure" of a safety relief valve is the pressure at which the first bubble appears through a water seal of not over 4 inches in the outlet of the safety relief valve.

(17) Flow capacity. The "flow capacity" of a safety relief device is the capacity in cubic feet per minute of free air discharged at the required flow rating pressure.

(18) Flow rating pressure. The "flow rating pressure" is the pressure at which a safety relief device is rated for capacity.

(19) Nonliquefied compressed gas. A "nonliquefied compressed gas" is a gas, other than a gas in solution which under the charging pressure, is entirely gaseous at a temperature of 70°F.

(20) Liquefied compressed gas. A "liquefied compressed gas" is a gas which, under the charging pressure, is partially liquid at a temperature of 70°F. A flammable compressed gas which is normally nonliquefied at 70°F. but which is partially liquid under the charging pressure and temperature, shall follow the requirements for liquefied compressed gases.

(21) Compressed gas in solution. A "compressed gas in solution" (Acetylene) is a nonliquefied gas which is dissolved in a solvent.

(22) Pressurized liquid compressed gas. A "pressurized liquid compressed gas" is a compressed gas other than a compressed gas in solution, which cannot be liquefied at a temperature of 70°F., and which is maintained in the liquid state at a pressure not less than 40 p.s.i.a. by maintaining the gas at a temperature less than 70°F.

(23) Test pressure of the cylinder. The "test pressure of the cylinder" is the minimum pressure at which a cylinder must be tested as prescribed in DOT specifications for compressed gas cylinders 41 CFR Ch. 1.

(24) Free air or free gas. "Free air" or "free gas" is air or gas measured at a pressure of 14.7 pounds per square inch absolute and a temperature of 60°F.

(25) DOT regulations. As used in these standards "DOT regulations" refers to the U.S. Department of Transportation Regulations for Transportation of Explosives and Other Dangerous Articles by Land and Water in Rail Freight, Express and Baggage Services and by Motor Vehicle (Highway) and Water, including Specifications for Shipping Containers, Code of Federal Regulations, Title 49, Parts 171 to 178. [Order 73-5, § 296-24-93001, filed 5/9/73 and Order 73-4, § 296-24-93001, filed 5/7/73.]

WAC 296-24-93003 General requirements. (1) Application. Compressed gas cylinder, portable tanks, and cargo tanks shall have pressure relief devices installed and maintained in accordance with Compressed Gas Association Pamphlets S-1.1-1963 and 1965 addenda and S-1.2-1963.

(2) Types of Safety Relief Devices. Types of safety relief devices as covered by this section are designated as follows:

(a) Type CG-1: Frangible disc.

(b) Type CG-2: Fusible plug or reinforced fusible plug utilizing a fusible alloy with yield temperature not over 170°F., nor less than 157°F. (165°F. nominal).

(c) Type CG-3: Fusible plug or reinforced fusible plug utilizing a fusible alloy with yield temperature not over 220°F., nor less than 208°F. (212°F. nominal).

(d) Type CG-4: Combination frangible disc-fusible plug, utilizing a fusible alloy with yield temperature not over 170°F., nor less than 157°F. (165°F. nominal)

(e) Type CG-5: Combination frangible disc-fusible plug, utilizing a fusible alloy with yield temperature not over 220°F., nor less than 208°F. (212°F. nominal)

(f) Type CG-7: Safety relief valve.

(g) Type CG-8: Combination safety relief valve and fusible plug.

(3) Specifications and Tests. All safety relief devices covered by this section shall meet the design, construction, marking and test specification of the "Compressed Gas Association Safety Relief Device Standards Part 1-Cylinders for Compressed Gases: S1.1-1963."

(4) Specific Requirements for Safety Relief Devices.

(a) Compressed gas cylinders, which under the Regulations of the Department of Transportation must be equipped with safety relief devices, shall be considered acceptable when equipped with devices of proper construction, location, and discharge capacity under the conditions prescribed in Table 1 of the Compressed Gas Associations Standard S-1.1-1963.

(b) Only replacement parts or assemblies provided by the manufacturer shall be used unless the advisability of interchange is proved by adequate tests.

(c) When a frangible disc is used with a compressed gas cylinder, the rated bursting pressure of the disc shall not exceed the minimum required test pressure of the cylinder with which the device is used, except for DOT-3E cylinders (49 CFR Ch. 1) the rated bursting pressure of the device shall not exceed 4,500 pounds per square inch gage (p.s.i.g.).

(d) When a safety relief valve is used on a compressed gas cylinder, the flow rating pressure shall not exceed the minimum required test pressure of the cylinder on which the safety relief valve is installed and the reseating pressure shall not be less than the pressure in a normally charged cylinder at 130°F.

(e) When fittings and piping are used on either the upstream or downstream side or both of a safety relief device or devices, the passages shall be so designed that the flow capacity of the safety relief device will not be reduced below the capacity required for the container on which the safety relief device assembly is installed, nor to the extent that the operation of the device could be impaired. Fittings, piping, and method of attachment shall be designed to withstand normal handling and the pressures developed when the device or devices function.

(f) No shutoff valve shall be installed between the safety relief devices and the cylinder.

(5) Maintenance Requirements for Safety Relief Devices. (a) As a precaution to keep cylinder safety relief

devices in reliable operating condition, care shall be taken in the handling or storing of compressed gas cylinders to avoid damage. Care shall also be exercised to avoid plugging by paint or other dirt accumulation of safety relief device channels or other parts which could interfere with the functioning of the device. Only qualified personnel shall be allowed to service safety relief devices.

(b) Each time a compressed gas cylinder is received at a point for refilling, all safety relief devices shall be examined externally for corrosion, damage, plugging of external safety relief device channels, and mechanical defects such as leakage or extrusion of fusible metal. If there is any doubt regarding the suitability of the safety relief device for service the cylinder shall not be filled until it is equipped with a suitable device. [Order 73-5, § 296-24-93003, filed 5/9/73 and Order 73-4, § 296-24-93003, filed 5/7/73.]

WAC 296-24-935 Safety relief devices for cargo and portable tanks storing compressed gases. [Order 73-5, § 296-24-935, filed 5/9/73 and Order 73-4, § 296-24-935, filed 5/7/73.]

WAC 296-24-93501 Definitions. (1) Cargo tank. A "cargo tank" means any container designed to be permanently attached to any motor vehicle or other highway vehicle and in which is to be transported any compressed gas. The term "cargo tank" shall not be construed to include any tank used solely for the purpose of supplying fuel for the propulsion of the vehicle or containers fabricated under specifications for cylinders.

(2) Portable tank. A "portable tank" means any container designed primarily to be temporarily attached to a motor vehicle, other vehicle, railroad car other than tank car, or marine vessel, and equipped with skids, mountings, or accessories to facilitate handling of the container by mechanical means, in which is to be transported any compressed gas. The term "portable tank" shall not be construed to include any cargo tank, any tank car tank or any tank of the DOT-106A and DOT-110A-W type.

(3) Safety relief device. A "safety relief device" means a device intended to prevent rupture of a container under certain conditions of exposure.

(4) Safety relief valve. A "safety relief valve" means a safety relief device containing an operating part that is held normally in a position closing the safety relief device channel by spring force and is intended to open and to close at predetermined pressures.

(5) Set pressure. The "set pressure" of a safety relief valve is the pressure marked on the valve and at which the valve is set to start-to-discharge.

(6) Start-to-discharge pressure. The "start-to-discharge pressure" of a safety relief valve is the pressure at which the first bubble appears through a water seal of not over 4 inches on the outlet of the valve.

NOTE: When the nature of the service requires the use of a metal-to-metal seat safety relief, valve, with or without secondary sealing means, the start-to-discharge pressure may be considered the pressure at which an audible discharge occurs.

(7) Resealing pressure. The "resealing pressure" of a safety relief valve is the pressure at which leakage ceases through a water seal of not over 4 inches on the outlet of the valve.

(8) Flow capacity. The "flow capacity" of a safety relief device is the capacity in cubic feet per minute of free air discharged at the required flow rating pressure.

(9) Flow rating pressure. The "flow rating pressure" means the pressure at which a safety relief device is rated for capacity.

(10) Free air or free gas. "Free air" or "free gas" means air or gas measured at a pressure of 14.7 pounds per square inch absolute and a temperature of 60°F.

(11) Frangible disc. A "frangible disc" means a safety relief device in the form of a disc, usually of metal, which is so held as to close the safety relief device channel under normal conditions. The disc is intended to burst at a predetermined pressure to permit the escape of gas.

(12) Fusible plug. A "fusible plug" means a safety relief device in the form of a plug of suitable low-melting material, usually a metal alloy, which closes the safety relief device channel under normal conditions and is intended to yield or melt at a predetermined temperature to permit the escape of gas.

(13) DOT Design pressure. The "DOT design pressure" is identical to the term "maximum allowable working pressure" as used in the "Code" and is the maximum gage pressure at the top of the tank in its operating position. To determine the minimum permissible thickness of physical characteristics of the different parts of the vessel, the static head of the lading shall be added to the DOT design pressure to determine the thickness of any specific part of the vessel. If vacuum insulation is used, the liquid container shall be designed for a pressure of 15 p.s.i. more than DOT design pressure, plus static head of the lading.

EXCEPTION: For containers constructed in accordance with paragraph U-68 or U-69 of section VIII of the ASME Boiler and Pressure Vessel Code, 1949 Edition, the maximum allowable working pressure for the purpose of these standards is considered to be 125 percent of the design pressure as provided in 49 CFR 173.315 of DOT Regulations.

(14) Code. "Code" is defined as paragraph U-68, U-69, U-200, or U-201 of section VIII of the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers, 1949 Edition, or section VIII of the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers, 1950, 1952, 1956, 1959, and 1962 Editions; or the Code for Unfired Pressure Vessels for Petroleum Liquids and Gases of the American Petroleum Institute and the American Society of Mechanical Engineers (API-ASME), 1951 Edition.

(15) DOT regulations. The "DOT regulations" refers to Department of Transportation Regulations for Transportation of Explosives and Other Dangerous Articles by Land and Water in Rail Freight, Express and Baggage Services and by Motor Vehicle (Highway) and Water,

including Specifications for Shipping Containers, Code of Federal Regulations, Title 49, Parts 171 to 178. [Order 73-5, § 296-24-93501, filed 5/9/73 and Order 73-4, § 296-24-93501, filed 5/7/73.]

WAC 296-24-93503 General requirements. (1) Application. See WAC 296-24-93003(1).

(2) Specifications and Tests. All safety relief devices covered by these standards shall meet the design, construction, marking, and test specifications of the "Compressed Gas Association Safety Relief Device Standards Part 2-Cargo and Portable Tanks for Compressed Gases: S-1.2-1963."

(3) Specific Requirements for Safety Relief Devices.

(a) Each container shall be provided with one or more safety relief devices which, unless otherwise specified, shall be safety relief valves of the spring-loaded type.

(b) Safety relief valves shall be set to start-to-discharge at a pressure not in excess of 110 percent of the DOT design pressure of the container nor less than the DOT design pressure of the container except as follows:

(i) If an overdesigned container is used, the set pressure of the safety relief valve may be between the minimum required DOT design pressure for the lading and 110 percent of the DOT design pressure of the container used.

(ii) For sulfur dioxide containers, a minimum set pressure of 120 and 110 p.s.i.g. is permitted for the 150 and 125 p.s.i.g. DOT design pressure containers, respectively.

(iii) For carbon dioxide (refrigerated), nitrous oxide (refrigerated), and pressurized liquid argon, nitrogen and oxygen, there shall be no minimum set pressure.

(iv) For butadiene, inhibited, and liquefied petroleum gas containers, a minimum set pressure of 90 percent of the minimum design pressure permitted for these loadings may be used.

(v) For containers constructed in accord with paragraph U-68 or U-69 of the Code 1949 Edition, the set pressure marked on the safety relief valve may be 125 percent of the original DOT design pressure of the container.

(c) Only replacement parts or assemblies provided by the manufacturer of the device shall be used unless the suitability of interchange is proved by adequate tests.

(d) Safety relief valves shall have direct communication with the vapor space of the container.

(e) Any portion of liquid piping or hose which at any time may be closed at each end must be provided with a safety relief device to prevent excessive pressure.

(f) The additional restrictions of this subdivision apply to safety relief devices on containers for carbon dioxide or nitrous oxide which are shipped in refrigerated and insulated containers. The maximum operating pressure in the container may be regulated by the use of one or more pressure controlling devices, which devices shall not be in lieu of the safety relief valve required in WAC 296-24-93503(3)(a).

(g) All safety relief devices shall be so installed and located that the cooling effect of the contents will not prevent the effective operation of the device.

(h) In addition to the safety relief valves required by WAC 296-24-93503(3)(a) each container for carbon dioxide may be equipped with one or more frangible disc safety relief devices of suitable design set to function at a pressure not exceeding two times the DOT design pressure of the container.

(i) Subject to conditions of 49 CFR 173.315(a)(1) (DOT Regulations) for methyl chloride and sulfur dioxide optional portable tanks of 225 p.s.i.g. minimum DOT design pressure, one or more fusible plugs approved by the Bureau of Explosives, 63 Vesey street, New York, NY 10007, may be used in lieu of safety relief valves of the spring-loaded type. If the container is over 30 inches long a safety relief device having the total required flow capacity must be at both ends.

(j) When storage containers for liquefied petroleum gas are permitted to be shipped in accordance with 49 CFR 173.315(j) (DOT Regulations), they must be equipped with safety relief devices in compliance with the requirements for safety relief devices on above-ground containers as specified in the National Fire Protection Association Pamphlet No. 58-1969 "Standard for the Storage and Handling of Liquefied Petroleum Gases."

(k) When containers are filled by pumping equipment which has a discharge capacity in excess of the capacity of the container safety relief devices, and which is capable of producing pressures in excess of DOT design pressure of the container, precautions should be taken to prevent the development of pressures in the container in excess of 120 percent of its DOT design pressure. This may be done by providing additional capacity of the safety relief valves on the container, by providing a bypass on the pump discharge, or by any other suitable method.

(l) This additional requirement applies to safety relief devices on containers for liquefied hydrogen and pressurized liquid argon, nitrogen, and oxygen. The liquid container shall be protected by one or more safety relief valves and one or more frangible discs.

(m) Safety relief devices shall be arranged to discharge unobstructed to the open air in such a manner as to prevent any impingement of escaping gas upon the container. Safety relief devices shall be arranged to discharge upward except this is not required for carbon dioxide, nitrous oxide and pressurized liquid argon, nitrogen, and oxygen.

(n) No shutoff valves shall be installed between the safety relief devices and the container except, in cases where two or more safety relief devices are installed on the same container, a shutoff valve may be used where the arrangement of the shutoff valve or valves is such as always to insure full required capacity flow through at least one safety relief device.

(4) Maintenance Requirements for Safety Relief Devices. (a) Care shall be exercised to avoid damage to safety relief devices. Care shall also be exercised to avoid plugging by paint or other dirt accumulation of safety relief device channels or other parts which could interfere with the functioning of the device.

(b) Only qualified personnel shall be allowed to service safety relief devices. Any servicing or repairs which

require resetting of safety relief valves shall be done only by or after consultation with the valve manufacturer.

(c) Safety relief devices periodically shall be examined externally for corrosion damage, plugging of external safety relief device channels, and mechanical defects such as leakage or extrusion of fusible metal. Valves equipped with secondary resilient seals shall have the seals inspected periodically. If there is any doubt regarding the suitability of the safety relief device for service the container shall not be filled until it is equipped with a suitable safety relief device. [Order 73-5, § 296-24-93503, filed 5/9/73 and Order 73-4, § 296-24-93503, filed 5/7/73.]

WAC 296-24-940 Air receivers. [Order 73-5, § 296-24-940, filed 5/9/73 and Order 73-4, § 296-24-940, filed 5/7/73.]

WAC 296-24-94001 General requirements. (1) Application. These standards apply to compressed air receivers, and other equipment used in providing and utilizing compressed air for performing operations such as cleaning, drilling, hoisting, and chipping. On the other hand, however, this section does not deal with the special problems created by using compressed air to convey materials nor the problems created when men work in compressed air as in tunnels and caissons. These standards are not intended to apply to compressed air machinery and equipment used on transportation vehicles such as steam railroad cars, electric railway cars, and automotive equipment.

(2) New and Existing Equipment. (a) All new air receivers installed after the effective date of these standards shall be constructed in accordance with the 1968 Edition of the A.S.M.E. Boiler and Pressure Vessel Code, section VIII.

(b) All safety valves used shall be constructed, installed, and maintained in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, section VIII edition 1968. [Order 73-5, § 296-24-94001, filed 5/9/73 and Order 73-4, § 296-24-94001, filed 5/7/73.]

WAC 296-24-94003 Installation and equipment requirements. (1) Installation. Air receivers shall be so installed that all drains, handholes, and manholes therein are easily accessible. Air receivers should be supported with sufficient clearance to permit a complete external inspection and to avoid corrosion of external surfaces. Under no circumstances shall an air receiver be buried underground or located in an inaccessible place. The receiver should be located as close to the compressor or after-cooler as is possible in order to keep the discharge pipe short.

(2) Drains and Traps. A drain pipe and valve shall be installed at the lowest point of every air receiver to provide for the removal of accumulated oil and water. Adequate automatic traps may be installed in addition to drain valves. The drain valve on the air receiver shall be opened and the receiver completely drained frequently and at such intervals as to prevent the accumulation of excessive amounts of liquid in the receiver.

(3) Gages and Valves. (a) Every air receiver shall be equipped with an indicating pressure gage (so located as to be readily visible) and with one or more spring-loaded safety valves. The total relieving capacity of such safety valves shall be such as to prevent pressure in the receiver from exceeding the maximum allowable working pressure of the receiver by more than 10 percent.

(b) No valve of any type shall be placed between the air receiver and its safety valve or valves.

(c) Safety appliances, such as safety valves, indicating devices and controlling devices, shall be constructed, located, and installed so that they cannot be readily rendered inoperative by any means, including the elements.

(d) All safety valves shall be tested frequently and at regular intervals to determine whether they are in good operating condition. [Order 73-5, § 296-24-94003, filed 5/9/73 and Order 73-4, § 296-24-94003, filed 5/7/73.]

Part L ELECTRICAL

WAC

296-24-950 Electrical—Application.
296-24-955 National electrical code.

WAC 296-24-950 Electrical—Application. (1) General. WAC 296-24-955 adopts the National Electrical Code NFPA 70-1971; ANSI C 1-1971 (Rev. of 1968), which is incorporated by reference in WAC 296-24-950 and WAC 296-24-955.

(2) Purpose of the National Electrical Code. (a) The purpose of the National Electrical Code is the practical safeguarding of any persons and of buildings and their contents from hazards arising from the use of electricity for light, heat, power, radio, signaling, and for other purposes. The standards contained therein are occupational safety and health standards to the extent that they safeguard any person who is an employee of an employer.

(b) The National Electrical Code contains basic minimum provisions considered necessary for safety.

(3) Scope. (a) Covered. The provisions of WAC 296-24-950 and WAC 296-24-955 cover electrical installations and utilization equipment installed or used within or on public and private buildings, structures and other premises including:

- (i) Yards,
- (ii) Carnivals,
- (iii) Parking lots,
- (iv) Mobile homes,
- (v) Recreational vehicles,
- (vi) Conductors that connect an installation to a supply of electricity, and
- (vii) Other outside conductors adjacent to the premises.

(b) Not covered. The provisions of this part do not cover:

- (i) Installations in ships, watercraft, railway rolling stock, aircraft or automotive vehicles,
- (ii) Installations underground in mines,

(iii) Installations of railways for generation, transformation, transmission, or distribution of power used exclusively for operation of rolling stock or installations used exclusively for signaling and communication purposes.

(iv) Installations of communication equipment under exclusive control of communication utilities, located outdoors or in building spaces used exclusively for such installation, or

(v) Installations under the exclusive control of electric utilities for the purpose of communication, metering or for the generation, control, transformation, transmission, and distribution of electric energy, located in buildings used exclusively by the utilities for such purposes or located outdoors on property owned or leased by the utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(4) Definitions applicable to WAC 296-24-950 and WAC 296-24-955. (a) Approved. Some provisions of the National Electrical Code, NFPA 70-1971; ANSI C 1-1971 (Rev. of 1968), which is adopted in WAC 296-24-950 and WAC 296-24-955, require installations or equipment to be approved. In Article 100 of the Code, "approved" is defined to mean "acceptable to the authority enforcing this Code." The authority enforcing the Code under WAC 296-24-950 and WAC 296-24-955 is the Director of the Department of Labor and Industries. The definitions in this section indicate what is acceptable to the Director of the Department of Labor and Industries, and therefore approved within the meaning of the Code as incorporated in WAC 296-24-950 and WAC 296-24-955.

(b) Acceptable. An installation or equipment is acceptable to the Director of the Department of Labor and Industries, and approved within the meaning of WAC 296-24-950 and WAC 296-24-955: (i) If it is accepted, or certified, or listed, or labeled, or otherwise determined to be safe by a nationally recognized testing laboratory, such as, but not limited to, Underwriters' Laboratories, Inc. and Factory Mutual Engineering corp.; or (ii) with respect to an installation or equipment of a kind which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, if it is inspected or tested by another Federal agency, or by a State, municipal, or other local authority responsible for enforcing occupational safety provisions of the National Electrical Code, and found in compliance with the provisions of the National Electrical Code as applied in WAC 296-24-955; or (iii) 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 of the Department of Labor and Industries and his authorized representatives.

(c) For purposes of (4)(b) of this section:

(i) Listed. Equipment is "listed" if it is of a kind mentioned in a list which, (A) is published by a nationally recognized laboratory which makes periodic inspection of the production of such equipment, and (B) states

such equipment meets nationally recognized standards or has been tested and found safe for use in a specified manner;

(ii) Labeled. Equipment is "labeled" if there is attached to it a label, symbol, or other identifying mark of a nationally recognized testing laboratory which, (A) makes periodic inspections of the production of such equipment, and (B) whose labeling indicates compliance with nationally recognized standards or tests to determine safe use in a specified manner;

(iii) Accepted. An installation is "accepted" if it has been inspected and found by a nationally recognized testing laboratory to conform to specified plans or to procedures of applicable codes;

(iv) Certified. Equipment is "certified" if it, (A) has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner, or (B) is of a kind whose production is periodically inspected by a nationally recognized testing laboratory, and (C) it bears a label, tag, or other record of certification;

(v) Utilization equipment. Utilization equipment means equipment which utilizes electric energy for mechanical, chemical, heating, lighting, or similar useful purpose. [Order 74-27, § 296-24-950, filed 5/7/74.]

WAC 296-24-955 National electrical code. (1) The requirements contained in the following articles and sections of the National Electrical Code, NFPA 70-1971; ANSI C 1-1971 (Rev. of 1968) shall apply to all electrical installations and utilization equipment:

Articles:

500 _____	Hazardous Locations.
501 _____	Class I Installations (Hazardous Locations).
502 _____	Class II Installations (Hazardous Locations).
503 _____	Class III Installations (Hazardous Locations).

Sections:

250-58 (a) and (b) _____	Equipment on Structural Metal.
250-59 (a), (b), and (c) _____	Portable and/or Cord Connected and Plug Connected Equipment, Grounding Method.
400-3 (a) and (b) _____	Flexible Cords and Cable, Uses.
400-4 _____	Flexible Cords and Cable Prohibited.
400-5 _____	Flexible Cords and Cables, Splices.
400-9 _____	Overcurrent Protection and Ampacities of Flexible Cords.
400-10 _____	Pull at Joints and Terminals of Flexible Cords and Cables.

Sections:

- 422-8 _____ Installation of Appliances with Flexible Cords.
- 422-9 _____ Installation of Portable Immersion Heaters.
- 422-10 _____ Installation Appliances Adjacent to Combustible Material.
- 422-11 _____ Stands for Portable Appliances.
- 422-12 _____ Signals for Heated Appliances.
- 422-14 _____ Water Heaters.
- 422-15 (a), (b), and (c). _____ Installation of Infrared Lamp and Industrial Heating Appliances. Electric Connection.
- 110-14 (a) and (b) _____ Grounding Live Part.
- 110-17 (a), (b), and (c) _____ Arcing Parts.
- 110-18 _____ Marking.
- 110-21 _____ Identification.
- 110-22 _____
- 240-16 (a), (b), (c), and (d) _____ Location in Premises for Overcurrent Protection Devices.
- 240-19 (a) and (b) _____ Guarding of Arcing or Suddenly Moving Parts of Overcurrent Protection Devices.
- 250-3 (a) and (b) _____ D.C. System Grounding.
- 250-5 (a), (b), and (c) _____ A.C. Circuits and Systems To Be Grounded.
- 250-7 _____ Circuits Not To Be Grounded.
- 250-42 (a), (b), (c), and (d) _____ Fixed Equipment Grounding, General.
- 250-43 (a), (b), (c), (d), (e), (f), (g), (h), and (i). _____ Fixed Equipment Grounding.
- 250-44 (a), (b), (c), (d), and (e) _____ Nonelectrical Equipment, Grounding.
- 250-45 (a), (b), (c), and (d) _____ Equipment Connected by Cord and Plug, Grounding.
- 430-142 (a), (b), (c), and (d) _____ Stationary Motor, Grounding.
- 430-143 _____ Portable Motors, Grounding.
- 250-50 (a) and (b) _____ Equipment Grounding Connections.
- 250-51 _____ Effective Grounding.
- 250-57 (a) and (b) _____ Fixed Equipment Method of Grounding.
- 422-16 _____ Appliance Grounding.
- 422-17 _____ Installation of Wall-

Sections:

mounted Ovens and Counter-mounted Cooking Units.

(2) Every new electrical installation and all new utilization equipment installed after June 7, 1974, and every replacement, modification, or repair or rehabilitation, after June 7, 1974, of any part of any electrical installation or utilization equipment installed before June 7, 1974, shall be installed or made, and maintained, in accordance with the provisions of the 1971 National Electrical Code, NFPA 70-1971; ANSI C 1-1971 (Rev. of 1968).

(3) Ground-fault protection. (a) General. Notwithstanding any other provision of this section, the requirement in section 210-7 of the 1971 National Electric Code (NFPA 70-1971; ANSI C1-1971) that all 15- and 20-ampere receptacle outlets on single-phase circuits for construction sites have approved ground-fault circuit protection for personnel does not apply. In lieu thereof, the employer shall use either ground-fault circuit interrupters as specified in subsection (3)(b) of this section or an assured equipment grounding conductor program as specified in subsection (3)(c) of this section, to protect employees on construction sites. These requirements are in addition to any other requirements for equipment grounding conductors.

(b) Ground-fault circuit interrupters. All 120-volt, single-phase, 15- 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.

(c) 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 permanent wiring 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:

(i) 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.

(ii) The employer shall designate one or more competent persons (as defined in WAC 296-24-012(3)) to implement the program.

(iii) 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 indication of possible internal damage. Equipment

found damaged or defective may not be used until repaired.

(iv) 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- and plug-connected equipment required to be grounded:

(A) All equipment grounding conductors shall be tested for continuity and shall be electrically continuous.

(B) 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.

(v) All required tests shall be performed:

(A) Before first use;

(B) Before equipment is returned to service following any repairs;

(C) 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

(D) 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.

(vi) The employer may not make available or permit the use by employees of any equipment which has not met the requirements of subsection (3)(c) of this section.

(vii) Tests performed as required in this subsection shall be recorded. This test record shall identify each receptacle, cord set, and cord- 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. [Order 77-12, § 296-24-955, filed 7/11/77; Order 74-27, § 296-24-955, filed 5/7/74.]

Chapter 296-27 WAC

RECORDING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-27-200 Posting of notice, availability of act regulations and applicable standards. [Order 74-22, § 296-27-200, filed 5/6/74.] Repealed by Order 75-14, filed 4/14/75. See WAC 296-350-400.

WAC 296-27-010 Purpose and scope. The regulations of this chapter implement sections RCW 49.17.050(5), RCW 49.17.220(1), RCW 49.17.220(2), RCW 49.17.230, and RCW 49.17.260 of the Washington Industrial Safety and Health Act of 1973. These sections provide for record keeping and reporting by all employers covered under the Act as necessary or appropriate for enforcement of the Act, for developing information regarding the causes and prevention of occupational accidents and illnesses, and for maintaining a program of collection, compilation, and analysis of industrial safety and health statistics.

Pursuant to the provisions of 29 CFR 1904.10, Records maintained by an employer and reports submitted pursuant to, and in accordance with the requirements of an approved State Plan under section 18 of the Federal Occupational Safety and Health Act of 1970 (Public Law 91-596, 84 STAT. 1590) shall be regarded as compliance with 29 CFR Part 1904 - "Recording and Reporting Occupational Injuries and Illnesses".

Compliance with and requirements of this chapter, as recognized by the Washington Industrial Safety and Health State Plan, is regarded as compliance with the provisions of the above-cited Federal requirements. Employers complying with the record keeping and reporting requirements of this chapter are not required to keep records as required by the Federal Record Keeping and Reporting Regulations (Ref. 29 CFR 1904.10).

The record keeping and reporting requirements of this chapter are separate and distinct from the record keeping and reporting requirements under Title 51 Revised Code of Washington (the Industrial Insurance Act) unless otherwise noted in this chapter. [Order 74-22, § 296-27-010, filed 5/6/74.]

WAC 296-27-020 Definitions. (1) "Act" means the Washington Industrial Safety and Health Act of 1973, chapter 49.17 RCW, as now or hereafter amended.

(2) The definitions and interpretations included in RCW 49.17.020 shall be applicable to such terms when used in this chapter, unless a different interpretation is clearly required by the context.

(3) "Recordable occupational injuries or illnesses of employees" means any occupational injury or illness of employees which result in:

(a) Occupational fatalities, regardless of the length of time between injury and death, or the length of the illness preceding the time of death (no recording is required for fatalities occurring after a termination of employment, except when recording may otherwise be required by a specific industrial safety and health standard adopted pursuant to the Act); or

(b) Lost workday cases, other than fatalities, that result in lost workdays (see subsection (6) of this section); or

(c) Occupational illnesses, or nonfatal cases without lost workdays which result in transfer to another job or termination of employment, or require medical treatment (other than first aid) or involve loss of consciousness or restriction of work or motion. This category also includes any diagnosed occupational illnesses which are reported to the employer but are not classified as fatalities or lost workday cases.

(4) "Medical treatment" means and includes treatment administered by a physician or by registered professional personnel under the standing orders of a physician. Medical treatment does not include first aid treatment even though provided by a physician or registered professional personnel.

(5) "First Aid" means any one-time treatment, and any follow-up visit or visits for the purpose of observation of minor scratches, cuts, burns, splinters and so forth which do not ordinarily require professional medical care. Such one-time treatment and follow-up visit or visits for the purpose of observation are considered first aid even though provided by a physician or registered professional personnel.

(6) "Lost workdays":

(a) "Lost workdays - days away from work" means the number of days (consecutive or not) after the day of injury or illness which the employee would have worked but could not because of occupational injury or illness. The number of "lost workdays - days away from work", should not include the day of the injury, or the day the illness occurred, or any days which the employee was not scheduled to work; e.g. Saturday, Sunday, or holidays.

(b) "Lost workdays - days of restricted activity" means the number of workdays (consecutive or not) on which, because of the injury or illness:

(i) The employee was assigned to a temporary job; or

(ii) The employee worked at a permanent job less than full time; or

(iii) The employee worked at a permanently assigned job but could not perform all the duties normally assigned to that job.

The number of "lost workdays - days of restricted activity" should not include the day of the injury or the day the illness occurred, or any other days which the employee was not scheduled to work; e.g. Saturday, Sunday, or holidays, etc.

(7) "Establishment" means:

(a) A single physical location where business is conducted or where services or industrial operations are performed. (For example: a factory, mill, store, hotel, restaurant, movie theater, farm, ranch, bank, sales office, warehouse, or central administrative office.) Where distinctly separate activities are performed at a single physical location, such as contract construction activities operated from the same physical location as a lumber yard, each activity shall be treated as a separate establishment.

(b) For firms engaged in activities such as agriculture, construction, transportation, communications, electric, gas or sanitary services, which may be physically disbursed, "establishment" means a place to which employees report each day.

(c) For employees who do not primarily report or work at a single establishment, and who are generally not supervised in their daily work, such as travelling salesmen, technicians, engineers, etc., "establishment" means the location from which they are paid, or the base from which employees operate to carry out their activities.

(8) "WISHERS" means Washington Industrial Safety and Health Evaluation and Reporting System.

(9) "Occupational illness" means such illness as arises naturally and approximately out of employment under the provisions of the Act.

NOTE: Examples of occupational illnesses appear on the instruction page of Form WISHERS #100.

(10) "Occupational" means industrial and industrial means occupational. [Order 74-22, § 296-27-020, filed 5/6/74.]

WAC 296-27-030 Log of occupational injuries and illnesses. (1) Except as provided in subsection (2) of this section, each employer subject to the Act shall:

(a) Maintain in each establishment a log of all recordable occupational injuries and illnesses for that establishment; and

(b) Enter each recordable injury and illness on the log as early as practicable, but no later than six working days after receiving information that a recordable case has occurred. For this purpose Form WISHERS No. 100 or an equivalent which is as readable and comprehensible to a person not familiar with it shall be used. The log shall be completed in the detail provided in instructions of Form WISHERS No. 100, a facsimile of which appears as Appendix 1 of this chapter.

(2) Any employer may maintain the log of all recordable occupational injuries and illnesses at a place other than the establishment or by means of data processing equipment, or both, if at each of the employer's establishments there is available a copy of the log which reflects separately the injury and illness experience of that establishment complete and current to a date within 45 calendar days. [Order 74-22, § 296-27-030, filed 5/6/74.]

WAC 296-27-040 Period covered by logs. Logs of occupational injuries and illnesses shall be established on a calendar year basis. The initial log shall include recordable occupational injuries and illnesses occurring on or after January 1, 1975. [Order 74-22, § 296-27-040, filed 5/6/74.]

WAC 296-27-050 Supplementary record. In addition to the log of occupational injuries and illnesses provided for under WAC 296-27-030, each employer shall have available at each establishment or other location as specified in WAC 296-27-020 within six working days after receiving information that a recordable case has occurred, a supplementary record for each occupational injury or illness for that establishment. The record shall be completed in the detail prescribed in the instructions accompanying Form WISHERS No. 101, a facsimile of

which appears as Appendix 2 of this chapter. The Department of Labor and Industries ACCIDENT REPORT FORM S-F 1537 (revised 12-72) may be used as an alternative to the Form WISHERS 101. Other reports are acceptable alternative records if they contain the information required by Form WISHERS No. 101. If no acceptable alternative record is maintained for other purposes, Form WISHERS No. 101 shall be used for the necessary information or shall be otherwise maintained in a convenient form. [Order 74-22, § 296-27-050, filed 5/6/74.]

WAC 296-27-060 Annual summary. (1) Each employer subject to the Act shall compile an annual summary of occupational injuries and illnesses for each establishment. Each annual summary shall be based on the information contained in the log of occupational injuries and illnesses for the particular establishment. Form WISHERS No. 102 shall be used for this purpose and shall be completed in the form and detail as provided in that form, a facsimile of which appears as Appendix 3 of this chapter.

(2) The summary shall be completed no later than one month after the close of each calendar year, beginning with the calendar year 1975.

(3) Each employer, or the officer or employee of the employer who supervises the preparation of the annual summary of occupational injuries and illnesses, shall certify that the annual summary of occupational injuries and illnesses is true and complete. The certification shall be accomplished by affixing the signature of the employer or the officer or employee of the employer who supervises the preparation of the annual summary of occupational injuries and illnesses to the lower right-hand corner of the annual summary, or by appending a separate statement to the annual summary, certifying that the annual summary is true and complete.

(4) (a) Each employer shall post a copy of the establishment's annual summary in each establishment. The summary covering the previous calendar year shall be posted no later than February 1, and shall remain in place until March 1. For employees who do not primarily report or work at a single establishment, or who do not report to any fixed establishment on a regular basis, employer, shall satisfy these posting requirements by presenting or mailing a copy of the summary during the month of February of the following year to each such employee who receives pay during that month. For multi-establishment employers where operations have closed down in some establishments during the calendar year, it will not be necessary to post summaries for those establishments.

(b) A failure to post a copy of the establishment's annual summary, or otherwise satisfy the posting requirements as specified in this section, may result in the issuance of citations and assessments of penalties pursuant to RCW 49.17.120 and RCW 49.17.180. [Order 74-22, § 296-27-060, filed 5/6/74.]

WAC 296-27-070 Retention of records. Records provided for in WAC 296-27-030, WAC 296-27-050,

and WAC 296-27-060, shall be retained in each establishment for five years following the end of the year to which they relate. [Order 74-22, § 296-27-070, filed 5/6/74.]

WAC 296-27-075 Employees not in fixed establishments. Employers of employees engaged in physically dispersed operations, such as occur in construction, installation, repair or service activities, who do not report to any fixed establishment on a regular basis, but are subject to common supervision, may satisfy the provisions of WAC 296-27-030, WAC 296-27-050, and WAC 296-27-070, with respect to such employees by:

(1) Maintaining the required records for each operation, or group of operations which is subject to common supervision (field superintendent, field supervisor, etc.) in an established central place;

(2) Having the address and telephone number of the central place available at each worksite; and

(3) Having personnel available at the central place during normal business hours to provide information from the records maintained there by telephone or mail. [Order 74-22, § 296-27-075, filed 5/6/74.]

WAC 296-27-080 Access to records. (1) Each employer shall provide upon request records provided for in WAC 296-27-030, WAC 296-27-050, and WAC 296-27-060, for inspection and copying by designated or authorized representatives of the Department of Labor and Industries, compliance safety and health officers of the Occupational Safety and Health Administration, U.S. Department of Labor during any occupational safety and health inspection provided for under 29 CFR 1903 and section 8 of the Federal Occupational Safety and Health Act, by any representatives of the Bureau of Labor Statistics, U.S. Department of Labor, or by any representative of the Secretary of Health, Education and Welfare during any investigation under section 20(b) of the Federal Occupational Safety and Health Act.

(2) (a) The log of occupational injuries and illnesses provided for in WAC 296-27-030, shall be available in the establishment for examination in a reasonable manner and at reasonable times by any authorized representatives of the employees. For purposes of this section, an authorized representative of the employee shall be defined as (i) a representative for purposes of collective bargaining; or (ii) an employee of the employer who has written authorization from two or more employees employed in the establishment; or (iii) where three or fewer employees are employed in the work place, any one of such employees.

(b) The employer shall withhold from examination the injury and illness records of an employee under subsection (2)(a)(i) of this section if the employee has so requested in writing. The employer shall maintain a separate file of employee requests for such withholding. The file is to be made available for inspection and copying as provided in subsection (1) of this section.

(c) Nothing in this section shall be deemed to effect in any way any collective bargaining agreement in effect prior to the effective date of this chapter, nor shall it be

deemed to effect in any way the scope of collective bargaining as to safety and health matters. [Order 74-22, § 296-27-080, filed 5/6/74.]

WAC 296-27-090 Reporting of fatality or multiple hospitalization accidents. (1) Within twenty-four hours after the occurrence of an employment accident which results in an immediate or probable fatality to one or more employees, or which results in 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.

(2) Equipment involved in an accident resulting in an immediate fatality shall not be moved until a representative of the Division of Industrial Safety and Health investigates the accident and authorizes removal of such equipment, when removal of such equipment is necessary in order to prevent further accident or to remove the victim, such equipment may be moved as required. [Order 74-22, § 296-27-090, filed 5/6/74.]

WAC 296-27-100 Falsification, failure to keep records or reports. (1) RCW 49.17.190(2) of the Act provides that "whoever knowingly makes any false statement, representation, or certification in any application, record, report, plan or other document filed or required to be maintained pursuant to this chapter shall, upon conviction, be guilty of a gross misdemeanor and be punished by a fine of not more than \$10,000, or by imprisonment of not more than six months, or by both".

(2) Failure to maintain records or file reports required by this chapter, or in the detail required by the forms and instructions issued under this chapter, may result in the issuance of citations and assessment of penalties as provided for in RCW 49.17.120, 49.17.140, 49.17.180, or 49.17.190. [Order 74-22, § 296-27-100, filed 5/6/74.]

WAC 296-27-110 Change of ownership. Where an establishment has changed ownership, the employer shall be responsible for maintaining records and filing reports only for that period of the year during which he owned such establishment. However, in the case of any change of ownership, the employer shall preserve those records, if any, of the prior ownership which are required to be kept under this chapter. These records shall be retained at each establishment to which they relate, for the period, or the remainder thereof, required under WAC 296-27-070. [Order 74-22, § 296-27-110, filed 5/6/74.]

WAC 296-27-120 Petitions for record keeping exceptions. (1) In order to achieve a uniform, national system for the record keeping and reporting of occupational injuries and illnesses, the State of Washington and the United States Department of Labor have agreed that as

applied to employers as defined by subsection 3(5) of the Occupational Safety and Health Act of 1970 (Public Law 91-596, 81 STAT 1950) the state shall not grant any variances or exceptions to the record keeping and reporting regulations of this chapter, with the exception of approval of forms to serve as the substitutes for WISHERS forms number 100 and 101 (see WAC 296-27-030 and WAC 296-27-050), without prior approval of the Bureau of Labor Statistics.

(2) All petitions for authorization to maintain records in a manner different than that required by this chapter shall be submitted to the director or directly to the Bureau of Labor Statistics. The director, upon receipt of a petition submitted pursuant to the provisions of subsection (3) of this section, shall immediately forward copies of same to appropriate officials of the Bureau of Labor Statistics. Should said federal officials inform the director of their belief in the desirability or necessity of additional notice or conferences pursuant to provisions of subsection (7) of this section, the director shall provide or cause to be provided such additional notice and/or afford an opportunity for interested parties for informal conferences or hearings concerning the petition. For the purposes of this section, the Occupational Safety and Health Administration and the Bureau of Labor Statistics shall be considered interested parties.

The Bureau of Labor Statistics shall be afforded the opportunity to review the petition and any comments submitted in regard thereto. The director shall not grant the petition prior to a finding by the said federal agency that the alternative procedure proposed will not hamper or interfere with the purposes of the Occupational Safety and Health Act of 1970.

(3) Submission of Petition. Any employer, who for good cause wishes to maintain records in a manner different from that required by this chapter, may submit a petition containing the information specified in subsection (5) of this section to the director.

(4) Opportunity for Comment. Affected employees, or their representatives shall have an opportunity to submit written data, views, or arguments concerning the petition to the director within ten working days following the receipt of notice under subdivision (5)(e) of this section.

(5) Contents of Petition. A petition filed under subsection (3) of this section shall include:

- (a) The name and address of the applicant;
- (b) The address of the place or places (establishment or establishments) of the employment involved;
- (c) Specifications of the reasons for seeking relief;
- (d) A description of the different record keeping procedures which are proposed by the applicant;
- (e) A statement that:

(i) The applicant has informed his affected employees of the petition by giving a copy thereof to them or to their authorized representative, posting a statement giving a summary of the petition and specifying where a copy of the petition may be obtained, at the place or places where notices to employees are normally posted, and by other appropriate means. A statement posted pursuant to these provisions shall be posted in each establishment identified in WAC 296-27-120(4)(b).

(ii) The applicant has in the same manner informed affected employees and their representatives of their rights under subsection (3) of this section.

(6) Additional Notice – Conferences.

(a) In addition to the actual notice provided for in subdivision (5)(e) of this section, the director may provide, or cause to be provided, such additional notice of the petition as he may deem appropriate.

(b) The director may also afford an opportunity to interested parties for informational conferences or hearings concerning the petition.

(7) After review of the petition, and any comments submitted in regard thereto, and upon completion of any necessary appropriate investigation concerning the petition, if the director finds that the alternative procedure proposed will not hamper or interfere with the purposes of the Act, and will provide equivalent information, he may grant the petition subject to such conditions as he may determine appropriate, subject to the provisions of WAC 296-200-120(2), and subject to revocation for cause.

(8) Publication. When any relief is granted to an applicant under this chapter, notice of such relief, and the reasons therefor, may be published in the Federal Register.

(9) Revocation. Whenever any relief under this section is sought to be revoked for any failure to comply with the conditions thereof, an opportunity for informal hearing or conference shall be afforded to the employers and affected employees, or their representatives, and other interested parties. Except in cases of willfulness or where public safety or health requires otherwise, before the commencement of any such informal proceeding, the employer shall:

(a) Be notified in writing of the facts of conduct which may warrant the action and,

(b) Be given an opportunity to demonstrate or achieve compliance.

(10) Compliance After Submission of Petitions. The submission of a petition or any delay by the director in acting upon a petition shall not relieve any employer from any obligation to comply with the provisions of this chapter.

(11) The director shall honor exceptions to the provisions of 29 CFR 1904 – RECORDING AND REPORTING OCCUPATIONAL INJURIES AND ILLNESSES, granted by the Bureau of Labor Statistics to companies having establishments in states other than Washington, when such exceptions apply to the establishments within this State.

(12) There shall be consultation between the appropriate representatives of the department, the Occupational Safety and Health Administration, and the Bureau of Labor Statistics in order to enjoy the effective implementation of this chapter. [Order 76-29, § 296-27-120, filed 9/30/76; Order 74-22, § 296-27-120, filed 5/6/74.]

WAC 296-27-121 Additional record keeping requirements. The director may require that additional records and reporting be kept and done in order to achieve

the purposes of the Act. [Order 76-29, § 296-27-121, filed 9/30/76.]

WAC 296-27-130 Description of statistical program. (1) RCW 49.17.260 directs the director to develop and maintain a program of collection, compilation and analysis of occupational safety and health statistics. The program shall include periodic surveys of occupational injuries and illnesses.

(2) The statistical program sample design encompasses probability procedures, detailed stratification by industry and size, and a systematic selection within the strata. Stratification and sampling will be carried out by the department. Some industries will be sampled more heavily than others depending on the injury rate level based on previous experience. The survey should produce adequate estimates for most four digit standard industrial classification (SIC) industries in manufacturing and for three digit (SIC) classification in non-manufacturing. [Order 74-22, § 296-27-130, filed 5/6/74.]

WAC 296-27-140 Duties of employers—Statistical program. Upon receipt of an Occupational Injuries and Illnesses Survey Form, Form WISHERS No. 103, the employer shall promptly complete the form in accordance with the instructions contained therein and return it in accordance with the aforesaid instructions. A facsimile of the Form WISHERS No. 103 and the instructions pertinent to that form appear as Appendix 4 at the end of this chapter. [Order 74-22, § 296-27-140, filed 5/6/74.]

WAC 296-27-150 Effective date of regulations. Pursuant to the finding of the director that additional time is needed to afford affected employers a reasonable opportunity to make changes in methods, means, or practices to meet the requirements of WAC 296-27-010 through WAC 296-27-140, the effective date of these requirements shall be January 1, 1975. [Order 74-22, § 296-27-150, filed 5/6/74.]

Chapter 296-28 WAC

CLEARANCE RULES—RAILROADS IN PRIVATE YARDS AND PLANTS

WAC

296-28-001	Forward.
296-28-005	Beginning of order.
296-28-010	Exemptions.
296-28-015	Definitions.
296-28-020	Overhead clearances.
296-28-025	Side clearances.
296-28-030	Track clearances.
296-28-035	Marking of cars.
296-28-040	Operation of excess dimension loads.
296-28-045	Narrow gauge railroads transporting freight cars.
296-28-050	Illustrations.

WAC 296-28-001 Foreword. These clearance rules and regulations for common carrier railroads are issued under and by the authority of RCW 81.44.010. Formerly, certain portions of these rules were by law administered by the department of labor and industries. In 1955 jurisdiction over matters treated by these rules was

placed in the Washington public service commission [now the Washington utilities and transportation commission] (RCW 43.53.055).

These rules and regulations are intended to prevent accidents which may result in either damage of equipment or injury to human beings. They are intended to protect the railroads and their employees and the general public. [Foreword, filed 4/3/61.]

Reviser's note: RCW 43.53.055 was repealed by § 80.98.040, chapter 14, Laws of 1961. Later enactment, see RCW 81.44.065.

WAC 296-28-005 Beginning of order. (1) Hearing was originally held in this cause at Seattle, Washington, on the 7th day of September, 1950, pursuant to notice duly given before representatives of both the Washington public service commission and the department of labor and industries.

(2) At the time of the original hearing the Washington public service commission was vested by law with jurisdiction over the safety of railroad passengers, while jurisdiction over the safety of railroad employees was in the department of labor and industries. In 1955, as stated in the foreword, jurisdiction over the safety of railroad employees was also placed in the Washington public service commission.

(3) In order to bring the clearance rules up to date and to delete the various references to the department of labor and industries so that confusion may be avoided, these amended rules are being published.

(4) All interested parties were represented at the original hearing and their appearances are listed in our original order in this cause dated and effective December 1, 1950.

(5) In pursuance of its rule-making power, the Washington public service commission hereby determines as follows:

(a) It is ordered that subsequent to December 1, 1950, in all construction and reconstruction of tracks or structures adjacent thereto, on all railroads over which freight cars are transported or proposed to be transported, the following minimum clearances shall be allowed.

(b) It is further ordered that a railroad company shall not operate freight cars, locomotives or other rolling equipment over tracks constructed subsequent to December 1, 1950, or tracks adjacent to buildings and structures constructed or reconstructed subsequent to that date, wherein the clearances are less than those prescribed in this order.

(c) It is further ordered that where specific authority has been issued for deviation from these clearances for construction occurring subsequent to December 1, 1950, but prior to the effective date of this order, authority so issued shall remain in effect.

(6) Overhead clearances authorized in this order are applicable to tracks on which freight cars having a height to running board of fifteen feet six inches or less are transported. In the case of cars or loads exceeding fifteen feet six inches, WAC 296-28-035 and 296-28-040 must be complied with.

(7) Side clearances authorized in this order are applicable to tracks on which freight cars having an overall

width not greater than ten feet ten inches are transported. In the case of cars or loads exceeding ten feet ten inches, WAC 296-28-035 and 296-28-040 must be complied with. [Opening paragraphs, filed 4/3/61.]

Reviser's note: As stated above, the control of safety of railroad employees is vested in the Washington public service commission (now named the Washington utilities and transportation commission). However, many nonrailroad enterprises have railroad tracks and some railroad equipment. To safeguard employees of these enterprises, the department of labor and industries adopted the same railroad clearance rules enacted by the public service commission and filed the same with the code reviser's office. The filing date appears in the bracketed history note at the end of each section.

WAC 296-28-010 Exemptions. (1) When the overhead or side clearances between a track and any building, structure or facility are less than the minimum prescribed in this order, but where lawfully created prior to the effective date thereof, the minimum clearances prescribed herein shall be provided whenever the building, structure or facility is relocated or reconstructed; however, the public service commission will consider specific requests for the future continuance of heretofore lawful clearances at such reconstructed building, structure or facility when application thereof has been made as provided in subsection (3) of this section.

(2) Where restricted clearances are necessary nothing herein shall be construed as preventing the movement of material over tracks when such material is necessary in the construction or maintenance of such tracks, nor in the movement of special work equipment used in the construction, maintenance or operation of the railroad, provided such movements shall be carried on under the conditions as are necessary to provide for the safety of all concerned; nor shall these rules be applicable, provided reasonable safety precautions are observed, during periods of actual emergency due to wrecks, derailments, washouts and like conditions.

(3) If in any particular case, exemption from any of the requirements herein is deemed necessary by the carrier concerned, the public service commission will consider the application of such carrier for such exemption when accompanied by a full statement of the conditions existing and the reason why such exemption is asked. Any exemption so granted will be limited to the particular case covered by the application.

(4) The public service commission reserves the right to modify any of the provisions of these regulations in specific cases, when, in its opinion, safety of railroad employees, public safety, convenience or necessity would be served by so doing.

(5) Logging railroads, or any operation directly incident to logging, now subject to the provisions of the Safety Standards for Logging Operations, published by the division of safety of the department of labor and industries of the state of Washington, are exempted from this order. [Exemptions section, filed 4/3/61.]

WAC 296-28-015 Definitions. (1) The overhead clearance is that distance measured along a line which is perpendicular to and joins a horizontal plane passing through the top of the highest rail and the lowest point of the overhead structure or obstruction.

(2) The side clearance is the shortest distance from centerline of track to a structure or obstruction at the side of the track.

(3) The track clearance is the shortest distance between the centerlines of adjacent tracks.

(4) Height of a freight car is the distance between the top of rail and the top of running board.

(5) Width of a freight car is twice the distance from the centerline of the car to the extreme outside part thereof.

(6) Icing platforms: The term "icing platform" shall include structures used in performing the service of icing, precooling, heating, ventilating and servicing of cars used in the handling of commodities requiring the above services.

(7) Constituted authority shall mean the public service commission.

(8) Overcrossing when used in this order means any point or place where a highway crosses a railroad by passing above the same. Clearances shall be as specified in WAC 296-28-020 (1) and (3).

(9) Undercrossing when used in this order means any point or place where a highway crosses a railroad by passing under the same. Existing laws pertaining to highways shall prevail. [Section 1, filed 4/3/61.]

WAC 296-28-020 Overhead clearances.

(1) Overhead clearance in general 22' 6"

(2) Overhead clearance in buildings 18' 0"

The overhead clearance inside of entirely enclosed buildings may be reduced to eighteen feet, provided that this clearance shall apply only to tracks terminating within the building, and further provided, that when an overhead clearance of less than twenty-two feet six inches is established therein, all cars, locomotives or other equipment shall be brought to a stop before entering such enclosed building, the conditions provided to require such stop to be approved by constituted authority.

Note: Engine houses and car shops are exempt from these regulations.

(3) Overhead clearance in tunnels and bridges.

Minimum overhead clearance in tunnels and through bridges may be decreased to the extent defined by the half-circumference of a circle having a radius of eight feet and tangent to a horizontal line twenty-two feet six inches above top of rail at a point directly above the centerline of track.

(4) Overhead clearance—all other structures.

Minimum overhead clearance as prescribed in subsection (1) above may be decreased to the extent defined by the half-circumference of a circle having a radius of eight feet six inches and tangent to a horizontal line twenty-two feet six inches above top of rail at a point directly over the centerline of track.

(5) Overhead clearance of wires.

All wires in general shall have a minimum vertical clearance of not less than that specified by the safety rules for the installation and maintenance by electric supply and communication lines as provided by the Rules for Electrical Construction and the Electrical and

Communication Workers Safety Rules of the state of Washington. [Section 2, filed 4/3/61.]

WAC 296-28-025 Side clearances.

(1) Side clearance in general 8' 6"

Note: To further reduce operational hazards, it is recommended that, wherever practicable, all posts, pipes, warning signs and other small obstructions be given a side clearance of ten feet.

(2) Side clearance at platforms:

(a) Platforms—8" or less above top of rail 4' 8"

(b) Platforms—4' 0" or less above top of rails 5' 9"

(c) Platforms—4' 6" or less above top of rail—when used principally for loading or unloading refrigerator cars 8' 0"

(d) Icing platforms and supports 5' 9"

(e) Platforms—Other than above 8' 6"

Note: Retractable platforms, either sliding or hinged, which are attached to a permanent structure shall be so designed that when not in use no part of such retractable platform shall fall within the clearance limits herein prescribed for a platform of that height above the top of the rail.

(f) Platforms—Combinations of any above.

Note: Platforms defined under subsection (2)(a) above may be combined with either subsection (2)(c) or subsection (2)(b) provided that the lower platform presents a level surface from a point not more than four feet eight inches from centerline of track to the face of the wall of the platform with which it is combined. No other combinations will be permitted.

(g) Platforms—Extension of existing platforms.

Note: Platforms which were constructed at lawful clearances prior to the effective date of this order may be extended at existing clearances upon approval of constituted authority.

(3) Side clearance—Bridges and tunnels 8' 0"

(4) Bridges and tunnels—Upper section (See WAC 296-28-020(3))

Side clearance in through bridges and tunnels may be decreased to the extent defined by the half circumference of a circle having a radius of eight feet and tangent to a horizontal line twenty-two feet six inches above top of rail directly above centerline of track.

(5) Bridges—Lower section and structures 4' high or less.

Through bridges supporting track affected, hand rails, water barrels and refuge platforms on bridges and trestles, water columns, oil columns, block signals, cattle guards and cattle chutes, or portions thereof, four feet or less above top of rail may have clearances decreased to the extent defined by a line extending diagonally upward from a point level with the top of rail and five feet distant laterally from centerline of track to a point four feet above top of rail and eight feet distant laterally from

centerline of track: *Provided*, That the minimum clearance for hand rails and water barrels shall be seven feet six inches and the minimum clearance for fences of cattle guards shall be six feet nine inches.

Note: Unless previously approved, the clearances authorized in this subsection, except as provided for hand rails and water barrels, are not permitted on through bridges where the work of trainmen or yardmen requires them to be upon the decks of such bridges for the purpose of coupling or uncoupling cars in the performance of switching service on a switching lead.

(6) Side clearance—Cattle guards and cattle chutes. (See subsection (5) above.)

(7) Side clearance—Engine house and car repair shop doors. 7' 6"

(8) Side clearance—Hand rails on bridges and trestles (see subsection (5)).

(9) Side clearance—Interlocking mechanism, switch boxes, etc. 3' 0"

Switch boxes, switch operating mechanism necessary for the control and operation of signals and interlockers projecting four inches or less above top of rail.

(10) Side clearance—Mail cranes and train order stands when not in operative position. 8' 6"

(11) Side clearance—Oil columns (see subsection (5)). 8' 0"

(12) Side clearance—Poles supporting trolley contact. 8' 3"

Conductors supplying motive power to track affected—of bracket construction.

(13) Side clearance—Poles other than trolley poles. 8' 6"

(14) Side clearance—Signals and switch stands 3' high or less when located between tracks where not practicable to provide clearances otherwise prescribed in this order 6' 0"

(15) Side clearance—Signals and switch stands other than above 8' 0"

(16) Side clearance—Tunnels (see subsection (4)). 8' 0"

(17) Side clearance—Water barrels on bridges (see subsection (5)).

(18) Side clearance—Water columns (see subsection (5)). 8' 0"

(19) Side clearances on curved track.

Note: Side clearances on all structures adjacent to curved track shall be increased as necessary to give the equivalent of tangent track clearances.

(20) Side clearances—Material or merchandise adjacent to tracks. 8' 6"

Note: No merchandise, material or other articles shall be placed or stored on ground or platforms adjacent to any track at a distance less than eight feet six inches from the centerline of track, except in cases of maintenance or emergency when such material is to be used within a reasonable period of time or where local conditions make

compliance with this note impossible.

[Section 3, filed 4/3/61.]

WAC 296-28-030 Track clearances.

(1) Track clearances—In general 14' 0"

The minimum distance between the centerlines of parallel standard gauge railroad tracks, which are used or proposed to be used for transporting cars, engines, motors or like equipment, shall be fourteen feet, except as hereinafter prescribed.

(2) Track clearances—Main and subsidiary tracks 15' 0"

The centerline of any standard gauge track, except a main track or a passing track, parallel and adjacent to a main track or a passing track, shall be at least fifteen feet from the centerline of such main track or passing track: *Provided, however*, That where a passing track is adjacent to and at least fifteen feet distant from the main track, any other track may be constructed adjacent to such passing track with clearance prescribed in subsection (1) above.

(3) Track clearances—Parallel team, house or industry tracks. 13' 0"

Minimum clearances between centerlines of parallel team, house or industry tracks shall be thirteen feet.

(4) Track clearances—Parallel ladder or ladder and other track 20' 0"

The centerline of any standard gauge ladder track, constructed parallel to any other track, shall have a clearance of not less than twenty feet from the centerline of such other track.

(5) Track clearances—Existing tracks

Note: Existing tracks may be extended at clearances lawfully prescribed prior to the effective date of this order.

[Section 4, filed 4/3/61.]

WAC 296-28-035 Marking of cars. (1) Cars exceeding 15' 6" in height.

Each car of a height exceeding fifteen feet six inches from top of rail to top of running board, the movement of which is hereby authorized, shall be marked, stenciled or placarded, and such markings maintained in a legible condition to read:

"This car
EXCESS
HEIGHT"

The words "EXCESS HEIGHT" to occupy the greater portion of a rectangular space 7" x 10" enclosed within a 3/4" solid border. The markings required shall be made permanent on owned cars as soon as practicable. Lettering and border of signs shall be of colors contrasting to that of the car body. All such required marking and placarding shall be placed on the side adjacent to the ladder or handholds near the floor line of the car at each of the four corners.

(2) Cars exceeding 10' 10" in width.

Each car of a width exceeding ten feet ten inches, the movement of which is hereby authorized, shall be

marked, stenciled or placarded, and such markings maintained in a legible condition to read:

"This car
EXCESS
WIDTH"

The words "EXCESS WIDTH" to occupy the greater portion of a rectangular space 7" x 10" enclosed within 3/4" solid border. The markings required shall be made permanent on owned cars as soon as practicable. Lettering and border of signs shall be of colors contrasting to that of the car body. All such required marking and placarding shall be placed on the side adjacent to the ladder or handholds near the floor line of the car at each of the four corners. [Section 5, filed 4/3/61.]

WAC 296-28-040 Operation of excess dimension loads. (1) Cars containing lading in excess of 15' 6" high and/or 5' 5" from centerline of car.

Each open top car containing lading of a height exceeding fifteen feet six inches above top of rail, or which extends laterally more than five feet five inches from the centerline of the car, the movement of which is hereby authorized, shall be marked, stenciled or placarded, and such markings maintained in a legible condition to read:

"This car EXCESS HEIGHT"	or	"This car EXCESS WIDTH"
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The words "EXCESS HEIGHT" or "EXCESS WIDTH" to occupy the greater portion of a space 7" x 10" enclosed within a 3/4" solid border. Letters and border to be of contrasting colors. All such required markings and placarding shall be placed on the side adjacent to the ladder or handholds near the floor line of the car at each of the four corners where practicable, and in addition one each of such signs shall be placed on each side of the load in a conspicuous position.

(2) Cars containing lading which extends laterally in excess of 5' 5".

The movement of open top cars containing lading which extends laterally in excess of five feet five inches is hereby authorized only if the lading is of such a nature that it cannot practically be reduced in dimensions.

(3) Lading higher than 15' 6" or extending laterally more than 5' 5 1/2".

(a) The movement of all open top cars having lading in excess of fifteen feet six inches in height, or which extends laterally in excess of five feet five and one-half inches from centerline of car will be authorized by written notice stating the total number of such cars and advising that no member of the train crew is required to ride on top of such high car or the side of any such wide car.

(b) A written notice shall be delivered to every train containing any car, the lading of which extends laterally in excess of 5' 5 1/2" from the centerline of the car or in excess of 15' 6" in height above top of rails, informing the crew of the train that the train includes such car or cars, stating the total number thereof and advising that no member of the train crew is required to ride on the side of any such wide car or top of any such high car.

(4) Notice to yard supervisors.

Yard supervisors shall be given notification sufficiently in advance of the arrival of such wide loads as described in subsection (3)(a) above as to enable them to take necessary precautions to safeguard employees in yard.

(5) Loads which cannot be passed over by employees.

Open top cars containing lading having an overall height in excess of fifteen feet six inches above top of rail, if otherwise in compliance with these requirements, and the nature of which precludes the possibility of employees passing over the cars, are exempt from the provisions of subsections (3)(a), (3)(b) and (4), but written notice must be given to all members of train crew informing them of the presence of such loads.

(6) Exemptions.

The common carrier railroads are hereby authorized to move excess height loads and width loads, as described in subsection (1) over roads or portions thereof, without complying with the provisions of WAC 296-28-040, provided that clearances equivalent to the minimum herein prescribed for cars having a height of fifteen feet six inches and width of ten feet ten inches are maintained. [Section 6, filed 4/3/61.]

WAC 296-28-045 Narrow gauge railroads transporting freight cars. (1) Overhead and side clearances.

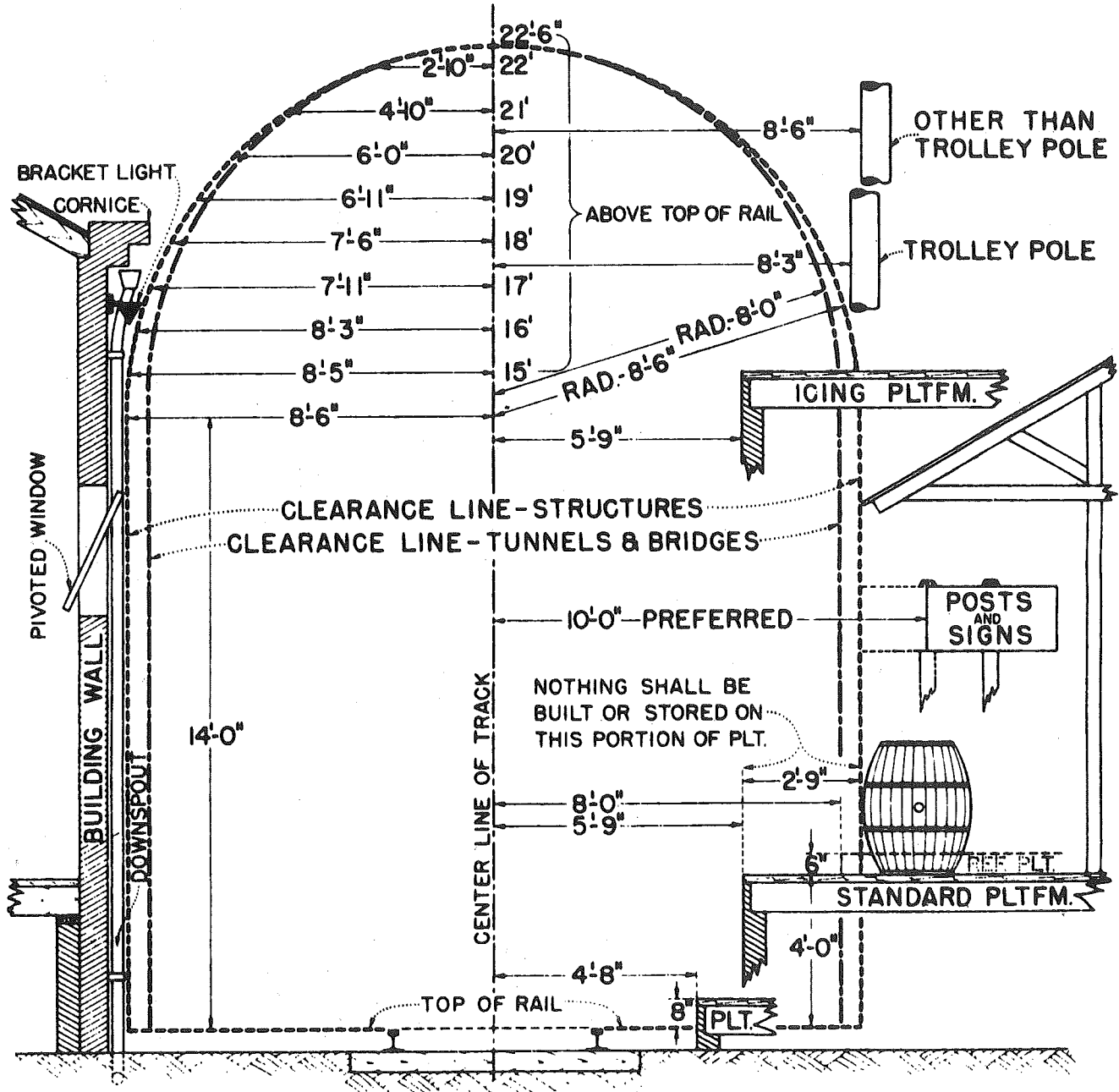
For the operation of equipment on narrow gauge tracks, the minimum overhead clearance shall provide a distance above the top of the highest car operated not less than that provided in this order for cars fifteen feet six inches in height operated on standard gauge tracks; the side clearances and distances between centerlines of tracks shall provide a distance from the sides of, or between the widest cars operated not less than those distances herein provided for cars ten feet ten inches in width operated on standard gauge tracks.

(2) All other requirements of this order where applicable shall be observed by narrow gauge railroads. [Section 7, filed 4/3/61.]

WAC 296-28-050 Illustrations.

(1)

TYPICAL CLEARANCE
OF STRUCTURES FROM RAILROAD TRACKS



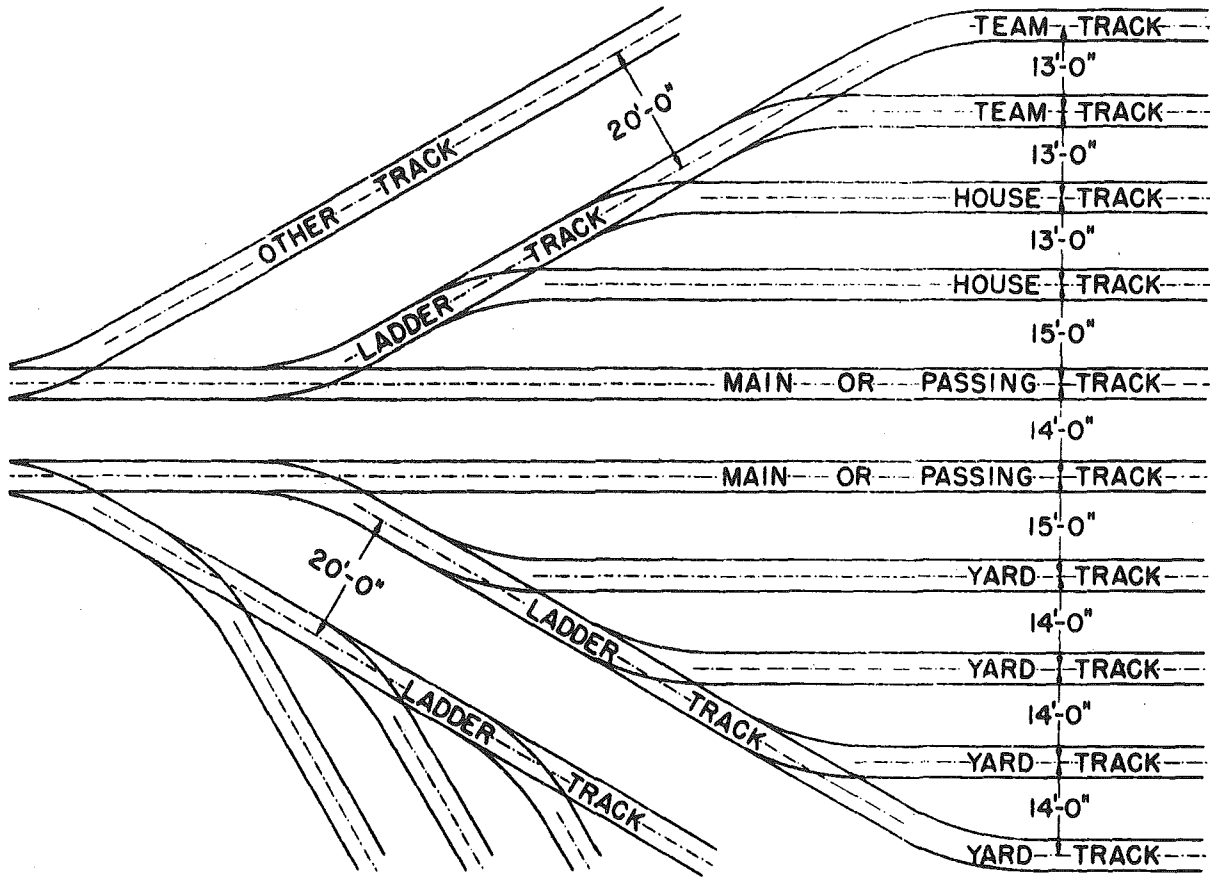
NOTES

OVERHEAD WIRE CLEARANCES SHALL CONFORM TO THE ELECTRICAL & COMMUNICATION WORKERS SAFETY RULES OF THE STATE OF WASHINGTON

SIDE CLEARANCES ON ALL STRUCTURES ADJACENT TO CURVED TRACK SHALL BE INCREASED TO GIVE THE EQUIVALENT OF TANGENT TRACK CLEARANCES

(2)

TYPICAL TRACK SPACING



NOTE

EXISTING TRACKS MAY BE EXTENDED AT CLEARANCES LAWFULLY PRESCRIBED PRIOR TO THE EFFECTIVE DATE OF THIS ORDER.

(3)

K-2

TERRAIN	CLASS I		CLASS II		CLASS III		CLASS IV		CLASS V		CLASS VI		FRONTAGE ROADS (a)						
	LEVEL	ROLLING	LEVEL	ROLLING	LEVEL	ROLLING	LEVEL	ROLLING	LEVEL	ROLLING	LEVEL	ROLLING	UNDER 200	UNDER 100					
ADT IN 20 YEARS	OVER 18,000	OVER 6,000	OVER 12,000	OVER 4,000	OVER 18,000	OVER 6,000	OVER 12,000	OVER 4,000	OVER 18,000	OVER 6,000	OVER 12,000	OVER 4,000	OVER 18,000	OVER 6,000					
DHV IN 20 YEARS	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150	OVER 1,000	OVER 1,150					
TRUCK ADT IN 10 YEARS	OVER 600	OVER 450	OVER 600	OVER 450	OVER 600	OVER 450	OVER 600	OVER 450	OVER 600	OVER 450	OVER 600	OVER 450	OVER 600	OVER 450					
SEPARATION OF ALL CROSS TRAFFIC REQUIRED	YES	Separate Where Cross Traffic Warrants	Separate Where Cross Traffic Warrants	Separate Where Cross Traffic Warrants	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO					
CONTROL OF ACCESS REQUIRED	FULL	According to Master Plan	According to Master Plan	According to Master Plan	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO					
NUMBER OF TRAFFIC LANES	4 or more (Divided)	4 (Divided)	4	2	2	2	2	2	2	2	2	2	2	1					
DESIGN SPEED M.P.H.	70	60	50	70	60	50	70	60	50	70	60	50	40	35	25	40	30	25	
CURVATURE	Desirable Maximum	3' 4'	4' 5'	6' 8'	3' 4'	4' 5'	6' 8'	3' 4'	4' 5'	6' 8'	3' 4'	4' 5'	6' 8'	9'-30" 13'	13' 18'	13' 18'	9'-30" 13'	13' 18'	20' 25'
GRADIENT	Desirable Maximum	2.5% 3%	3% 4%	2.5% 3%	3% 4%	2.5% 3%	3% 4%	2.5% 3%	3% 4%	2.5% 3%	3% 4%	2.5% 3%	3% 4%	6% 7%	7% 10%	7% 10%	6% 7%	7% 10%	7% 10%
SIGHT DISTANCE	Min. Safe Stopping Min. Safe Passing	600' 475'	475' 350'	600' 475'	475' 350'	600' 475'	475' 350'	600' 475'	475' 350'	600' 475'	475' 350'	600' 475'	475' 350'	275' 225'	225' 180'	150' 100'	275' 225'	200' 150'	150' 100'
TRAFFIC LANE WIDTH		12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'	12'
SHOULDER WIDTH		10'	10'(a)	10'	10'(a)	10'	10'(a)	10'	10'(a)	10'	10'(a)	10'	10'(a)	8'	8'(a)	4'	4'	4'	3'
MIN. MEDIAN WIDTH		15'	4'	15'	4'	15'	4'	15'	4'	15'	4'	15'	4'	15'	4'	15'	4'	15'	4'
PAVEMENT TYPE (b)	High	High	High	High	High	High	High	High	High	High	High	High	High	Low or (Intermedia)	Low or (Intermedia)	Low or (None)	Low or (None)	Low or (None)	Low or (None)
MIN. RIGHT OF WAY WIDTH	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required
ILLUMINATION	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required	As Required
STRUCTURES (Minimum Standards)	H20-S16		H20-S16		H20-S16		H15-S12		H15-S12		H15-S12		H15-S12		H15-S12		H15-S12		
Load Capacity	H20-S16		H20-S16		H20-S16		H15-S12		H15-S12		H15-S12		H15-S12		H15-S12		H15-S12		
Vertical Clearance	14'-6" Minimum		14'-6" Minimum		14'-6" Minimum		15'-0" Desirable		15'-0" Desirable		15'-0" Desirable		15'-0" Desirable		15'-0" Desirable		15'-0" Desirable		
Bridge Width (10 to 60 Lanes)	69'		69'		69'		42'		36'		26'		24'		26'		24'		
Bridge Width (Over 60 Lanes)	56'		56'		56'		28'		26'		26'		24'		26'		24'		

NOTES:
 (a) Shoulder width may be reduced to 4 feet for short sections in heavy rock excavation.
 (b) Definitions of Pavement Types:
 "High" - Cons. Cons. 6" Min. on Adequate Base
 "Low" - Cons. Cons. 2" Min. on Cons. Base
 "Inter." - Cons. Cons. 4" Min. on
 "Bit. Pav." - Cons. Cons. 1" Min. on Adequate Base
 "Low" - Cons. Cons. 2" Min. on Cons. Base
 *Exceptions are possible in arid areas
 Types in () should be secondary choice
 (c) Frontage Roads: For volumes over 1000 ADT, use Class III Highway for 30 mph design speed.
 Interstate Routes: Interstate should will apply.

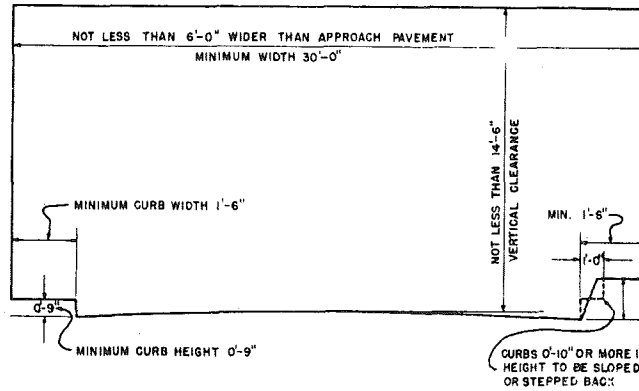
TERRAIN	PER CENT SIGHT RESTRICTED	MAXIMUM DHV FOR CLASS OF HIGHWAY SHOWN													
		0% TRUCKS		5% TRUCKS		10% TRUCKS		15% TRUCKS		20% TRUCKS		25% TRUCKS		30% TRUCKS	
		CLASS III	CLASS IV	CLASS III	CLASS IV	CLASS III	CLASS IV	CLASS III	CLASS IV	CLASS III	CLASS IV	CLASS III	CLASS IV	CLASS III	CLASS IV
LEVEL	0	900	770	640	720	780	670	740	630	690	530	680	620	670	530
	20	860	740	600	690	750	640	700	610	660	570	630	540	590	510
	40	800	690	540	640	700	600	650	560	610	530	580	500	480	
ROLLING	0	900	770	640	720	780	670	740	630	690	530	680	620	670	530
	20	860	740	600	690	750	640	700	610	660	570	630	540	590	510
	40	800	690	540	640	700	600	650	560	610	530	580	500	480	
MOUNT.	0	900	770	640	720	780	670	740	630	690	530	680	620	670	530
	20	860	740	600	690	750	640	700	610	660	570	630	540	590	510
	40	800	690	540	640	700	600	650	560	610	530	580	500	480	

NOTES ON DESIGN CAPACITY TABLE:
 Procedure in use of table:
 1. Determine (a) type of terrain, (b) % of length that sight distance is restricted to less than 1500 feet, (c) % of trucks, (d) DHV estimated for 20 years hence.
 2. Select the class of highway required from the table using the above four conditions.
 3. When the truck ADT requires a higher class of highway than the findings from this table indicate, the truck ADT shall govern.
 Ratio of ADT to DHV varies with every case. DHV generally overages 10% to 15% of ADT.
 Consideration should be given to climbing lanes as compared with going to a higher class of highway.
 Reference: Highway Capacity Manual.

STANDARD
 GEOMETRIC DESIGN STANDARDS
 FOR RURAL STATE HIGHWAYS
 DEVELOPED BY THE
 ILLINOIS STATE HIGHWAY COMMISSION
 DEPARTMENT OF TRANSPORTATION
 CHICAGO, ILLINOIS
 APPROVED FEB 11 1953

(4)

**CLEARANCE DIAGRAM FOR UNDERPASSES
TWO-WAY HIGHWAY TRAFFIC**



REFERENCE:
STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES - THE AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS.

[Illustrations, filed 4/3/61.]

**Chapter 296-32 WAC
SAFETY STANDARDS FOR
TELECOMMUNICATIONS**

WAC

- 296-32-200 Scope and application.
- 296-32-210 Definitions.
- 296-32-215 Safe place standard.
- 296-32-220 General.
- 296-32-230 Training.
- 296-32-240 Employee protection in public work areas.
- 296-32-250 Tools and personal protective equipment—General.
- 296-32-260 Rubber insulating equipment.
- 296-32-270 Personal climbing equipment.
- 296-32-280 Ladders.
- 296-32-290 Vehicle-mounted material handling devices and other mechanical equipment.
- 296-32-300 Materials handling and storage.
- 296-32-310 Cable fault locating and testing.
- 296-32-320 Grounding for employee protection—Pole lines.
- 296-32-330 Overhead lines.
- 296-32-340 Underground lines and cable vaults.
- 296-32-350 Microwave transmission.
- 296-32-360 Tree trimming—Electrical hazards.
- 296-32-370 Buried facilities—Communications lines and power lines in the same trench.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

- 296-32-001 Foreword—Effective date. [Foreword, effective 4/1/66.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-010 Statements of fact—Construction of rules. [Rules (part), effective 4/1/66; Regulations 1.3, 1.4, 1.7, 1.8, 1.9, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-011 Procedure for settling controversy. [Rules (part), effective 4/1/66; Regulation 1.6, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-020 Causes of accident. [Rules (part), effective 4/1/66; Regulation 1.10, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-030 Causes of accident—Safety. [Rules (part), effective 4/1/66; Regulation 1.11, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-040 Definitions. [Definitions, effective 4/1/66; Regulations 1.12-1.25, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-050 Employer's responsibility. [Rules (part), effective 4/1/66; Regulations 2.1-2.11, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-060 Foreman's responsibility [Rules (part), effective 4/1/66; Regulations 2.12-2.23, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-070 Employee's responsibility. [Rules (part), effective 4/1/66; Regulations 2.24-2.31, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.

- 296-32-080 First-aid. [Rules (part), effective 4/1/66; Regulations 3.1—3.4, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-090 Industrial hygiene. [Rules (part), effective 4/1/66; Regulations 3.5—3.7, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-094 Overhead work. [Rules (part), effective 4/1/66.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-098 Molten solder handling. [Rules (part), effective 4/1/66.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-100 Aerial plant. [§ VI, Rules 6.010—6.100, effective 4/1/66; Regulations 4.1—4.15, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-110 Underground plant. [§ VII, Rules 7.010—7.120, effective 4/1/66; Regulations 5.1—5.12, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-120 Central office plant. [§ IV, Rules 4.010—4.060, effective 4/1/66; Regulations 6.1—6.7, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-130 Tools and protective devices. [§ II, Rules 2.010—2.460, effective 4/1/66; Regulations 7.1—7.50, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-140 Motor vehicles, work equipment and transportation. [§ III, Rules 3.010—3.160, effective 4/1/66; Regulations 8.1—8.14, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-150 Power exposures. [§ VIII, Rules 8.010—8.200, effective 4/1/66; Regulations 9.1—9.20, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-160 General safety requirements. [§ I, Rules 1.010—1.120, effective 4/1/66; Rules 10.2—10.7, 10.10, 10.11, 10.14, 10.15, 10.16, 10.17, filed 3/23/60.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-170 Manlift equipment. [§ V, Rules 5.010—5.090, effective 4/1/66.] Repealed by Order 77-12, filed 7/11/77.
- 296-32-180 Electronic communication equipment. [§ IX, Rules 9.010—9.120, effective 4/1/66.] Repealed by Order 77-12, filed 7/11/77.

WAC 296-32-200 Scope and application. (1) This chapter sets forth safety and health standards that apply to the work conditions, practices, means, methods, operations, installations and processes performed at telecommunications centers and at telecommunications field installations, which are located outdoors or in building spaces used for such field installations. "Center" work includes the installation, operation, maintenance, rearrangement, and removal of communications equipment and other associated equipment in telecommunications switching centers. "Field" work includes the installation, operation, maintenance, rearrangement, and removal of conductors and other equipment used for signal or communication service, and of their supporting or containing structures, overhead or underground, on public or private rights of way, including buildings or other structures.

(2) These standards do not apply: (a) To construction work, as defined in chapter 296-155 WAC, nor

(b) To installations under the exclusive control of electric utilities used for the purpose of communications or metering, or for generation, control, transformation, transmission, and distribution of electric energy, which are located in buildings used exclusively by the electric utilities for such purposes, or located outdoors on property owned or leased by the electric utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(3) Operations or conditions not specifically covered by this chapter are subject to all the applicable standards contained in chapter 296-24 WAC, General Safety

and Health Standards. Operations which involve construction work, as defined in chapter 296-155 WAC are subject to all the applicable standards contained in chapter 296-155 WAC, Safety Standards for Construction Work.

(4) 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 296-32 WAC, shall apply.

(5) 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. [Order 76-38, § 296-32-200, filed 12/30/76; Order 75-41, § 296-32-200, filed 12/19/75.]

WAC 296-32-210 Definitions. (1) The terms used in these standards shall be interpreted in the most commonly accepted sense consistent with the communications industry. The words "shall" and "must," are used to indicate the provisions which are mandatory.

(2) "Aerial Lifts." Aerial lifts include the following types of vehicle-mounted aerial devices used to elevate personnel to jobsites above ground:

- (a) Extensible boom platforms,
- (b) Aerial ladders,
- (c) Articulating boom platforms,
- (d) Vertical towers,

(e) A combination of any of the above defined in ANSI A92.2-1969. These devices are made of metal, wood, fiberglass, reinforced plastic (FRP), or other material; are powered or manually operated and are deemed to be aerial lifts whether or not they are capable of rotating above a substantially vertical axis.

(3) "Aerial splicing platform." This consists of a platform, approximately 3 feet x 4 feet, used to perform aerial cable work. It is furnished with fiber or synthetic ropes for supporting the platform from aerial strand, detachable guy ropes for anchoring it, and a device for raising and lowering it with a handline.

(4) "Aerial tent." A small tent usually constructed of vinyl coated canvas which is usually supported by light metal or plastic tubing. It is designed to protect employees in inclement weather while working on ladders, aerial splicing platforms, or aerial devices.

(5) "Alive or live (energized)." Electrically connected to a source of potential difference, or electrically charged so as to have a potential significantly different from that of the earth in the vicinity. The term "live" is sometimes used in the place of the term "current-carrying," where the intent is clear, to avoid repetition of the longer term.

(6) "Barricade." A physical obstruction such as tapes, cones, or "A" frame type wood and/or metal structure intended to warn and limit access to a work area.

(7) "Barrier." A physical obstruction which is intended to prevent contact with energized lines or equipment, or to prevent unauthorized access to work area.

(8) "Bond." An electrical connection from one conductive element to another for the purpose of minimizing potential differences or providing suitable conductivity for fault current or for mitigation of leakage current and electrolytic action.

(9) "Cable." A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable), or a combination of conductors insulated from one another (multiple-conductor cable).

(10) "Cable sheath." A protective covering applied to cables.

NOTE: A cable sheath may consist of multiple layers of which one or more is conductive.

(11) "Circuit." A conductor or system of conductors through which an electric current is intended to flow.

(12) "Clearance." (a) The certification by the proper authority that a specified line or piece of equipment is de-energized; that the proper precautionary measures have been taken and that the line or equipment is being turned over to the workers.

(b) Separation or protection by the use of protective devices to prevent accidental contact by persons or objects on approach to a point of danger.

(13) "Climbing space." The vertical space reserved along the side of poles or structures to permit ready access for linemen to equipment and conductors located on poles or structures.

(14) "Communication lines." The conductors and their supporting or containing structures for telephone, telegraph, railroad signal, data, clock, fire, police-alarm, community television antenna and other systems which are used for public or private signal or communication service, and which operate at potentials not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. When communications lines operate at less than 150 volts to ground, no limit is placed on the capacity of the system. Specifically designed communications cables may include communication circuits not complying with the preceding limitations, where such circuits are also used incidentally to supply power to communication equipment.

(15) "Communication plant." The conductors and their associated equipment required to provide public or private signals or communicative service.

(16) "Competent or qualified person." A person who is familiar with the construction of, or operation of, such lines and/or equipment that concerns his position and who is fully aware of the hazards connected therewith OR one who has passed a journeyman's examination for the particular branch of the trades with which he may be connected. In case of dispute, competency shall be established by a committee appointed by the Assistant

Director of the Division of Industrial Safety and Health consisting of representatives of all interested parties.

(17) "Conductor." A material, usually in the form of a wire, cable, or bus bar, suitable for carrying an electric current.

(18) "Effectively grounded." Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the build-up of voltages which may result in undue hazard to connected equipment or to persons.

(19) "Emergency." When an unusual condition exists that endangers life and/or property.

(20) "Energized." Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment. For the purpose of these rules, potential differences less than 100 volts shall not apply. This definition does not include communication lines of less than 300 volts.

(21) "Equipment." A general term which includes materials, fittings, devices, appliances, fixtures, apparatus, and similar items used as part of, or in connection with, a supply or communications installation.

(22) "Foreman or man-in-charge." That person directly in charge of workers doing the work regardless of title.

(23) "Ground (reference)." That conductive body usually earth, to which an electric potential is referenced.

(24) "Ground (as a noun)." A conductive connection, whether intentional or accidental, by which an electric circuit or equipment is connected to reference ground.

(25) "Ground (as a verb)." The connecting or establishment of a connection, whether by intention or accident, of an electric circuit or equipment to reference ground.

(26) "Grounding." The act of placing shorts and grounds on conductors and equipment for the purpose of protecting workers from dangerous voltages while working on such lines or equipment.

(27) "Ground tent." A small tent usually constructed of vinyl coated canvas supported by a metal or plastic frame. Its purpose is to protect employees from inclement weather while working at buried cable pedestal sites or similar locations.

(28) "Grounded conductor." A system or circuit conductor which is intentionally grounded.

(29) "Grounded systems." A system of conductors in which at least one conductor or point (usually the middle wire, or the neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device (not a current-interrupting device).

(30) "Grounding electrode conductor (grounding conductor)." A conductor used to connect equipment or the grounded circuit of a wiring system to a grounding electrode.

(31) "Guard or guarded." Covered, shielded, fenced, enclosed, or otherwise protected by means of suitable covers, casings, barriers, rails, screens, mats, platforms, or warning signs or devices to remove the possibility of

dangerous contact on approach by other persons or objects to a point of danger.

(32) "Insulated." Separated from other conducting surfaces by a dielectric substance (including air space) offering a high resistance to the passage of current.

NOTE: When any object is said to be insulated, it is understood to be insulated in suitable manner for the conditions to which it is subjected. Otherwise, it is, within the purpose of these standards, uninsulated. Insulating coverings of conductors is one means of making the conductor insulated.

(33) "Insulation (as applied to cable)." That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

(34) "Joint use." The sharing of a common facility, such as a manhole, trench or pole, by two or more different kinds of utilities, (e.g., power and telecommunications).

(35) "Ladder platform." A device designed to facilitate working aloft from an extension ladder. A typical device consists of a platform (approximately 9" x 18") hinged to a welded pipe frame. The rear edge of the platform and the bottom crossmember of the frame are equipped with latches to lock the platform to ladder rungs.

(36) "Ladder seat." A removable seat used to facilitate work at an elevated position on rolling ladders in telecommunication centers.

(37) "Manhole." A subsurface enclosure which personnel may enter and which is used for the purpose of installing, operating, and maintaining submersible equipment and/or cable.

(38) "Manhole platform." A platform consisting of separate planks which are laid across steel platform supports. The ends of the supports are engaged in the manhole cable racks.

(39) "Manlift equipment." Such types of portable truck-mounted equipment as mechanical, electric or hydraulic ladders and boom-mounted buckets or cages.

(40) "Microwave transmission." The act of communicating or signaling utilizing a frequency between 1 GHz_z (gigahertz) and 300 GHz_z inclusively.

(41) "Nominal voltage." The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The actual voltage may vary above or below this value.

(42) "Pole balcony or seat." A balcony or seat used as a support for workers at pole-mounted equipment or terminal boxes. A typical device consists of a bolted assembly of steel details and a wooden platform. Steel braces run from the pole to the underside of the balcony. A guard rail (approximately 30" high) may be provided.

(43) "Pole platform." A platform intended for use by a worker in splicing and maintenance operations in an elevated position adjacent to a pole. It consists of a platform equipped at one end with a hinged chain binder for securing the platform to a pole. A brace from the pole to the underside of the platform is also provided.

(44) "Protection from hazardous voltage." The isolation from or de-energizing of equipment to prevent accidental contact by persons or objects on approach to point of danger.

(45) "Protective devices." Those devices such as rubber gloves, rubber blankets, line hose, rubber hoods or other insulating devices, which are specially designed for the protection of workers.

(46) "Public highway." Every way, land, road, street, boulevard, and every way or place in the state open as matter of right to public vehicular travel, both inside and outside the limit of cities and towns.

(47) "Qualified employee." Any worker who by reason of his training and experience has demonstrated his ability to safely perform his duties.

(48) "Qualified line-clearance tree trimmer." A tree worker who through related training and on-the-job experience is familiar with the special techniques and hazards involved in line clearance.

(49) "Qualified line-clearance tree-trimmer trainee." Any worker regularly assigned to a line-clearance tree-trimming crew and undergoing on-the-job training who, in the course of such training, has demonstrated his ability to perform his duties safely at his level of training.

(50) "Sheath." As applied to sharp tools that effectively covers the tool.

(51) "System operator/owner." The person or organization that operates or controls the electrical conductors involved.

(52) "Telecommunications center." An installation of communication equipment under the exclusive control of an organization providing telecommunications service, that is located outdoors or in a vault, chamber, or a building space used primarily for such installations.

NOTE: Telecommunication centers are facilities established, equipped and arranged in accordance with engineered plans for the purpose of providing telecommunications service. They may be located on premises owned or leased by the organization providing telecommunication service, or on the premises owned or leased by others. This definition includes switch rooms (whether electromechanical, electronic, or computer controlled), terminal rooms, power rooms, repeater rooms, transmitter and receiver rooms, switchboard operating rooms, cable vaults, and miscellaneous communications equipment rooms. Simulation rooms of telecommunication centers for training or developmental purposes are also included.

(53) "Telecommunications derricks." Rotating or nonrotating derrick structures permanently mounted on vehicles for the purpose of lifting, lowering, or positioning hardware and materials used in telecommunications work.

(54) "Telecommunication line truck." A truck used to transport men, tools, and material, and to serve as a traveling workshop for telecommunication installation and maintenance work. It is sometimes equipped with a

boom and auxiliary equipment for setting poles, digging holes, and elevating material or workers.

(55) "Telecommunication service." The furnishing of a capability to signal or communicate at a distance by means such as telephone, telegraph, police and fire-alarm, community antenna television, or similar system, using wire, conventional cable, coaxial cable, wave guides, microwave transmission, or other similar means.

(56) "Unvented vault." An enclosed vault in which the only openings are access openings.

(57) "Vault." An enclosure above or below ground which personnel may enter, and which is used for the purpose of installing, operating, and/or maintaining equipment and/or cable which need not be of submersible design.

(58) "Vented vault." An enclosure as described in subsection (57) of this section, with provision for air changes using exhaust flue stack(s) and low level air intake(s), operating on differentials of pressure and temperature providing for air flow.

(59) "Voltage communications." Voltage used for electronic communications equipment to which workers or protective equipment may be subjected.

(a) *High* means over 600 volts to ground—RMS AC or DC or over 1,000 volts RMS across bare parts.

(b) *Medium high* means 151 to 600 volts to ground—RMS AC or DC or 301 to 1,000 volts RMS AC across any bare parts.

(60) "Voltage electric supply." The maximum effective line voltage to which the workers or protective equipment may be subjected.

(a) *Low* includes voltages from 100 to 750 volts.

(b) *High* means those voltages in excess of 750 volts.

(61) "Voltage of an effectively grounded circuit." The voltage between any conductor and ground unless otherwise indicated.

(62) "Voltage of a circuit not effectively grounded." The voltage between any two conductors. If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an autotransformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction. [Order 76-38, § 296-32-210, filed 12/30/76; Order 75-41, § 296-32-210, filed 12/19/75.]

WAC 296-32-215 Safe place standard. (1) No employer shall require any employee to go or be in any employment or place of employment which is not safe.

(2) No employer shall fail or neglect:

(a) Provide safe access to the work site.

(b) To provide and use safety devices and safeguards.

(c) To adopt and use methods and processes to render the employment and place of employment safe.

(d) To do every other thing reasonably necessary to protect the life and safety of employees. [Order 76-38, § 296-32-215, filed 12/30/76.]

WAC 296-32-220 General. (1) Buildings Containing Telecommunications Centers. (a) Illumination. Lighting in telecommunication centers shall be provided in an amount such that continuing work operations, routine observations, and the passage of employees can be carried out in a safe and healthful manner.

(b) Specific tasks in centers, such as splicing cable and the maintenance and repair of equipment frame lineups, the employer shall install permanent lighting or portable supplemental lighting to attain a higher level of illumination.

(c) Refer to WAC 296-62-09003 (General Occupational Health Standards) which shall apply as minimum standards of illumination for Industrial Interiors.

(d) Illumination of Field Work. Whenever natural light is insufficient to illuminate the worksite, artificial illumination shall be provided to enable the employee to perform the work safely.

(2) Working surfaces. (a) Working surfaces shall be in conformance with the latest edition of the General Safety and Health Standard WAC 296-24-735 through WAC 296-24-76523.

(b) Guard rails and toe boards may be omitted on distribution frame mezzanine platforms to permit access to equipment. This exemption applies only on the side or sides of the platform facing the frames and only on those portions of the platform adjacent to equipped frames.

(3) Working spaces. (a) Space shall be provided for access to all medium high and high voltage equipment.

(b) Every structure, new or old, designed for human occupancy shall be provided with exits to permit the prompt escape of occupants in case of fire or other emergency. The means of egress shall be a continuous and unobstructed way of exit travel from any point in a building or structure to a public way and consist of three separate and distinct parts; the way of exit access, the exit and the way of exit discharge. A means of egress comprises the vertical and horizontal ways of travel and shall include intervening room spaces, doorways, hallways, corridors, passageways, balconies, ramps, stairs, enclosures, lobbies, escalators, horizontal exits, courts and yards.

(c) "Maintenance aisles," or "wiring aisles," between equipment frame lineups are working spaces and are not a means of egress for purposes of WAC 296-24-550(1).

(4) Special doors. (a) When blastproof or power actuated doors are installed in specially designed hardsite security buildings and spaces, they shall be designed and installed so that they can be used as a means of egress in emergencies.

(b) When high voltage apparatus is isolated in a supplementary enclosure, interlocks shall be provided on all access doors. Warning signs shall be provided, which are visible both when the guard or cover is in place or removed.

(5) Equipment, machinery and machine guarding. (a) When power plant machinery in telecommunications centers is operated with commutators and couplings uncovered, the adjacent housing shall be clearly marked to alert personnel to the rotating machinery.

(b) All power switches on power panels shall be in an open position when they are not controlling an operating

circuit. Before opening any power circuit, the load shall be reduced. "Men working" signs shall be placed on switches associated with motors or generators under repair.

(c) When working on the brushes of a machine in operation, employees shall use care not to break a circuit. When it is necessary to remove a brush from the holder, the machine shall be shut down.

(d) Only fuse pullers specifically designed for that purpose shall be used when replacing cartridge type fuses.

(6) Battery Handling. (a) Eye protection devices which provide side as well as frontal eye protection for employees shall be provided when measuring storage battery specific gravity or handling electrolyte, and the employer shall ensure that such devices are used by the employees.

(b) The employer shall also ensure that acid resistant gloves and aprons shall be worn for protection against spattering.

(c) Facilities for quick drenching or flushing of the eyes and body shall be provided unless the storage batteries are of the enclosed type and equipped with explosion proof vents, in which case sealed water rinse or neutralizing packs may be substituted for the quick drenching or flushing facilities.

(d) Employees assigned to work with storage batteries shall be instructed in emergency procedures such as dealing with accidental acid spills.

(e) Electrolyte (acid or base, and distilled water) for battery cells shall be mixed in a well ventilated room. Acid or base shall be poured gradually, while stirring, into the water. Water shall never be poured into concentrated (greater than 75 percent) acid solutions. Electrolyte shall never be placed in metal containers nor stirred with metal objects.

(f) When taking specific gravity readings, the open end of the hydrometer shall be covered with an acid resistant material while moving it from cell to cell to avoid splashing or throwing the electrolyte.

(g) Ventilation, shall be provided to ensure diffusion of the gasses from the battery to prevent the accumulation of an explosive type mixture.

(h) Racks and trays shall be substantial and treated to be resistant to the electrolyte.

(i) Floors shall be of acid resistant construction or be protected from acid accumulation.

(7) Hazardous Materials. (a) Highway mobile vehicles and trailers stored in garages in accordance with WAC 296-24-47513(4)(b) may be equipped to carry more than one LP-gas container, but the total capacity of LP-gas containers per work vehicle stored in garages shall not exceed 100 pounds of LP-gas.

(b) All container valves shall be closed when not in use.

(8) Compressed Gas. (a) When using or transporting nitrogen cylinders, special compartments, racks, or blocking shall be provided to prevent cylinder movement.

(b) Regulators shall be removed or guarded before a cylinder is transported.

(9) Support Structures. (a) No employee, or any material or equipment, shall be supported or permitted to

be supported on any portion of a pole structure, platform, ladder, walkway or other elevated structure or aerial device unless the employer ensures that the support structure is first inspected by a competent person and it is determined to be strong, in good working condition and properly secured in place.

(b) Workmen shall not throw anything from pole to ground, from pole to pole or from ground to pole.

(10) Power Exposures. (a) The employer shall ensure that no employee approaches or takes any conductive object closer to any electrically energized overhead power lines and parts than prescribed in Table 1 unless:

(i) The employee is insulated or guarded from the energized parts (insulating gloves rated for the voltage involved shall be considered adequate insulation), or

(ii) The energized parts are insulated or guarded from the employee and any other conductive object at a different potential, or

(iii) The power conductors and equipment are deenergized and grounded.

(b) While handling communication wires, metal sheaths, or communication equipment, contact shall be avoided with street lamp brackets, trolley span wires, power guys, transformer cases and any other power equipment that may be energized. The safest possible working position shall be assumed before starting work.

(c) Communication employees shall never work in the pole space on jointly used poles between normal primary and secondary attachments.

(d) Where a hazard of a power contact exists, due to use of long handled tools, proper rubber equipment shall be used.

TABLE 1
APPROACH DISTANCES TO EXPOSED
ENERGIZED
OVERHEAD POWER LINES AND PARTS

Voltage Range (phase to phase, RMS)	Approach Distance (inches)
300 V and less _____	(1)
Over 300 V, not over 750 V _____	12
Over 750 V not over 2 kV _____	18
Over 2 kV, not over 15 kV _____	24
Over 15 kV, not over 37 kV _____	36
Over 37 kV, not over 87.5 kV _____	42
Over 87.5 kV, not over 121 kV _____	48
Over 121 kV, not over 140 kV _____	54

(1) Avoid contact.

[Order 76-38, § 296-32-220, filed 12/30/76; Order 75-41, § 296-32-220, filed 12/19/75.]

WAC 296-32-230 Training. (1) Employers shall provide training in the various precautions and safe practices described in this section and shall insure that employees do not engage in the activities to which this chapter applies until such employees have received proper training in the various precautions and safe practices required by this section. However, where the employer can demonstrate that an employee is already trained in

the precautions and safe practices required by this section prior to his employment, training need not be provided to that employee in accordance with this section.

(2) Where training is required, it shall consist of on-the-job training or classroom-type training or a combination of both.

(3) The training program shall include a list of the subject courses and the types of personnel required to receive such instruction. A written description of the training program and a record of employees who have received such training shall be maintained for the duration of the employee's employment and shall be made available upon request to the Assistant Director of Industrial Safety and Health, or his authorized representative.

(4) Such training shall, where appropriate, include the following subjects:

(a) Recognition and avoidance of dangers relating to encounters with harmful substances, and animal, insect, or plant life.

(b) Procedures to be followed in emergency situations, and

(c) First aid training, including instruction in artificial respiration.

(5) It shall be the responsibility of the employer to hold monthly safety meetings at practical points throughout the operation and insist upon employees attending said meetings. Minutes shall be kept of each safety meeting and retained for a period of one year. [Order 76-38, § 296-32-230, filed 12/30/76; Order 75-41, § 296-32-230, filed 12/19/75.]

WAC 296-32-240 Employee protection in public work areas. (1)(a) Before work is begun in the vicinity of vehicular or pedestrian traffic which may endanger employees, warning signs and/or flags or other traffic control devices shall be placed conspicuously to alert and channel approaching traffic. Where further protection is needed, barriers shall be utilized.

(b) At night, warning lights shall be prominently displayed, and excavated areas shall be enclosed with protective barricades.

(2) When work exposes energized or moving parts that are normally protected, danger signs shall be displayed and barricades erected to warn other personnel in the area.

(3) The employer shall insure that an employee finding any crossed or fallen wires which create or may create a hazardous situation at the work area:

(a) Remains on guard or adopts other adequate means to warn other employees of the danger, and

(b) Has the proper authority notified at the earliest practical moment. [Order 76-38, § 296-32-240, filed 12/30/76; Order 75-41, § 296-32-240, filed 12/19/75.]

WAC 296-32-250 Tools and personal protective equipment—General. (1) Personal protective equipment, protective devices and special tools needed for the work of employees shall be provided and the employer shall ensure that they are used by employees.

(a) Before each day's use the employer shall ensure that these personal protective devices, tools, and equipment are carefully inspected by a competent person to ascertain that they are in good condition.

(b) Tools found to be defective shall be taken out of service.

(2) Head Protection. Head protection meeting the requirements of ANSI Z89.2-1971, "Safety Requirements for Industrial Protective Helmets for Electrical Workers, Class B" shall be provided whenever there is exposure to Overhead hazards and/or possible high voltage electrical contact.

(a) Employees working in areas where there is a possible danger of head injury from impact, falling or flying objects, shall be protected by protective helmets. These helmets shall meet the specifications contained in American National Standards Institute, Z89.1-1969, Safety Requirements for Industrial Head Protection.

(b) The employer shall insure that the head protection is used by the employee.

(3) Eye Protection. Protective eye and face equipment shall be required where there is a possibility of injury that can be prevented by such equipment. In such cases, employers shall make conveniently available a type of protector suitable for the work to be performed, and employees shall use such protectors.

(4) Tent Heaters, Torches and Open Flame. Open flames shall not be used within ground tents or on platforms within aerial tents unless:

(a) The tent covers are constructed of fire resistant materials, and

(b) Ventilation is provided to maintain safe oxygen levels and avoid harmful buildup of combustion products and combustible gases.

(5) Portable Power Equipment. (a) All portable power equipment used in the Telecommunications Industry shall be grounded.

(b) Nominal 120V, or less, portable generators used for providing power at work locations do not require grounding if the output circuit is completely isolated from the frame of the unit.

(c) Grounding shall be omitted when using soldering irons, guns or wire-wrap tools on telecommunication circuits.

(6) Vehicle-mounted Utility Generators. Vehicle-mounted utility generators used for providing nominal 240V AC or less for powering portable tools and equipment need not be grounded to earth if all of the following conditions are met:

(a) One side of the voltage source is solidly strapped to the metallic structure of the vehicle;

(b) Grounding-type outlets are used, with a "grounding" conductor between the outlet grounding terminal and the side of the voltage source that is strapped to the vehicle;

(c) All metallic encased tools and equipment that are powered from this system are equipped with three-wire cords and grounding-type attachment plugs, except as designated in subsection (7) of this section.

(7) Portable Lights, Tools and Appliances. When operated from commercial power such metal parts of these

devices shall be grounded, unless these tools or appliances are protected by a system of double insulation, or its equivalent. Where such a system is employed, the equipment shall be distinctively marked to indicate double insulation.

(8) Lead Work. When operated from commercial power the metal housing of electric solder pots shall be grounded. Electric solder pots may be used with the power equipment described in this subsection, without a grounding conductor.

(a) The employer shall ensure that wiping gloves or cloths and eye protection are used in lead wiping operations. A drip pan to catch hot lead drippings shall also be provided and used.

(9) Fire Extinguishers. (a) Fire extinguishers shall be provided for the protection of both the building structure and the occupancy hazards contained therein.

(b) Employees shall be familiar with the location and operation of fire extinguishers.

(c) Any fire extinguishers showing defects shall be removed from service.

(d) Fire extinguishers shall be thoroughly examined and/or recharged or repaired to insure operability and safety once every year.

(e) Each fire extinguisher shall have a durable tag securely attached to show the maintenance or recharge date and the initials or signature of the person performing this service. [Order 76-38, § 296-32-250, filed 12/30/76; Order 75-41, § 296-32-250, filed 12/19/75.]

WAC 296-32-260 Rubber insulating equipment. (1) Rubber insulating equipment designed for the voltage levels to be encountered shall be provided and the employer shall ensure that they are used by employees as required by this section. This equipment shall meet the electrical and physical requirements contained in ANSI J6.6-1971 "Standard Specifications for Rubber Insulating Gloves," and ANSI J6.4-1971 "Standard Specifications for Rubber Insulating Blankets," with the exception that the maximum proof test current for a 14-inch Class I glove shall be no more than 14mA, and with the further exception that existing 14-inch Class I rubber gloves that meet a maximum proof test current of 14 mA and a minimum breakdown voltage of 10,000 volts (RMS) acquired prior to January 1, 1976, may be used as long as these gloves comply with the retest requirements of subsection (2) of this section.

(2) The employer is responsible for periodic retesting of all insulating gloves, blankets, and other rubber insulating equipment. This retesting shall be electrical, visual and mechanical. The following maximum retesting intervals shall apply:

Gloves, Blankets, and Other Insulating Equipment	Natural Rubber (Months)	Synthetic Rubber (Months)
New _____	12	18
Reissued _____	9	15

(3) Protector for Gloves. Approved protectors must be worn at all times over rubber gloves. Inner liners may be worn if desired.

(4) Protective equipment fabricated of material other than rubber shall provide electrical and mechanical protection at least equal to that of the rubber equipment.

(5)(a) Gloves and blankets shall be marked to indicate compliance with the retest schedule and shall be marked with the date the next test date is due.

(b) Any rubber gloves found to be defective shall be removed from service and marked as being defective.

(6) Insulating gloves and blankets shall be stored away from direct sunlight, steampipes, radiators and other sources of excessive heat.

(7) Gloves and blankets shall not be folded while in storage. A separate container shall be provided for rubber blankets and blankets shall be wiped clean and rolled before placing in container.

(8) Inspect rubber goods. Before using a pair of rubber gloves or rubber blankets, workers shall personally inspect each glove for defects and give an air test, and the blanket shall be visually inspected for cracks or cuts before using.

NOTE: Grasp the cuff at opposite sides and twirl the gloves so as to roll it up the cuff and produce air pressure within the glove, then look for leaks and thin places in the rubber.

(9) Patching rubber goods is prohibited; rubber protective equipment shall not be vulcanized or patched.

(10) Rubber gloves for workers. A pair of rubber gloves, specifically designed for the protection of workers, shall be assigned each worker when required to work on or be exposed to energized parts.

(b) Rubber gloves when not in use shall be carried in a bag provided and designed for that purpose. [Order 76-38, § 296-32-260, filed 12/30/76; Order 75-41, § 296-32-260, filed 12/19/75.]

WAC 296-32-270 Personal climbing equipment. (1) General. Safety belts and straps shall be provided and the employer shall ensure their use when work is performed at positions more than 4 feet above ground, on poles, and on towers, except as provided in WAC 296-32-340(7)(8) of this chapter. No safety belts, safety straps or lanyards acquired after January 1, 1976, may be used unless they meet the tests set forth in chapter 296-45 WAC. The employer shall ensure that all safety belts and straps are inspected by a competent person prior to each day's use to determine that they are in safe working condition.

(2) Telecommunication Lineman's Body Belts, Safety Straps and Lanyards. (a) General requirements. (i) Hardware for lineman's body belts, safety straps and lanyards shall be drop forged or pressed steel and shall have a corrosion resistant finish tested to meet the requirements of the American Society for Testing and Materials B117-64 (50-hour test).

EXCEPTION: Lineman's body belts shall be at least four inches in width.

(3) Pole Climbers. (a) Pole climbers may not be used if the gaffs are less than 1-1/4 inches in length as measured on the underside of the gaff.

(i) The gaffs of pole climbers shall be covered with safety caps when not being used for their intended use.

(b) The employer shall ensure that pole climbers are inspected by a competent person for the following conditions: Fractured or cracked gaffs or leg irons, loose or dull gaffs, broken straps or buckles. If any of these conditions exist, the defect shall be corrected before the climbers are used.

(c) Pole climbers shall be inspected as required in this subsection before each day's use and a gaff cut-out test performed at least weekly when in use.

(d) Pole climbers shall not be worn when:

(i) Working in trees (specifically designed tree climbers shall be used for tree climbing),

(ii) Working on ladders,

(iii) Working in an aerial lift,

(iv) Driving a vehicle,

(v) Walking on rocky, hard, frozen, brushy or hilly terrain. [Order 76-38, § 296-32-270, filed 12/30/76; Order 75-41, § 296-32-270, filed 12/19/75.]

WAC 296-32-280 Ladders. (1) The employer shall ensure that no employee nor any material or equipment shall be supported or permitted to be supported on any portion of a ladder unless it is first determined, by inspections and checks conducted by a competent person that such ladder is free of defects, in good condition and secured in place.

(2) The spacing between steps or rungs permanently installed on poles and towers shall be no more than 18 inches (36 inches on any one side). This requirement also applies to fixed ladders on towers, when towers are so equipped. Spacing between steps shall be uniform above the initial unstepped section, except where working, standing, or access steps are required. Fixed ladder rungs and step rungs for poles and towers shall have a minimum diameter of 5/8 inch. Fixed ladder rungs shall have a minimum clear width of 12 inches. Steps for poles and towers shall have a minimum clear width of 4-1/2 inches. The spacing between detachable steps may not exceed 30 inches on any one side, and these steps shall be secured when in use.

(3) After October 31, 1975, portable wood ladders intended for general use shall not be painted but may be coated with a translucent nonconductive coating. Portable wood ladders shall not be longitudinally reinforced with metal.

(4) Portable wood ladders that are not being carried on vehicles and are not in active use shall be stored where they will not be exposed to the elements and where there is good ventilation.

(5) Rolling ladders used in Telecommunication Centers shall have a width between the side rails, inside to inside, of at least 12 inches.

(a) Except in working spaces that are not a means of egress, the ladders shall have a minimum inside width, between the side rails, of at least eight inches.

(6) Climbing ladders or stairways on scaffolds used for access and egress shall be affixed or built into the

scaffold by proper design and engineering, and shall be so located that their use will not disturb the stability of the scaffold. The rungs of the climbing device shall be equally spaced, but may not be less than 12 inches nominal nor more than 16 inches nominal apart. Horizontal end rungs used for platform support may also be utilized as a climbing device if such rungs meet the spacing requirement of this subsection, and if clearance between the rung and the edge of the platform is sufficient to afford a secure handhold. If a portable ladder is affixed to the scaffold, it shall be securely attached and shall have rungs meeting the spacing requirements of this subsection. Clearance shall be provided in the back of the ladder of not less than 6 inches from center of rung to the nearest scaffold structural member.

(7) When a ladder is supported by an aerial strand, and ladder hooks or other supports are not being used, the ladder shall be extended at least 2 feet above the strand and shall be secured to it (e.g. lashed or held by a safety strap around the strand and ladder side rail). When a ladder is supported by a pole, it shall be securely lashed to the pole unless the ladder is specifically designed to prevent movement when used in this application.

(8) Portable wood straight ladders, when in use, shall be equipped with safety shoes.

(9) Ladders shall be inspected by a competent person prior to each use. Ladders which have developed defects shall be withdrawn from service for repair or destruction and tagged or marked as "Dangerous Do Not Use." [Order 76-38, § 296-32-280, filed 12/30/76; Order 75-41, § 296-32-280, filed 12/19/75.]

WAC 296-32-290 Vehicle-mounted material handling devices and other mechanical equipment. (1) General. (a) The employer shall ensure that visual inspections are made of the equipment by a competent person each day the equipment is to be used to ascertain that it is in good condition.

(b) The employer shall ensure that tests shall be made at the beginning of each shift by a competent person to insure the vehicle brakes and operating systems are in proper working condition.

(2) Scrapers, Loaders, Dozers, Graders and Tractors.

(a) All mobile, self-propelled scrapers, mobile front end loaders, mobile dozers, agricultural and industrial tractors, crawler tractors, crawler-type loaders, and motor graders, with or without attachments, that are used in telecommunications work shall have rollover protective structures that meet the requirements of WAC 296-155-950 through WAC 296-155-965.

(3) Aerial Manlift Equipment. (a) These devices shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table 1 of this chapter.

(b) Only qualified drivers shall be permitted to operate aerial manlift equipment and shall possess a current motor vehicle operator's license.

(c) When performing work from aerial manlift equipment, the workman shall wear a safety belt attached to the boom.

(d) When any aerial manlift equipment is parked at the jobsite, the brakes shall be set. Wheel chocks shall be used to prevent uncontrolled movement. If equipped with outriggers, the outriggers shall be implanted on firm footing.

(e) Manufacturer's recommended maximum load limit shall be posted near each set of controls, kept in legible condition and the maximum load limit shall not be exceeded.

(f) Flashing warning lights shall be installed and maintained on all aerial manlift equipment used on public thoroughfares.

(4)(a) The operation of all motor vehicles and trailers shall be in conformance with the motor vehicle laws, the General Safety and Health Standards of the State of Washington and all local traffic ordinances.

(b) When it is necessary for the worker to work in the bucket at an elevated position with the vehicle in motion, there shall be direct communication between the worker and the vehicle operator.

(5) Derrick Trucks and Similar Equipment. (a) This equipment shall not be operated with any conductive part of the equipment closer to exposed energized power lines than the clearances set forth in Table 1 of this chapter.

(b) When derricks are used to handle poles near energized power conductors, these operations shall comply with the requirements contained in WAC 296-32-220(10) and WAC 296-32-330(11) of this chapter.

(c) Moving parts of equipment and machinery carried on or mounted on telecommunications line trucks shall be guarded. This may be done with barricades as specified in WAC 296-32-240(2) of this chapter.

(d) Derricks and the operation of derricks shall comply with the following requirements:

(i) Manufacturer's specifications, load ratings and instructions for derrick operation shall be strictly observed.

(ii) Rated load capacities and instructions related to derrick operation shall be conspicuously posted on a permanent weather-resistant plate or decal in a location on the derrick that is plainly visible to the derrick operator.

(iii) Prior to derrick operation the parking brake must be set and the stabilizers extended if the vehicle is so equipped. When the vehicle is situated on a grade, at least two wheels must be chocked on the downgrade side.

(iv) Only persons trained in the operation of the derrick shall be permitted to operate the derrick.

(v) Hand signals to derrick operators shall be those prescribed by ANSI B30.6-1969, "Safety Code for Derricks."

(vi) The employer shall ensure that the derrick and its associated equipment are inspected by a competent person at intervals set by the manufacturer but in no case less than once per year. Records shall be maintained including the dates of inspections, and necessary repairs made.

(vii) Modifications or additions to the derrick and its associated equipment that alter its capacity or affect its safe operation shall be made only with written certification from the manufacturer, or other equivalent entity,

such as a nationally recognized testing laboratory, that the modification results in the equipment being safe for its intended use. Such changes shall require the changing and posting of revised capacity and instruction decals or plates. These new ratings or limitations shall be as provided by the manufacturer or other equivalent entity.

(viii) Wire rope used with derricks shall be of improved plow steel or equivalent. Wire rope safety factors shall be in accordance with American National Standards Institute B30.6-1969.

(ix) Wire rope shall be taken out of service, or the defective portion removed, when any of the following conditions exist:

(A) The rope strength has been significantly reduced due to corrosion, pitting, or excessive heat, or

(B) The thickness of the outer wires of the rope has been reduced to two-thirds or less of the original thickness, or

(C) There are more than six broken wires in any one rope lay, or

(D) There is excessive permanent distortion caused by kinking, crushing, or severe twisting of the rope. [Order 76-38, § 296-32-290, filed 12/30/76; Order 75-41, § 296-32-290, filed 12/19/75.]

WAC 296-32-300 Materials handling and storage.

(1) Poles. (a) When working with poles in piles or stacks, work shall be performed from the ends of the poles and precautions shall be taken for the safety of employees at the other end of the pole.

(b) During pole hauling operations, all loads shall be secured to prevent displacement. Lights, reflectors and/or flags shall be displayed on the end and sides of the load.

(c) The requirements for installation, removal, or other handling of poles in pole lines are prescribed in WAC 296-32-330 which pertains to overhead lines.

(d) In the case of hoisting machinery equipped with a positive stop load-holding device, it shall be permissible for the operator to leave his position at the controls (while a load is suspended) for the sole purpose of assisting in positioning the load prior to landing it.

(e) Prior to unloading steel, poles, crossarms, and similar material, the load shall be thoroughly examined to ascertain that the load has not shifted, that binders or stakes have not broken, and that the load is not otherwise hazardous to employees.

(2) Cable Reels. Cable reels and poles in storage shall be checked or otherwise restrained to prevent uncontrollable movement.

(3) All tools and materials shall be stored in a safe and orderly manner.

(4) Workers shall not carry loose materials, tools, or equipment on or in vehicles in a manner that would constitute a hazard.

(5) All buildings, storage yards, equipment and other property shall be kept in a clean and orderly manner. [Order 76-38, § 296-32-300, filed 12/30/76; Order 75-41, § 296-32-300, filed 12/19/75.]

WAC 296-32-310 Cable fault locating and testing.

(1) Employees involved in using high voltages to locate trouble or test cables shall be instructed in the precautions necessary for their own safety and the safety of other employees.

(2) Before voltage is applied to equipment not isolated, all possible precautions shall be taken to insure that no employee can make contact with the energized conductors under test.

(3) Only trained and authorized personnel shall repair and test medium and high voltage equipment. [Order 76-38, § 296-32-310, filed 12/30/76; Order 75-41, § 296-32-310, filed 12/19/75.]

WAC 296-32-320 Grounding for employee protection—Pole lines.

(1) Power Conductors. Electric power conductors and equipment shall be considered as energized until the employee can determine that they are bonded to one of the grounds as listed in subsection (4) of this section.

(2) Nonworking Open Wire. Nonworking open wire communications lines shall be bonded to one of the grounds listed in subsection (4) of this section.

(3) Vertical Power Conduit, Power Ground Wires and Street Light Fixtures. (a) Metal power conduit on joint use poles, exposed vertical power ground wires, and street light fixtures which are below communications attachments or less than 20 inches above these attachments, shall be considered energized and shall be tested for voltage unless the employee can visually determine that they are bonded to the communications suspension strand or cable sheath.

(b) If no hazardous voltage is shown by the voltage test, a temporary bond shall be placed between such street light fixture, exposed vertical power grounding conductor, or metallic power conduit and the communications cable strand. Temporary bonds used for this purpose shall have sufficient conductivity to carry at least 500 amperes for a period of one second without fusing.

(4) Protective Grounding. Acceptable grounds for protective grounding are as follows:

(a) A vertical ground wire which has been tested, found safe, and is connected to a power system multigrounded neutral or the grounded neutral of a power secondary system where there are at least three services connected;

(b) Communications cable sheath or shield and its supporting strand where the sheath or shield is:

(i) Bonded to an underground or buried cable which is connected to a central office ground, or

(ii) Bonded to an underground metallic piping system, or

(iii) Bonded to a power system multigrounded neutral or grounded neutral of a power secondary system which has at least three services connected;

(c) Guys which are bonded to the grounds specified in subdivisions (a) and (b) of this subsection and which have continuity uninterrupted by an insulator; and

(d) If all of the preceding grounds are not available, arrays of driven ground rods where the resultant resistance to ground will be low enough to eliminate danger

to personnel or permit prompt operation of protective devices.

(5) Attaching and Removing Temporary Bonds. When attaching grounds (bonds), the first attachment shall be made to the protective ground. When removing bonds, the connection to the line or equipment shall be removed first. Insulating gloves shall be worn during these operations.

(6) Temporary Grounding of Suspension Strand. (a) The suspension strand shall be grounded to the existing grounds listed in subsection (4) of this section when being placed on jointly used poles.

(b) Where power crossings are encountered on non-joint lines, the strand shall be bonded to an existing ground listed in subsection (4) of this section as close as possible to the crossing. This bonding is not required where crossings are made on a common crossing pole unless there is an upward change in grade at the pole.

(c) Where traveling roller-type bonds are used, they shall be restrained so as to avoid stressing the electrical connections.

(d) Bonds between the suspension strand and the existing ground shall be at least No. 6AWG copper.

(e) Temporary bonds shall be left in place until the strand has been tensioned, dead-ended, and permanently grounded.

(f) The requirements of subdivision (a) through (e) of this subsection do not apply to the installation of insulated strand.

(7) Antenna Work—radio Transmitting Stations 3-30 MHZ.

(a) Prior to grounding a radio transmitting station antenna, the employer shall insure that the rigger is in charge:

(i) Prepares a danger tag signed with his signature,

(ii) Requests the transmitting technician to shutdown the transmitter and to ground the antenna with its grounding switch,

(iii) Is notified by the transmitting technician that the transmitter has been shutdown, and

(iv) Tags the antenna ground switch personally in the presence of the transmitting technician after the antenna has been grounded by the transmitting technician.

(b) Power shall not be applied to the antenna, nor shall the grounding switch be opened under any circumstances while the tag is affixed.

(c)(i) Where no grounding switches are provided, grounding sticks shall be used, one on each side of line, and tags shall be placed on the grounding sticks, antenna switch, or plate power switch in a conspicuous place.

(ii) To further reduce excessive radio frequency pickup, ground sticks or short circuits shall be placed directly on the transmission lines near the transmitter in addition to the regular grounding switches.

(iii) In other cases, the antenna lines may be disconnected from ground and the transmitter to reduce pickup at the point in the field.

(d) All radio frequency line wires shall be tested for pickup with an insulated probe before they are handled either with bare hands or with metal tools.

(e) The employer shall insure that the transmitting technician warn the riggers about adjacent lines which are, or may become energized.

(f) The employer shall insure that when antenna work has been completed, the rigger in charge of the job returns to the transmitter, notifies the transmitting technician in charge that work has been completed, and personally removes the tag from the antenna ground switch. [Order 76-38, § 296-32-320, filed 12/30/76; Order 75-41, § 296-32-320, filed 12/19/75.]

WAC 296-32-330 Overhead lines. (1) Handling Suspension Strand. (a) The employer shall insure that when handling cable suspension strand which is being installed on poles carrying exposed energized power conductors, employees shall wear insulating gloves and shall avoid body contact with the strand until after it has been tensioned, dead-ended and permanently grounded.

(b) The strand shall be restrained against upward movement during installation:

(i) On joint-use poles, where there is an upward change in grade at the pole, and

(ii) On non-joint-use poles, where the line crosses under energized power conductors.

(2) Need for Testing Wood Poles. Unless temporary guys or braces are attached, the following poles shall be tested in accordance with subsection (3) of this section and determined to be safe before employees are permitted to climb them:

(a) Dead-end poles, except properly braced or guyed "Y" or "T" cable junction poles,

(b) Straight line poles which are not storm guyed and where adjacent span lengths exceed 165 feet.

(c) Poles at which there is a downward change in grade and which are not guyed or braced corner poles or cable junction poles.

(d) Poles which support only telephone drop wire, and

(e) Poles which carry less than ten communication line wires. On joint use poles, one power line wire shall be considered as two communication wires for purposes of this subdivision(2)(e).

(3) Methods for Testing Wood Poles. The following method or an equivalent method shall be used for testing wood poles:

(a) Rap the pole sharply with a lineman's hammer, starting near the ground line and continuing upwards circumferentially around the pole to a height of approximately 6 feet. The hammer will produce a clear sound and rebound sharply when striking sound wood. Decay pockets will be indicated by a dull sound and/or a less pronounced hammer rebound. When decay pockets are indicated, the pole shall be considered unsafe.

(b) The pole shall be prodded as near the ground line as possible using a pole prod or a screwdriver with a single blade at least five (5) inches long.

(c) If the pole is found unsafe, it shall be guyed or braced or supported in such a manner as to allow workers to safely perform their work.

(4) Unsafe Poles or Structures. (a) Poles or structures determined to be unsafe by test or observation may not be climbed until made safe by guying, bracing or other means.

(b) Poles determined to be unsafe to climb shall, until they are made safe, be marked in a conspicuous place to alert and warn all employees of the unsafe condition.

(5) Test Requirements for Cable Suspension Strand.

(a) Before attaching a splicing platform to a cable suspension strand, the strand shall be tested and determined to have strength sufficient to support the weight of the platform and the employee. Where the strand crosses above power wires or railroad tracks it may not be tested but shall be inspected in accordance with subsection (6) of this section.

(b) The following method or an equivalent method shall be used for testing the strength of the strand: A rope, at least three-eighths [eighths] inches in diameter, shall be thrown over the strand. On joint lines, the rope shall be passed over the strand using tree pruner handles or a wire raising tool. If two employees are present, both shall grip the double rope and slowly transfer their entire weight to the rope and attempt to raise themselves off the ground. If only one employee is present, one end of the rope which has been passed over the strand shall be tied to the bumper of the truck, or other equally secure anchorage. The employee then shall grasp the other end of the rope and attempt to raise himself off the ground.

(6) Inspection of Strand. Where strand passes over electric power wires or railroad tracks, it shall be inspected from an elevated working position at each pole supporting the span in question. The strand may not be used to support any splicing platform, scaffold or cable car, if any of the following conditions exist:

(a) Corrosion so that no galvanizing can be detected,

(b) One or more wires of the strand are broken,

(c) Worn spots, or

(d) Burn marks such as those caused by contact with electric power wires.

(7) Outside Work Platforms. Unless railings are provided, safety straps and body belts shall be used while working on elevated work platforms such as aerial splicing platforms, pole platforms, ladder platforms and terminal balconies.

(8) Other Elevated Locations. Safety straps and body belts shall be worn when working at elevated positions on poles, towers or similar structures, which do not have guarded work areas.

(9) Installing and Removing Wire and Cable. Before installing or removing wire or cable, the pole or structure shall be guyed, braced, or otherwise supported, as necessary, to prevent failure of the pole or structure.

(10) Avoiding Contact With Energized Power Conductors or Equipment. When cranes, derricks, or other mechanized equipment are used for setting, moving, or removing poles, all necessary precautions shall be taken to avoid contact with energized power conductors or equipment.

(11) Handling Poles Near Energized Power Conductors.

(a) Joint use poles may not be set, moved, or removed where the nominal voltage of open electrical power conductors exceeds 34.5 kV phase to phase or 20 kV phase to ground.

(b) Poles that are to be placed, moved or removed during heavy rains, sleet or wet snow in joint lines carrying more than 8.7 kV phase to phase voltage or 5 kV phase to ground shall be guarded or otherwise prevented from direct contact with overhead energized power conductors.

(c)(i) In joint lines where the power voltage is greater than 750 volts but less than 34.5 kV phase to phase or 20 kV phase to ground, wet poles being placed, moved or removed shall be insulated with either a rubber insulating blanket, a fiberglass box guide, or equivalent protective equipment.

(ii) In joint lines where the power voltage is greater than 8.7 kV phase to phase or 5 kV phase to ground but less than 34.5 kV phase to phase or 20 kV phase to ground, dry poles being placed, moved, or removed shall be insulated with either a rubber insulating blanket, a fiberglass box guide, or equivalent protective equipment.

(iii) Where wet or dry poles are being removed, insulation of the pole is not required if the pole is cut off 2 feet or more below the lowest power wire and also cut off near the ground line.

(d) Insulating gloves shall be worn when handling the pole with either hands or tools, when there exists a possibility that the pole may contact a power conductor. Where the voltage to ground of the power conductor exceeds 15 kV to ground, Class II gloves (as defined in ANSI J6.6-1971) shall be used. For voltages not exceeding 15 kV to ground, insulating gloves shall have a breakdown voltage of at least 17 kV.

(e) The guard or insulating material used to protect the pole shall meet the appropriate 3 minute proof test voltage requirements contained in the ANSI J6.4-1971.

(f) When there exists a possibility of contact between the pole or the vehicle-mounted equipment used to handle the pole, and an energized power conductor, the following precautions shall be observed:

(i) When on the vehicle which carries the derrick, avoid all contact with the ground, with persons standing on the ground, and with all grounded objects such as guys, tree limbs, or metal sign posts. To the extent feasible, remain on the vehicle as long as the possibility of contact exists.

(ii) When it is necessary to leave the vehicle, step onto an insulating blanket and break all contact with the vehicle before stepping off the blanket and onto the ground. As a last resort, if a blanket is not available, the employee may jump cleanly from the vehicle.

(iii) When it is necessary to enter the vehicle, first step onto an insulating blanket and break all contact with the ground, grounded objects and other persons before touching the truck or derrick.

(12) Working Position on Poles. Climbing and working are prohibited above the level of the lowest electric power conductor on the pole (exclusive of vertical runs and street light wiring), except:

(a) Where communications facilities are attached above the electric power conductors, and a rigid fixed barrier is installed between the electric power facility and the communications facility, or

(b) Where the electric power conductors are cabled secondary service drops carrying less than 300 volts to

ground and are attached 40 inches or more below the communications conductors or cables.

(13) Metal Tapes and Ropes. (a) Metal measuring tapes, metal measuring ropes, or tapes containing conductive strands shall not be used when working near exposed energized parts.

(b) Where it is necessary to measure clearances from energized parts, only nonconductive devices shall be used. [Order 76-38, § 296-32-330, filed 12/30/76; Order 75-41, § 296-32-330, filed 12/19/75.]

WAC 296-32-340 Underground lines and cable vaults. The provisions of this section apply to the guarding of manholes and street openings, and to the ventilation and testing for gas in manholes and unvented vaults, where telecommunications field work is performed on or with underground lines.

(1) Guarding Manholes and Street Openings. (a) When covers of manholes or vaults are removed, the opening shall be promptly guarded by a railing, temporary cover, or other acceptable temporary barrier to prevent an accidental fall through the opening and to protect employees working in the manhole from foreign objects entering the manhole.

(b) When work is to be performed on underground plant, the immediate foreman in charge and the craftsman assigned to do the work shall make a complete evaluation of the work location in regard to the hazards that are created or that could exist prior to beginning the work in underground plant.

(c) The immediate foreman and the craftsman responsible for the job completion shall be in agreement of the proper method of eliminating or reducing any hazards that are present or could be caused by the location of the work site, before the job proceeds.

(2) Requirements Prior to Entry of Manholes and Unvented Vaults.

(a) The internal atmosphere shall be tested for combustible gas.

(b) Mechanical forced air ventilation shall be in operation at all times when workers are required to be in the manhole.

(c) The mechanical forced air equipment provided shall be of a quantity to replace the exhausted air and shall be tempered when necessary.

(d) Ventilation equipment shall be designed in such a manner that workers will not be subjected to excessive air velocities.

(3) Joint Power and Telecommunication Manholes. While work is being performed in a manhole occupied jointly by an electric utility and a telecommunication utility, an employee with basic first aid training shall be available in the immediate vicinity to render emergency assistance as required. This employee is not to be precluded from occasionally entering a manhole to provide assistance other than in an emergency. The requirement of WAC 296-32-340(3) does not preclude a qualified employee, working alone, from entering for brief periods of time, a manhole where energized cables or equipment are in service, for the purpose of inspection, housekeeping, taking readings, or similar work if such work can be performed safely.

(4) Ladders. (a) Ladders shall be used to enter and exit manholes exceeding four feet in depth.

(b) Metal manhole ladders shall be free of structural defects and free of accident hazards such as sharp edges and burrs. The metal shall be protected against corrosion unless inherently corrosion-resistant.

(c) These ladders may be designed with parallel side rails, or with side rails varying uniformly in separation along the length (tapered) or with side rails flaring at the base to increase stability.

(d) The spacing of rungs or steps shall be on 12-inch centers.

(e) Connections between rungs or steps and side rails shall be constructed to ensure rigidity as well as strength.

(f) Rungs and steps shall be corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping.

(g) Ladder hardware shall meet the ladder's component parts and shall be of a material that is protected against corrosion unless inherently corrosion-resistant. Metals shall be so selected as to avoid excessive galvanic action.

(5) Flames. When open flames must be used in manholes, the following precautions shall be taken to protect against the accumulation of combustible gas:

(a) A test for combustible gas shall be made immediately before using any open flame device, and

(b) A fuel tank (e.g., acetylene) may not be in the manhole unless in actual use. [Order 76-38, § 296-32-340, filed 12/30/76; Order 75-41, § 296-32-340, filed 12/19/75.]

WAC 296-32-350 Microwave transmission. (1) Eye protection. Employers shall insure that employees do not look into an open waveguide which is connected to an energized source of microwave radiation.

(2) Hazardous Area. Accessible areas associated with microwave communication systems where the electromagnetic radiation level exceeds the radiation protection guide given in WAC 296-62-09005 shall be posted as described in that section. The lower half of the warning symbol shall include the following:

Radiation in this area may exceed hazard limitations and special precautions are required. Obtain specific instruction before entering.

(3) Protective Measures. When an employee works in an area where the electromagnetic radiation exceeds the radiation protection guide, the employer shall institute measures that insure that the employee's exposure is not greater than that permitted by the radiation guide. Such measures shall include, but not be limited to those of an administrative or engineering nature or those involving personal protective equipment. [Order 76-38, § 296-32-350, filed 12/30/76; Order 75-41, § 296-32-350, filed 12/19/75.]

WAC 296-32-360 Tree trimming—Electrical hazards. (1) General.

(a) Employees engaged in pruning, trimming, removing, or clearing trees from lines shall be required to consider all overhead and underground electrical power conductors to be energized with potentially fatal voltages, never to be touched (contacted) either directly or indirectly.

(b) Employees engaged in line-clearing operations shall be instructed that:

(i) A direct contact is made when any part of the body touches or contacts an energized conductor, or other energized electrical fixture or apparatus.

(ii) An indirect contact is made when any part of the body touches any object in contact with an energized electrical conductor, or other energized fixture or apparatus.

(iii) An indirect contact can be made through conductive tools, tree branches, truck equipment, or other objects, or as a result of communications wires, cables, fences, or guy wires being accidentally energized.

(iv) Electric shock will occur when an employee, by either direct or indirect contact with an energized conductor, energized tree limb, tool, equipment, or other object, provides a path for the flow of electricity to a grounded object or to the ground itself. Simultaneous contact with two energized conductors will also cause electric shock which may result in serious or fatal injury.

(c) Before any work is performed in proximity to energized conductors, the system operator/owner of the energized conductors shall be contacted to ascertain if he knows of any hazards associated with the conductors which may not be readily apparent. This rule does not apply when operations are performed by the system operator/owner.

(2) Working in Proximity to Electrical Hazards. (a) Employers shall ensure that a close inspection is made by the employee and by the foreman or supervisor in charge before climbing, entering, or working around any tree, to determine whether an electrical power conductor passes through the tree, or passes within reaching distance of an employee working in the tree. If any of these conditions exist either directly or indirectly, an electrical hazard shall be considered to exist unless the system operator/owner has caused the hazard to be removed by deenergizing the lines, or installing protective equipment.

(b) Only employees or trainees, familiar with the special techniques and hazards involved in line clearance, shall be permitted to perform the work if it is found that an electrical hazard exists.

(c) During all tree working operations aloft where an electrical hazard of more than 750 volts exists, there shall be a second employee or trainee qualified in line clearance tree trimming within normal voice communication.

(d) Where tree work is performed by employees qualified in line-clearance tree trimming and trainees qualified in line-clearance tree trimming, the clearances from energized conductors given in Table 2 shall apply.

TABLE 2

Minimum Working Distances From Energized Conductors For Line-Clearance Tree Trimmers and Line-Clearance Tree-Trimner Trainees

Voltage Range (Phase to Phase) (kilovolts)	Minimum Working Distance
2.1 to 15.0 _____	2 ft. 0 in.
15.1 to 35.0 _____	2 ft. 4 in.
35.1 to 46.0 _____	2 ft. 6 in.
46.1 to 72.5 _____	3 ft. 0 in.
72.6 to 121.0 _____	3 ft. 4 in.
138.0 to 145.0 _____	3 ft. 6 in.
161.0 to 169.0 _____	3 ft. 8 in.
230.0 to 242.0 _____	5 ft. 0 in.
345.0 to 362.0 _____	7 ft. 0 in.
500.0 to 552.0 _____	11 ft. 0 in.
700.0 to 765.0 _____	15 ft. 0 in.

(e) Branches hanging on an energized conductor may only be removed using insulated equipment by a qualified electrical worker.

(f) Rubber footwear, including lineman's overshoes, shall not be considered as providing any measure of safety from electrical hazards.

(g) Ladders, platforms, and aerial devices, including insulated aerial devices, shall not be brought in contact with an electrical conductor. Reliance shall not be placed on their dielectric capabilities.

(h) When an aerial lift device contacts an electrical conductor, the truck supporting the aerial lift device shall be considered as energized.

(3) Storm Work and Emergency Conditions. (a) Since storm work and emergency conditions create special hazards, only authorized representatives of the electric utility system operator/owner and not telecommunication workers may perform tree work in these situations where energized electrical power conductors are involved.

(b) When an emergency condition develops due to tree operations, work shall be suspended and the system operator/owner shall be notified immediately. [Order 76-38, § 296-32-360, filed 12/30/76; Order 75-41, § 296-32-360, filed 12/19/75.]

WAC 296-32-370 Buried facilities—Communications lines and power lines in the same trench. [Reserved.]

Chapter 296-36 WAC

SAFETY STANDARDS—COMPRESSED AIR WORK

WAC

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WAC 296-36-010 Definitions. As used herein, the following terms mean: (1) **Approved.** In compliance with a subsisting resolution of approval adopted by the department of labor and industries, division of safety.

(2) **Adequate.** The term when applied to materials, devices, structures, methods and procedures is synonymous with effective, equal, equivalent, firm, necessary, proper, safe, secure, substantial, sufficient, suitable and shall denote such kind and quality as a reasonable and prudent man experienced in compressed air work would

require in order to provide safe working conditions for himself in the performance of the work.

(3) **Bulkhead.** An upright partition in tunnels separating compartments; a structure or partition capable of resisting pressure and separating a high pressure compartment from a low pressure compartment.

(4) **Caisson.** A structure in or by means of which excavation in a predominantly vertical direction is carried on by persons working in a compressed air environment.

(5) **Compressed air worker.** A person performing any work or duty in compressed air. This term does not include divers.

(6) **Designated person.** A person selected and directed by an employer to perform a specified task or duty.

(7) **Director.** The director of the department of labor and industries, state of Washington.

(8) **Effective, equal, equivalent.** See (2), "Adequate".

(9) **Firm.** See (2), "Adequate".

(10) **Job.** The site, buildings, equipment and operations proximately associated with the work in compressed air.

(11) **Lock.** A chamber designed to facilitate the passage of men, materials and equipment from one ambient air pressure to another ambient air pressure.

(a) **Emergency lock.** A lock chamber designed to hold and to permit the quick passage of an entire shift of compressed air workers.

(b) **Man lock.** A lock chamber through which only men pass.

(c) **Materials lock.** A lock chamber designed and used normally for the passage of materials and equipment.

(d) **Medical lock.** A special lock chamber in which men suffering from decompression illness are placed for medical attention and treatment. Also used as a facility for preemployment physical examinations.

(12) **Necessary.** See (2), "Adequate".

(13) **Owner.** The person, real or corporate, for whom the construction is being done.

(14) **Pressure.**

(a) **Absolute.** Gage pressure plus one atmosphere; viz, at sea level with a gage pressure of 30 pounds per square inch, the absolute pressure is $30+14.7=44.7$ pounds per square inch.

(b) **Ambient.** That which encompasses on all sides, surrounds. Usually taken as the gage pressure.

(c) **Atmospheric.** A pressure of one atmosphere at sea level; the pressure of air at sea level, used as a unit of measurement, equivalent to 14.7 pounds per square inch. One atmosphere of pressure is also zero pounds per square inch gage pressure.

(d) **Gage.** That pressure measured by gage and indicating the pressure in pounds per square inch exceeding one atmosphere.

(e) **Normal.** Atmospheric pressure of 14.7 pounds per square inch at sea level or zero gage pressure.

(f) **Total.** Total pressure is a pressure of one atmosphere plus gage pressure. See (14)(a), "Absolute".

(15) **Safe, secure.** See (2), "Adequate".

(16) **Shaft.** An excavation made from the surface of the ground the longer of axis of which forms an angle with the horizontal greater than twenty degrees.

(17) **Shafting.** An air and watertight enclosure built in the roof of a caisson and extended upward until above the ground or water level.

(18) **Shall.** The word "shall" is always mandatory.

(19) **Substantial, sufficient, suitable.** See (2), "Adequate".

(20) **Supervisor.** The supervisor of safety, department of labor and industries, state of Washington.

(21) **Tunnel.** The underground excavation for a passageway including all shafts and other openings leading to or from such excavation, and all places, buildings and equipment used in connection therewith. Tunnels which are administered as distinct units constitute separate jobs.

(22) **Working chamber.** The space or compartment in which the excavating is being done in compressed air. [Rule I, filed 12/28/62; Part One (Definitions), filed 3/23/60.]

WAC 296-36-020 Responsibility. (1) **The owner's responsibility.** There shall be on every job involving work in compressed air an owner's representative who shall be experienced in compressed air work and who shall represent the owner in all matters of joint responsibility under the Washington labor laws and the standards of safety for the work. The owner shall advise the director of the department of labor and industries in writing of the name and address of each such representative within 24 hours after starting work on the job.

(2) **The superintendent.** There shall be on every job, while work in compressed air is in progress, a superintendent experienced in compressed air work representing the employer of compressed air workers and who shall be in full charge of the job. The employer shall advise the director of the department of labor and industries in writing of the name and address of each such superintendent within 24 hours after starting work on the job.

(3) **Employees' responsibilities.** Every employee shall be responsible for carrying out all rules which immediately concern or affect his conduct and he shall use the safety devices and means furnished for his protection. [Rules (Part II A, B, & C), filed 12/28/62; § 22, filed 3/23/60.]

WAC 296-36-030 General operating requirements—General duty to provide safety. Every reasonable precaution shall be taken to insure the safety of the workmen whether provided herein or not. [Rules (Part III A), filed 12/28/62.]

WAC 296-36-035 General operating requirements—Safety miner. (1) A safety miner shall be selected by the crew on each shift. He shall have at least five years' experience as a practical miner and shall be the holder of an unexpired first-aid certificate from the Red Cross, U.S. bureau of mines, or the department of labor and industries. His duties shall be to check conditions to eliminate common work hazards such as loose rock, faulty timbers, poor rails, insufficient lighting, defective ladders and scaffolds, fan pipes, firing lines and other equipment directly related to the work of a miner.

If such defects are found he shall immediately report the same to the superintendent.

(2) It shall be the duty of the superintendent, upon ascertaining such defects or hazards, to take immediate steps to remedy the same in compliance with the rules hereinafter set forth. A record of inspections made on each operation shall be kept on file and a copy thereof shall be submitted to the safety division of the department of labor and industries.

(3) In the event that disagreement arises out of the interpretation of these rules, then the question shall be referred to the division of safety of the department of labor and industries for its decision in accordance with the laws of the state, the safety standards, or rules and regulations issued hereunder, and a decision thus rendered shall be binding. [Rules (Part III B), filed 12/28/62; § 15, filed 3/23/60.]

WAC 296-36-040 General operating requirements—Maintenance. All machinery, equipment, appliances, materials, structures and places on the job shall at all times be maintained in a safe condition and in good repair. Every person observing any defects shall immediately advise his immediate or higher superior. [Rules (Part III C), filed 12/28/62; Rule 2203, § 22, filed 3/23/60.]

WAC 296-36-045 General operating requirements—Daily inspection. While work in compressed air is in progress, a competent person designated by the superintendent shall make a regular inspection at least once every day of all machinery, equipment, appliances, structures and places. Immediately upon discovery of any defect, he shall report the same in writing on forms provided by the state department of labor and industries to the person present in charge of the job. A copy of the report shall be sent immediately to the safety division of the department of labor and industries. [Rules (Part III D), filed 12/28/62.]

WAC 296-36-050 General operating requirements—Maximum permissible pressure. No person shall be subjected to pressure exceeding 50 pounds per square inch gage except in case of emergency. [Rules (Part III E), filed 12/28/62; § 1, filed 3/23/60.]

WAC 296-36-055 General operating requirements—Temperature in working chamber. Every effort shall be made by the best available means to prevent the wet bulb temperature exceeding 80 degrees F. A wet bulb thermometer, in good working order, shall be provided in every working chamber. [Rules (Part III F), filed 12/28/62; § 20, Rule 2006, filed 3/23/60.]

WAC 296-36-060 General operating requirements—Bracing of working chamber, shafts and passageways. The working chamber, shafts and passageways of tunnels and caissons shall be provided with bracing as may be necessary to safely resist any superimposed loads or any forces which may cause excessive deformation of the walls. [Rules (Part III G), filed 12/28/62; § 19, filed 3/23/60.]

WAC 296-36-065 General operating requirements—Communication. A telephone intercommunication system ready for use at all times shall be maintained between the working chamber, the power house, the source of compressed air, the place of compressed air control, the first-aid room and the superintendent's office. **Exception:** Where the working chamber of a caisson is less than 150 square feet in area, such system shall be maintained between the working chamber, outside the lock and the place of compressed air control or the superintendent's office. [Rules (Part III H), filed 12/28/62; § 8, filed 3/23/60.]

WAC 296-36-070 General operating requirements—Liquor. No person under the influence of intoxicating liquor shall be permitted to enter upon the job; nor shall any person carry any liquor on the job. [Rules (Part III I), filed 12/28/62; § 24, Rule 2402, filed 3/23/60.]

WAC 296-36-075 General operating requirements—Identification badge. Every compressed air worker employed in the work shall wear an identification badge furnished by the employer both on and off the job. The badge shall be of durable plastic designed to be worn next to the body. The badge shall state that the wearer is employed as a compressed air worker, shall bear the address and telephone number of the medical lock, and shall contain instructions that in case of an emergency of unknown or doubtful cause or illness, the wearer shall be rushed to the medical facilities and not to a hospital. [Rules (Part III J), filed 12/28/62; § 24, Rule 2412, filed 3/23/60.]

WAC 296-36-080 General operating requirements—Notification of civil authorities, hospitals, etc. When workmen are employed in compressed air, the owner shall see that all general hospitals, city and county health departments, local medical societies, police and fire rescue, and the county sheriff in the locality are acquainted with the fact that such work is being undertaken. These authorities and organizations shall be furnished with the names, addresses and telephone numbers of the designated medical officers as well as the location and telephone number of the medical lock. The same civil authorities shall be further notified when compressed air operations on the site are completed. [Rules (Part III K), filed 12/28/62.]

WAC 296-36-085 General operating requirements—Instructions to be posted. The following instructions as well as supplemental instructions deemed advisable by the medical officer for the guidance of compressed air workers shall be printed and conspicuously posted in the change house and in the man locks:

- (1) Never go on shift with an empty stomach.
- (2) Avoid all alcoholic liquors.
- (3) Eat moderately.
- (4) Sleep at least seven hours daily.
- (5) Take extra outer clothing into the tunnel when going on shift and wear it during decompression to avoid chilling during that period.

- (6) Take a warm bath after each shift.
- (7) Do not give men, suffering from compressed air illness, any intoxicating liquor.
- (8) After you have had a cold, or if your ears are uncomfortable, or if you do not feel well for any reason, report at once to the medical lock for a checkup.
- (9) If you are taken sick away from the plant, communicate at once with the physician-in-charge, Dr. -----, telephone -----.
- (10) Wear your identification badge so it will be known what to do with you in an emergency.
- (11) See that you are reexamined as required by the rules.
- (12) Proper decompression means safety and freedom from compressed air illness.
- (13) No person shall smoke or carry lighted smoking materials in compressed air. No matches, mechanical or chemical igniters will be permitted in the working chamber except those necessary for welding or flame cutting operations.
- It shall be the duty and responsibility of each employee to observe and abide by the posted instructions and regulations. [Rules (Part III L), filed 12/28/62; Rule 2204, filed 3/23/60.]

WAC 296-36-100 Compression and decompression of workmen—General. Subject to subsections 1-5 below, compression and decompression of workmen shall be carried out in accordance with the rules hereinafter prescribed:

- (1) Compression or decompression may be carried out in accordance with such alternative regulations as are approved by the state department of labor and industries in writing.
- (2) Except in an emergency, no workman shall be compressed to a pressure exceeding 50 pounds per square inch gage unless regulations for the decompression of such workman have been approved under the foregoing paragraph of this rule.
- (3) The monograph "Decompression sickness and its prevention among compressed air workers" prepared by Gerald J. Duffner, M.D. (Captain, medical corps, U.S. Navy) and dated 6 November 1962, establishes the criteria for and shall be the guide in the determination of decompression methods and procedures and the preparation of decompression tables. Copies of the monograph are available from the supervisor of safety, department of labor and industries, state of Washington.
- (4) A special low-pressure decompression chamber of sufficient size to accommodate the entire force of workmen being decompressed at the end of a shift shall be provided under the following circumstances:

Excepting the infrequent, occasional or emergency condition, when any regularly established routine term or schedule of work includes a working period requiring a total time of decompression exceeding seventy-five minutes, the special low-pressure decompression chamber shall be provided and shall be used as a facility to accomplish the final stage or phase of decompression. The special chamber shall conform with and shall be operated in accordance with sections WAC 296-36-130 and 296-36-120(2) example No. 2 respectively.

- (5) When a workman has, within the immediately preceding period of 8 hours, been exposed to a pressure greater than 13 pounds per square inch gage and has to be compressed in a man lock other than the lock in which he was last decompressed, he shall, before compression, produce to the lock attendant written particulars signed by the lock attendant of the lock where he was last decompressed indicating his last working period. For the purposes of these regulations, the term "working period" shall mean the period or the sum of the periods during which, since last subject to ordinary atmospheric pressure for at least 8 consecutive hours, a workman has been under pressure in a working chamber or chambers; the written particulars shall be specific in stating the length of time the workman was exposed to compressed air, the gage pressure to which he was subjected, the schedule of decompression used, the total length of time devoted to decompression procedures and the hour at which decompression was completed. As soon as practicable, all data shall be entered in the prescribed register or log at the lock where he is compressed and the data shall, as soon as practicable, be communicated to the attendant at any other lock from which the workman is liable to return to the open air. [Rules (Part IV A), filed 12/28/62; § 2, filed 3/23/60.]

WAC 296-36-105 Compression and decompression of workmen—Compression. During the compression of workmen, the pressure shall not, in the first minute after starting compression, be increased to more than 3 pounds per square inch gage. When the pressure of 3 pounds per square inch gage is reached, the pressure shall not be further increased until after the lapse of a period sufficiently long to enable the lock attendant to ascertain whether any workman in the man lock complains of discomfort. After the lapse of that period, the pressure shall not be increased at a rate faster than 10 pounds per square inch gage per minute and a pause similar to that provided at 3 pounds per square inch gage shall also be provided at a pressure not exceeding 7 pounds per square inch gage. In all instances the pressure shall be increased gradually so as to insure, as far as practicable, that no workman suffers discomfort. If a workman complains of discomfort, and such complaint is signified to the lock attendant, any compression then proceeding shall be immediately stopped, and, unless the workman who has complained of the discomfort reports within 5 minutes that the discomfort has ceased and such report is conveyed to the lock attendant, the lock attendant shall without further delay gradually reduce the pressure in the lock until the workman reports that the discomfort has ceased; but, if he does not so report, the pressure shall be reduced gradually to atmospheric pressure and the workman released from the lock. [Rules (Part IV B), filed 12/28/62.]

WAC 296-36-110 Compression and decompression of workmen—Decompression—General. (1) **Working period.** The "working period" shall include the time or period or the sum of periods during which, since last subject to ordinary atmospheric pressure for at least 8

consecutive hours, a workman has been under pressure in a working chamber or chambers.

(2) **Work pressure.** The "work pressure" means the highest pressure to which the workman has been exposed in the course of his working period: *Provided*, That,

(a) Sudden and exceptional variations of pressure involving excess pressure for not more than 15 minutes may be disregarded;

(b) Where, during the whole of his working period a workman about to be decompressed has been in a working chamber in which (as in tidal waters) the pressure has been gradually varied by more than 5 pounds per square inch in the course of that period, the work pressures shall be the mean of the pressures half way through that period and at the end of it.

(3) **Decompression required.** No person employed in compressed air shall be permitted to pass from the place in which the work is being done to atmospheric pressure, except after decompression in accordance with the procedures hereinafter established. [Rules (Part IV C), filed 12/28/62; §§ 1 and 2, filed 3/23/60.]

WAC 296-36-115 Compression and decompression of workmen—Method and procedure. Decompressions shall be accomplished in accordance with the following methods and procedures: (1) **Normal condition.** A normal condition is 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 8 consecutive hours of exposure to normal atmospheric pressure has elapsed since the workman has been under pressure in a working chamber. Decompression for normal condition shall be in accordance with the decompression tables.

(2) **Multiple exposures or emergency conditions.** The appointed physician shall be responsible for the preparation and establishment of methods and procedures of decompression applicable to multiple exposures and emergency conditions. The decompression times and stages shall be calculated and the methods and procedures determined and placed into effect in accordance with the instructions contained in the monograph "Decompression sickness and its prevention among compressed air workers" referred to in WAC 296-36-100(3). [Rules (Part IV D), filed 12/28/62.]

WAC 296-36-120 Compression and decompression of workmen—Decompression tables. (1) Explanation.

(a) The decompression tables are computed for working chamber pressures from 14 to 50 pounds per square inch gage inclusive by 2 pound increments and for exposure times for each pressure extending from 1/2 to over 8 hours inclusive. Decompressions will be conducted by two or more stages with a maximum of 4 stages, the latter for a working chamber pressure of 40 pounds per square inch gage or over.

(b) 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 of 5 pounds per minute.

(c) 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 one pound per minute.

(d) 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.

(e) Decompression table No. 2 in several sheets indicates for the same various combinations of working chamber pressure and exposure time the following:

- (i) The number of stages required;
- (ii) The reduction in pressure and the terminal pressure for each required stage;
- (iii) The time in minutes through which the reduction in pressure is accomplished for each required stage;
- (iv) 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.

(2) **Examples.**

(a) Example No. 1. 4 hour working period at 20 pounds gage.

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:
$$\frac{16}{5} = 3 \text{ minutes}$$

Stage 2 (Final stage)
Reduce pressure at a uniform rate from 4 pounds to zero pounds gage over a period of 40 minutes.
Rate = 0.10 pounds per minute or 10.00 minutes per pound
Stage 2 (Final) elapsed time 40 minutes

Total time 43 minutes

(b) 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,
 $\frac{16}{5} = 3$ 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 zero pounds gage over a period of 110 minutes.
 Rate, 0.037 pounds per minute or 27.5 minutes per pound
 Stage 3 (Final stage) Elapsed time 110 minutes
 Total time 117 minutes

(3)

DECOMPRESSION TABLE NO. 1

Work Pressure psig	Total Decompression Time - Minutes											
	Working Period Hours											
	1/2	1	1-1/2	2	3	4	5	6	7	8	Over 8	
0-14	6	6	6	6	6	6	6	6	6	16	16	32
16	7	7	7	7	7	7	17	33	48	48	63	
18	7	7	7	3	11	17	48	63	63	73	87	
20	7	7	8	15	15	43	63	73	83	103	113	
22	9	9	16	24	38	68	93	103	113	128	133	
24	11	12	23	27	52	92	117	122	127	137	151	
26	13	14	29	34	69	104	126	141	142	142	163	
28	15	23	31	41	98	127	143	153	153	165	183	
30	17	28	38	62	105	143	165	168	173	188	204	
32	19	35	43	85	126	163	178	193	203	213	226	
34	21	39	58	98	151	178	195	218	223	233	248	
36	24	44	63	113	170	198	223	233	243	253	273	
38	28	49	73	128	178	203	223	238	253	263	278	
40	31	49	84	143	183	213	233	248	258	268	288	
42	37	56	102	144	189	215	245	260	263	268	293	
44	43	64	118	154	199	234	254	264	269	269	293	
46	44	74	139	171	214	244	269	274	289	299	318	

DECOMPRESSION TABLE NO. 1

Work Pressure psig	Total Decompression Time - Minutes											
	Working Period Hours											
	1/2	1	1-1/2	2	3	4	5	6	7	8	Over 8	
48	51	89	144	189	229	269	299	309	319	319	-	
50	58	94	164	209	249	279	309	329	-	-	-	

(4)

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure psig	Working Period Hours	Decompression Data					Total Time Decompress Minutes
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	
			From	To	Minutes	Min/Pound	
14	1/2	1	14	4	2	0.20	6
		2	4	0	4	1.00	
1		1	14	4	2	0.20	6
		2	4	0	4	1.00	
1-1/2		1	14	4	2	0.20	6
		2	4	0	4	1.00	
2		1	14	4	2	0.20	6
		2	4	0	4	1.00	
3		1	14	4	2	0.20	6
		2	4	0	4	1.00	
4		1	14	4	2	0.20	6
		2	4	0	4	1.00	
5		1	14	4	2	0.20	6
		2	4	0	4	1.00	
6		1	14	4	2	0.20	6
		2	4	0	4	1.00	
7		1	14	4	2	0.20	16
		2	4	0	14	3.50	
8		1	14	4	2	0.20	16
		2	4	0	14	3.50	
Over 8		1	14	4	2	0.20	32
		2	4	0	30	7.50	
16	1/2	1	16	4	3	0.20	7
		2	4	0	4	1.00	
1		1	16	4	3	0.20	7
		2	4	0	4	1.00	
1-1/2		1	16	4	3	0.20	7
		2	4	0	4	1.00	
2		1	16	4	3	0.20	7
		2	4	0	4	1.00	
3		1	16	4	3	0.20	7
		2	4	0	4	1.00	
4		1	14	4	3	0.20	7
		2	4	0	4	1.00	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	
			From	To	Minutes	Min/Pound	
psig	Hours					Minutes	
	5	1	14	4	3	0.20	17
		2	4	0	14	3.50	
	6	1	14	4	3	0.20	33
		2	4	0	30	7.50	
	7	1	14	4	3	0.20	48
		2	4	0	45	11.25	
	8	1	14	4	3	0.20	48
		2	4	0	45	11.25	
	Over 8	1	14	4	3	0.20	63
		2	4	0	60	15.00	
18	1/2	1	18	4	3	0.20	7
		2	4	0	4	1.00	
1		1	18	4	3	0.20	7
		2	4	0	4	1.00	
1-1/2		1	18	4	3	0.20	7
		2	4	0	4	1.00	
2		1	18	4	3	0.20	8
		2	4	0	5	1.25	
3		1	18	4	3	0.20	11
		2	4	0	8	2.00	
4		1	18	4	3	0.20	17
		2	4	0	14	3.50	
5		1	18	4	3	0.20	48
		2	4	0	45	11.25	
6		1	18	4	3	0.20	63
		2	4	0	60	15.00	
7		1	18	4	3	0.20	63
		2	4	0	60	15.00	
8		1	18	4	3	0.20	73
		2	4	0	70	17.50	
Over 8		1	18	4	3	0.20	87
		2	4	0	84	21.00	
20	1/2	1	20	4	3	0.20	7
		2	4	0	4	1.00	
1		1	20	4	3	0.20	7
		2	4	0	4	1.00	
1-1/2		1	20	4	3	0.20	8
		2	4	0	5	1.25	
2		1	20	4	3	0.20	15
		2	4	0	12	3.00	
3		1	20	4	3	0.20	15
		2	4	0	12	3.00	
4		1	20	4	3	0.20	43
		2	4	0	40	10.00	
5		1	20	4	3	0.20	63
		2	4	0	60	15.00	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	
			From	To	Minutes	Min/Pound	
psig	Hours					Minutes	
	6	1	20	4	3	0.20	73
		2	4	0	70	17.50	
	7	1	20	4	3	0.20	83
		2	4	0	80	20.00	
	8	1	20	4	3	0.20	103
		2	4	0	100	25.00	
Over 8		1	20	4	3	0.20	113
		2	4	0	110	27.50	
22	1/2	1	22	6	3	0.20	9
		2	6	0	6	1.00	
1		1	22	6	3	0.20	9
		2	6	0	6	1.00	
1-1/2		1	22	6	3	0.20	16
		2	6	0	13	2.20	
2		1	22	6	3	0.20	24
		2	6	0	21	3.50	
3		1	22	6	3	0.20	38
		2	6	0	35	5.85	
4		1	22	6	3	0.20	68
		2	6	0	65	10.83	
5		1	22	6	3	0.20	93
		2	6	0	90	15.00	
6		1	22	6	3	0.20	103
		2	6	0	100	16.67	
7		1	22	6	3	0.20	113
		2	6	0	110	18.35	
8		1	22	6	3	0.20	128
		2	6	0	125	20.80	
Over 8		1	22	6	3	0.20	133
		2	6	0	130	21.70	
24	1/2	1	24	3	3	0.20	11
		2	8	4	4	1.00	
		3	4	0	4	1.00	
1		1	24	8	3	0.20	12
		2	8	4	4	1.00	
		3	4	0	5	1.25	
1-1/2		1	24	8	3	0.20	23
		2	8	4	4	1.00	
		3	4	0	16	4.00	
2		1	24	8	3	0.20	27
		2	8	4	4	1.00	
		3	4	0	20	5.00	
3		1	24	8	3	0.20	52
		2	8	4	4	1.00	
		3	4	0	45	11.25	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress	
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate		
			From	To	Minutes	Min/Pound		
psig	Hours					Minutes		
4	1	1	24	8	3	0.20	92	
		2	8	4	4	1.00		
		3	4	0	85	21.25		
	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	1.00			
	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			

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress	
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate		
			From	To	Minutes	Min/Pound		
psig	Hours					Minutes		
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			
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			

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	
			From	To	Minutes	Min/Pound	
psig	Hours					Minutes	
	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	
	5	1	32	16	3	0.20	178
		2	16	4	45	3.75	
		3	4	0	130	32.50	
	6	1	32	16	3	0.20	193
		2	16	4	60	5.00	
		3	4	0	130	32.50	
	7	1	32	16	3	0.20	203
		2	16	4	70	5.83	
		3	4	0	130	32.50	
	8	1	32	16	3	0.20	213
		2	16	4	80	6.67	
		3	4	0	130	32.50	
	Over 8	1	32	16	3	0.20	226
		2	16	4	93	7.75	
		3	4	0	130	32.50	
34	1/2	1	34	18	3	0.20	21
		2	18	4	14	1.00	
		3	4	0	4	1.00	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	
			From	To	Minutes	Min/Pound	
psig	Hours					Minutes	
	1	1	34	18	3	0.20	39
		2	18	4	14	1.00	
		3	4	0	22	5.50	
	1-1/2	1	34	18	3	0.20	58
		2	18	4	25	1.80	
		3	4	0	30	7.50	
	2	1	34	18	3	0.20	98
		2	18	4	35	2.50	
		3	4	0	60	15.00	
	3	1	34	18	3	0.20	151
		2	18	4	43	3.10	
		3	4	0	105	26.25	
	4	1	34	18	3	0.20	178
		2	18	4	55	3.93	
		3	4	0	120	30.00	
	5	1	34	18	3	0.20	195
		2	18	4	62	4.43	
		3	4	0	130	32.50	
	6	1	34	18	3	0.20	218
		2	18	4	85	6.07	
		3	4	0	130	32.50	
	7	1	34	18	3	0.20	223
		2	18	4	90	6.43	
		3	4	0	130	32.50	
	8	1	34	18	3	0.20	233
		2	18	4	100	7.15	
		3	4	0	130	32.50	
	Over 8	1	34	18	3	0.20	248
		2	18	4	115	8.23	
		3	4	0	130	32.50	
36	1/2	1	36	20	3	0.20	24
		2	20	4	16	1.00	
		3	4	0	5	1.25	
	1	1	36	20	3	0.20	44
		2	20	4	16	1.00	
		3	4	0	25	6.25	
	1-1/2	1	36	20	3	0.20	63
		2	20	4	30	1.88	
		3	4	0	30	7.50	
	2	1	36	20	3	0.20	113
		2	20	4	40	2.50	
		3	4	0	70	17.50	
	3	1	36	20	3	0.20	170
		2	20	4	52	3.25	
		3	4	0	115	28.75	
	4	1	36	20	3	0.20	198
		2	20	4	65	4.06	
		3	4	0	130	32.50	
	5	1	36	20	3	0.20	223
		2	20	4	90	5.63	
		3	4	0	130	32.50	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					
		Stage No.	Pressure Reduction Psig		Time in Stage	Total Time Decompress	
			From	To	Minutes		
psig	Hours				Min/Pound	Minutes	
6		1	37	20	3	0.20	233
		2	20	4	100	6.25	
		3	4	0	130	32.50	
7		1	36	20	3	0.20	243
		2	20	4	110	6.88	
		3	4	0	130	32.50	
8		1	36	20	3	0.20	253
		2	20	4	120	7.50	
		3	4	0	130	32.50	
Over 8		1	36	20	3	0.20	273
		2	20	4	140	8.75	
		3	4	0	130	32.50	
38	1/2	1	38	22	3	0.20	28
		2	22	6	16	1.00	
		3	6	0	9	1.50	
1		1	38	22	3	0.20	49
		2	22	6	16	1.00	
		3	6	0	30	5.00	
1-1/2		1	38	22	3	0.20	73
		2	22	6	20	1.25	
		3	6	0	50	8.34	
2		1	38	22	3	0.20	128
		2	22	6	30	1.88	
		3	6	0	95	15.83	
3		1	38	22	3	0.20	178
		2	22	6	35	2.19	
		3	6	0	140	23.35	
4		1	38	22	3	0.20	203
		2	22	6	50	3.12	
		3	6	0	150	25.00	
5		1	38	22	3	0.20	223
		2	22	6	55	3.44	
		3	6	0	165	27.50	
6		1	38	22	3	0.20	238
		2	22	6	70	4.38	
		3	6	0	165	27.50	
7		1	38	22	3	0.20	253
		2	22	6	85	5.32	
		3	6	0	165	27.50	
8		1	38	22	3	0.20	263
		2	22	6	95	5.93	
		3	6	0	165	27.50	
Over 8		1	38	22	3	0.20	278
		2	22	6	110	6.88	
		3	6	0	165	27.50	
40	1/2	1	40	24	3	0.20	31
		2	24	8	16	1.00	
		3	8	4	4	1.00	
		4	4	0	8	2.00	
1		1	40	24	3	0.20	
		2	24	8	16	1.00	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					
		Stage No.	Pressure Reduction Psig		Time in Stage	Total Time Decompress	
			From	To	Minutes		
psig	Hours				Min/Pound	Minutes	
3		8	4	5	1.25	49	
		4	4	0	25		6.25
1-1/2		1	40	24	3	0.20	84
		2	24	8	16	1.00	
		3	8	4	20	5.00	
		4	4	0	45	11.25	
2		1	40	24	3	0.20	143
		2	24	8	25	1.56	
		3	8	4	20	5.00	
		4	4	0	95	23.75	
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	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	Total Time Decompress
			From	To	Minutes	Min/Pound	
psig	Hours	No.				Minutes	
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	
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	23	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	
		2	28	12	16	1.00	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					
		Stage No.	Pressure Reduction Psig		Time in Stage	Pressure Reduction Rate	Total Time Decompress
			From	To	Minutes	Min/Pound	
psig	Hours	No.				Minutes	
		3	12	4	105	13.13	254
		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	
2		1	46	30	3	0.20	171
		2	30	14	16	1.00	
		3	14	4	47	4.70	
		4	4	0	105	26.25	
3		1	46	30	3	0.20	214
		2	30	14	16	1.00	
		3	14	4	65	6.50	
		4	4	0	130	32.50	
4		1	46	30	3	0.20	244
		2	30	14	16	1.00	
		3	14	4	95	9.50	
		4	4	0	130	32.50	
5		1	46	30	3	0.20	269
		2	30	14	16	1.00	
		3	14	4	120	12.00	
		4	4	0	130	32.50	
6		1	46	30	3	0.20	274
		2	30	14	16	1.00	
		3	14	4	125	12.50	
		4	4	0	130	32.50	
7		1	46	30	3	0.20	289
		2	30	14	16	1.00	
		3	14	4	140	14.00	
		4	4	0	130	32.50	

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress	
		Stage No.	Pressure Reduction Psig		Time in Stage Minutes	Pressure Reduction Rate Min/Pound		
			From	To				
psig	Hours					Minutes		
48	8	1	46	30	3	0.20	299	
		2	30	14	16	1.00		
		3	14	4	150	15.00		
		4	4	0	130	32.50		
	Over 8	1	46	30	3	0.20	318	
		2	30	14	25	1.56		
		3	14	4	160	16.00		
		4	4	0	130	32.50		
	50	1/2	1	48	32	3	0.20	51
			2	32	16	16	1.00	
			3	16	4	12	1.00	
			4	4	0	20	5.00	
1		1	48	32	3	0.20	89	
		2	32	16	16	1.00		
		3	16	4	35	2.92		
		4	4	0	35	8.75		
1-1/2		1	48	32	3	0.20	144	
		2	32	16	16	1.00		
		3	16	4	45	3.75		
		4	4	0	80	20.00		
2	1	48	32	3	0.20	189		
	2	32	16	16	1.00			
	3	16	4	60	5.00			
	4	4	0	110	27.50			
3	1	48	32	3	0.20	229		
	2	32	16	16	1.00			
	3	16	4	90	7.50			
	4	4	0	120	30.00			
4	1	48	32	3	0.20	269		
	2	32	16	16	1.00			
	3	16	4	120	10.00			
	4	4	0	130	32.50			
5	1	48	32	3	0.20	299		
	2	32	16	16	1.00			
	3	16	4	140	11.67			
	4	4	0	130	32.50			
6	1	48	32	3	0.20	309		
	2	32	16	16	1.00			
	3	16	4	160	13.33			
	4	4	0	130	32.50			
7	1	48	32	3	0.20	319		
	2	32	16	16	1.00			
	3	16	4	170	14.17			
	4	4	0	130	32.50			
8	1	48	32	3	0.20	319		
	2	32	16	16	1.00			
	3	16	4	170	14.17			
	4	4	0	130	32.50			
50	1/2	1	50	34	3	0.20	58	
		2	34	18	16	1.00		
		3	18	4	14	1.00		
		4	4	0	25	6.25		
	1	1	50	34	3	0.20		
		2	34	18	16	1.00		

DECOMPRESSION TABLE NO. 2

Working Chamber Pressure	Working Period	Decompression Data					Total Time Decompress
		Stage No.	Pressure Reduction Psig		Time in Stage Minutes	Pressure Reduction Rate Min/Pound	
			From	To			
psig	Hours					Minutes	
48	1-1/2	3	18	4	40	2.86	94
		4	4	0	35	8.75	
		1	50	34	3	0.20	
		2	34	18	16	1.00	
	2	3	18	4	55	3.93	164
		4	4	0	90	22.50	
		1	50	34	3	0.20	
		2	34	18	16	1.00	
	3	3	18	4	70	5.00	209
		4	4	0	120	30.00	
		1	50	34	3	0.20	
		2	34	18	16	1.00	
4	3	18	4	100	7.15	249	
	4	4	0	130	32.50		
	1	50	34	3	0.20		
	2	34	18	16	1.00		
5	3	18	4	130	8.58	279	
	4	4	0	130	32.50		
	1	50	34	3	0.20		
	2	34	18	16	1.00		
6	3	18	4	160	11.42	309	
	4	4	0	130	32.50		
	1	50	34	3	0.20		
	2	34	18	16	1.00		
7	3	18	4	180	12.85	329	
	4	4	0	130	32.50		
	1	50	34	3	0.20		
	2	34	18	16	1.00		

DO NOT INTERPOLATE, USE NEXT HIGHER VALUE FOR CONDITIONS NOT COMPUTED

[Rules (Part IV E), filed 12/28/62; § 2, filed 3/23/60.]

WAC 296-36-125 Man locks. (1) Use of man locks. Except when prevented by an emergency, compressed air workers shall pass only through the man lock when passing into or out of a compressed air area. *Exception:* Caissons having a working area less than 150 square feet may use a combination material and man lock.

(2) Size and capacity. The head room in man locks shall be not less than 6 feet and their cubical content shall provide at least 30 cubic feet of air space for each person. The capacity shall be based upon such minimum space per person and shall be posted at the entrance to the lock. The posted capacity shall not be exceeded except in case of an emergency.

(3) Equipment. Each man lock shall be equipped with the following:

(a) A recording pressure gage, fixed to the exterior of the lock on the atmospheric pressure side, shall be installed for showing the rate of decompression. The gage dial and chart shall be of such size that the amount of rise or fall in air pressure within 5 minutes will be readily discernible. The gage shall be protected by a locked box from interference or damage. This requirement will not be necessary when working at pressures of 13 pounds per square inch or less.

(b) A clock or clocks suitably placed so that the man lock attendant and persons in the man lock can readily ascertain the time.

(c) A recording pressure gage whose chart shall be of sufficient size to register a legible record of variations in pressure within the working chamber. This gage shall be readily accessible to the lock attendant.

(d) Pressure gages which will indicate to the man lock attendant the pressure in the man lock and the pressure in each working chamber to which the man lock affords direct or indirect access and to persons in the man lock the pressure in the man lock.

(e) Valves to enable the lock attendant to reduce or cut off the supply of compressed air into the man lock.

(f) Valves and pipes in connection with the air supply and exhaust which shall be so arranged that the lock and pressure can be controlled from within and without.

(g) Effective means of verbal intercommunication between the man lock attendant and (1) persons in the man lock, (2) persons in any working chamber and (3) the air compressor plant, and also some means to enable persons in the lock to convey visible or other nonverbal signals to the lock attendant.

(h) A glass bulls-eye in each end of the lock to permit observation of the occupants.

(4) **Seating facilities.** The seating facilities in man locks shall be so arranged as to provide a normal sitting posture without cramping. Seating space not less than 22 inches in width shall be provided per occupant. *Exception:* In caissons having a working area less than 150 square feet, portable seats shall be provided in the combination material and man lock.

(5) **Lighting and heating.** Every man lock shall be lighted by electricity. The lighting intensity shall be a minimum of 30 foot-candles as currently recommended for waiting rooms by the Illuminating Engineers Society. It shall also be provided with a system of radiant (infra-red) heating using electricity, steam or hot water for heating the radiant surface. The radiant surface shall be so located and protected as to prevent thermal burns. The chamber shall be heated to a minimum dry bulb temperature of 70 degrees F.

(6) **Ventilation.** A minimum ventilation rate of 20 cubic feet per minute of standard air at the prevailing ambient pressure in the lock shall be provided for each occupant. In no event shall the carbon dioxide concentration be permitted to rise above 0.5 percent by volume.

(7) **Record of decompression.** Where the pressure in the working chamber is 13 pounds or more, a record of all persons passing into or out of the working chamber shall be kept by a lock attendant who shall be stationed at the low pressure side of the man lock. Such record shall show the period of stay in the working chamber and the length of time of each decompression. Such record shall be signed by the medical officer and shall be kept on the job subject to inspection by the director of the state department of labor and industries or his authorized representative.

(8) **Automatic controls.** Each man lock shall be equipped with a suitable automatic control which through taped programs or cams or similar apparatus

shall automatically regulate compressions and decompressions. It shall also be equipped with a timing device and such manual control as will enable the lock attendant to override the automatic mechanism in an emergency. [Rules (Part V A), filed 12/28/62; §§ 3 and 4, filed 3/23/60.]

WAC 296-36-130 Special decompression chamber.

(1) **General.** The special low-pressure decompression chamber shall be provided for use when the nature of the work requires decompression times and procedures clearly within the scope of WAC 296-36-110(4).

(2) **Size and capacity.** The headroom in the special decompression chamber shall be not less than 7 feet and the cubical content shall provide at least 50 cubic feet of air space for each person. 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 person and shall be posted at the chamber entrance. The posted capacity shall not be exceeded except in case of emergency.

(3) **Equipment.** 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 gages which will indicate to the attendant and to the chamber occupants the pressure in the chamber;

(c) Valves to enable the attendant to reduce or cut off the supply of compressed air into the chamber;

(d) Valves and pipes in connection with the air supply and exhaust arranged that the chamber pressure can be controlled from within and without;

(e) Effective means of verbal intercommunication between the attendant, occupants of the chamber and the air compressor plant;

(f) A glass bulls-eye at the entrance to permit observation of the chamber occupants.

(4) **Seating facilities.** 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 in width shall be provided per occupant. Seat and back shall be padded or cushioned with a one-inch thickness of foam rubber or its equivalent.

(5) **Lighting and heating.** Lighting and heating shall comply with that for man locks, WAC 296-36-125(5).

(6) **Ventilation.** Ventilation shall comply with that for man locks, WAC 296-36-125(6).

(7) **Record of decompression.** Final stage decompression in the special chamber shall be part of the records required by WAC 296-36-125(7).

(8) **Automatic controls.** Special decompression chambers shall be equipped with automatic controls complying with WAC 296-36-125(8), for man locks.

(9) **Sanitation.** One toilet and one wash basin with hot and cold water in a screened or enclosed recess shall be provided for each 10 units of rated capacity as defined in WAC 296-36-130(2). An adequate supply of disposable

towels, drinking water and disposable cups shall be provided. No refuse or discarded material of any kind shall be permitted to accumulate and the chamber shall be kept clean.

(10) **Location.** Where practicable the special decompression chamber shall be situated adjacent to the man lock on the atmospheric pressure side of the bulkhead. When located adjacent to the man lock a passageway shall be provided connecting the special chamber with the man lock to permit workmen 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 initial pressure of the final 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.

In event that the special chamber is located remote from the man lock a means of pressurized transport shall be provided to move the men from the man lock to the special chamber without a reduction in the ambient pressure from that designated for the initial pressure of the final stage of decompression.

Under unusual circumstances or in an emergency and only with the express permission of the appointed physician, decanting procedures may be used to facilitate the movement of men at atmospheric pressure from the man lock to the special decompression chamber for the final stage of decompression. **RECOMPRESSION OF THE MEN MUST TAKE PLACE WITHIN FIVE MINUTES IN THE SPECIAL CHAMBER. THE MEDICAL LOCK SHALL NOT BE USED FOR THE RECOMPRESSION.**

(11) **Design.** The special decompression chamber and passageway or pressurized transport shall be designed for an operating pressure of 20 pounds per square inch gage pressure.

(12) **Fire protection.** All applicable provisions of WAC 296-36-190, Fire Prevention and Fire Fighting shall apply to special decompression chambers. [Rules (Part V B), filed 12/28/62.]

WAC 296-36-132 Lock attendants. (1) Whenever any workman is in a man lock or in a working chamber to which the man lock affords direct or indirect access, each working man lock shall be in the charge of a competent lock attendant who shall perform no other duties except to operate the lock and shall be employed the same number of hours as the other employees working in compressed air. The lock attendant shall control the maximum rate of compressions and shall perform all decompressions except where such compressions and decompressions are automatically regulated, but in such case the lock attendant shall have means to determine the pressures within the lock and working chamber at any time, and shall have also a timing device and such manual controls as will enable him to override the automatic mechanism in an emergency.

(2) Subject to the overall control by the lock attendant of the admission of compressed air into the lock, he

may, if so authorized by the appointed physician, allocate to a competent person who is to be compressed in the lock, the duty to regulate from inside the lock the admission of compressed air, and duty to communicate to the lock attendant any complaint of discomfort by a workman in the lock and any report by that workman that the discomfort has ceased.

(3) Man lock attendants shall be under the direct supervision, control, discipline and training of the appointed physician and each man lock attendant shall be the holder of an unexpired first-aid certificate from the Red Cross, U.S. bureau of mines, or the department of labor and industries. Lock attendants shall receive their wage payments directly from the head office of the employer and shall not be carried on or subject to the payroll procedures of the local office. A lock attendant shall not be relieved of his duties or discharged without consulting the appointed physician nor without the physician's assent. [Rules (Part VI), filed 12/28/62; § 4, filed 3/23/60.]

WAC 296-36-135 Regulation of pressure and air quality in working areas—Gage tender. There shall at all times be a thoroughly experienced competent and reliable person on duty at the air control valves as a gage tender who shall regulate the pressure in the working areas. No gage tender shall be on duty more than 8 hours in any 24. During tunneling operations, one gage tender may regulate the pressure in not more than two headings provided that the gages and controls are all in one location. In caisson work there shall be a gage tender for each caisson. [Rules (Part VII A), filed 12/28/62; Rule 303, filed 3/23/60.]

WAC 296-36-140 Regulation of pressure and air quality in working areas—Pressure monitoring. (1) **High pressure.** Every compressed air line used to maintain pressure in working areas shall have a pressure gage attached at a point in the immediate vicinity of the control valves to show the pressure on the high pressure side of the control valves. Such gages shall be so located and illuminated as to be easily read by the operator and shall be of such size and so graduated as to show clearly a change in pressure of one pound.

(2) **Back pressure.** Back pressure gages to show the pressure in the working areas shall be located on the low pressure side of the bulkhead, in the superintendent's office, at the air control valves and in the power house. Back pressure gages shall be maintained in accurate working order and shall be tested at least once every 24 hours and a record shall be kept of each such test. In addition to the foregoing back pressure gages, a continuous recording back pressure gage shall be installed to provide a record of variations and pressure in the working chamber. The record shall be kept in the superintendent's office and be available for inspection by the director of the state department of labor and industries. *Exception:* Caissons having a net working areas less than 150 square feet shall have back pressure gages installed on the low pressure side of the caisson and at the air control valves. [Rules (Part VII B), filed 12/28/62.]

WAC 296-36-145 Regulation of pressure and air quality in working areas—Air quality in working areas. (1) **Ventilation.** An automatic air quality monitoring system acceptable to the supervisor of the division of safety, department of labor and industries, shall be installed in the pressurized working chamber and shall at all times be maintained in proper working condition. The system shall provide continuous sampling and monitoring of the air and shall indicate by visual and audible alarm the presence of dangerous air contaminants in excess of the following:

Carbon monoxide	0.01%	100 ppm
Carbon dioxide	0.50%	5000 ppm
Oxides of nitrogen	0.0005%	5 ppm
Methane	0.25%	2500 ppm
Hydrogen sulphide	0.002%	20 ppm

The director in his discretion may change these concentrations to conform with good practices as recommended by the American Conference of Governmental Industrial Hygienists.

The system shall also indicate and give alarm at any time the oxygen content is less than 19.5 percent.

The system shall be so arranged that the visual and audible alarm will give warning in the working chamber and at the lock tender's station at the low pressure side of the locks.

In addition to the specific requirements contained in these standards of safety, the following rules contained in the safety standards for tunnels, shafts and subways shall apply:

WAC 296-70-070 Rock dust and WAC 296-70-080 Ventilation.

(2) **Protection against atmospheric containments:** The following rules contained in the safety standards for tunnels, shafts and subways shall apply: WAC 296-70-090 Protection against atmospheric containment. [Rules (Part VII C), filed 12/28/62; § 25, filed 3/23/60.]

WAC 296-36-150 Air supply. (1) **Clean air.** Compressed air supplied to working area shall not contain quantities of harmful or offensive air contaminants exceeding the limits set forth hereinbefore.

(2) **Amount.** Not less than 30 cubic feet per minute per man, measured at the prevailing working chamber pressure, of outside air shall be supplied to the working areas under pressure.

(3) **Supply lines.** In addition to the compressed air lines supplying working areas under pressure, there shall be a second such line of the same size and similarly equipped which shall be maintained ready for immediate use between the working chamber side of the bulkhead and the compressed air source in case of failure of the first line.

(4) **Point of discharge.** The point of discharge of the supply line in use shall be as close to the working face as is practicable and the discharge end of both supply lines shall be provided with a check valve.

(5) **Air outlet or exhaust line.** Air outlet lines from areas under pressure shall be properly located so that injurious gases may be promptly removed. Such lines shall be provided with suitable valves.

(6) **Air tools.** The high pressure air supplied for air-operated tools, equipment and appliances shall comply with the quality requirements contained in WAC 296-36-145, Air quality in working areas. [Rules (Part VIII), filed 12/28/62; Rule 2009, filed 3/23/60.]

WAC 296-36-155 Compressor plant. (1) **Capacity.** 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 or other emergency. The compressor installation shall be capable of delivering not less than 50 cubic feet per minute of ventilating air for each man in the working chamber at the prevailing working chamber pressure. Additional stand-by compressor units shall be installed in accordance with the following tabulation:

Normal installation at 50 C.F./Man/Min. units	Stand-by units	Total units	Percent rated total capacity of stand-by units divided by normal units
1	1	2	100
2	2	4	100
3	2	5	67
4	2	6	50
5	2	7	40

(2) **Sources of power.** Where the power is generated on the job there shall be a sufficient number of power units to maintain the necessary compressor operation.

(3) **Power feeders.** Where power is obtained from a public utility there shall be at least two feeders to the compressor plant. Each feeder shall have a capacity sufficient to carry the entire load and normal overload. The feeders shall run over separate routes in such a way that a breakdown of one feeder will not cause any interruption of power from the other feeder. Each feeder or service extension shall enter the compressor plant through a separate and independent opening.

(4) **Bus bar connections.** There shall be duplicate feeder bus bars at the compressor plant. Feeder connections to the bus bar shall be such that either feeder can feed to each bus bar separately or simultaneously to both bus bars. The electrical connections from the bus bars to the compressor shall be arranged in such a way as to insure continuous operation of the compressor plant, in spite of any breakdown of an individual feeder, bus bar or compressor unit.

(5) **Alternate sources of power.** Any combination of power either generated at the job or generated off the job as set forth above, and which complies with the above requirements is permitted.

(6) **Maintenance.** All equipment including reserve sources of power and reserve compressor equipment used to maintain pressure in working areas shall at all times be maintained in good repair and ready for use. All reserve equipment shall be periodically inspected and shall be operated for a period of one hour or more at least

once in every week, except where there is danger of sudden flooding, in which case reserve equipment shall be operated at least one hour in every 24 hours. An ample supply of spare parts shall be kept on hand. [Rules (Part IX), filed 12/28/62; § 12, filed 3/23/60.]

WAC 296-36-160 Personnel facilities. (1) General. There shall be provided on every job a change house which shall have a dressing room and separate spaces for each of the following: drying clothes, shower baths, toilet facilities and rest room with seating facilities and tables.

(2) **Maintenance.** The change house shall be kept clean throughout.

(3) **Dressing room.** The dressing room shall be provided with benches and a full length metal or other approved noncombustible locker with facilities for locking for each compressed air worker.

(4) **Clothes drying.** Facilities for drying clothing shall be installed and sufficient heat shall be provided to dry the clothing within 12 hours.

(5) **Toilet facilities.** One toilet and one urinal shall be provided for every 8 men or part thereof employed on each shift.

(6) **Shower baths.** Shower baths with hot and cold water shall be installed in the change house in sufficient number to provide one unit for every 8 men coming off shift.

(7) **Wash basins.** At least one wash basin with hot and cold running water or equivalent facilities at wash fountains shall be provided for every 8 men coming off shift.

(8) **Temperature.** A minimum temperature of 72 degrees F. shall be maintained in the dressing room, wash room and bathroom.

(9) **Coffee.** A sufficient supply of hot coffee, cream, milk and sugar shall be supplied to men working in compressed air at the termination of shifts and during rest periods. Coffee shall be heated by means other than direct steam. Coffee containers shall be kept clean and covered. Unless drinking cups are of the single service type, individual cups shall be sterilized after each use.

(10) **Eating space underground.**

(a) **General.** Suitable eating space shall be provided in the working chamber in the event that established working periods are of sufficient length to normally include a meal time interval. *Exception:* This requirement is not applicable to caisson work.

(b) **Facilities.**

(i) **Space requirements.** The space provided shall have a minimum head room of 6 feet 6 inches and a minimum area of 6 square feet shall be provided per person occupying the space at any one time.

The area shall be dry and clean, shall be lighted, heated and ventilated in accordance with subsections 5 and 6 of WAC 296-36-125, Man locks.

(ii) **Equipment.** The space shall be equipped with tables and comfortable seating facilities providing seating space not less than 22 inches in width per occupant; disposable towels; washing facilities with hot and cold water or in lieu thereof acceptable dry-cleansing tissues; and space outside the immediate eating area for the removal and temporary storage of protective clothing. Portable equipment, acceptable to the supervisor of

safety, department of labor and industries, which may be moved into the working chamber and removed therefrom, may be provided. [Rules (Part X), filed 12/28/62; § 21, filed 3/23/60.]

WAC 296-36-165 Sanitation below ground. (1) Toilet facilities. At least one approved chemical toilet shall be provided in the working chamber. Such facilities shall be maintained in a sanitary condition and shall be used by the workers.

(2) **Housekeeping.** No refuse or discarded material of any kind shall be permitted to accumulate underground. The man lock shall be kept clean.

(3) **Drinking water.** An ample supply of clean and potable drinking water shall at all times be available in working areas. Where water is supplied in containers it shall be kept covered. The use of common drinking cups is prohibited. [Rules (Part XI), filed 12/28/62; § 21, filed 3/23/60.]

WAC 296-36-170 Stairs and ladders. The following rules contained in the safety standards for tunnels, shafts and subways shall apply: WAC 296-70-110. [Rules (Part XII), filed 12/28/62.]

WAC 296-36-175 Lighting and power. (1) Type of installation. All lighting underground shall be by electricity. Lighting and power facilities shall comply in materials and installation practice with WAC 296-70-180 and 296-70-190, Lighting and electrical equipment as contained in Safety standards for tunnels, shafts and subways.

(2) **Emergency lighting.** The lighting circuits shall be connected to two independent sources of power supply. In addition to the lighting circuit, adequate and sufficient portable electric emergency lights shall be provided and maintained for immediate use. These shall be readily accessible to all employees working underground.

(3) **Lamp sockets.** The exterior of all lamp sockets shall be of nonmetallic material and all sockets shall be of the weatherproof type.

(4) **Location of lamps.** Lamps shall be so placed that they cannot come into contact with combustible materials and so that a clear space is provided all around.

(5) **Lamp guards.** All lamps shall be protected with wire cage guards. [Rules (Part XIII), filed 12/28/62; § 6, filed 3/23/60.]

WAC 296-36-180 Signal codes. Signal codes shall comply with WAC 296-70-150, Signals and means of communication, of Safety standards for tunnels, shafts and subways. [Rules (Part XIV), filed 12/28/62.]

WAC 296-36-185 Explosives—Blasting. (1) Storage and supply. Explosives including detonators shall not be stored or kept underground. The supply for each blast shall be taken directly from above ground to the face and immediately loaded. All explosives remaining after loading a round shall be removed to the magazine before the leading wires are connected.

(2) **Explosives in air locks.** While explosives are being locked through a tunnel bulkhead, the detonators and

explosives shall be placed at the opposite ends of the lock and no person, other than the lock tender and those persons necessary for carrying, shall be permitted in the lock. No other material or equipment shall be locked through with explosives.

Explosives and detonators shall be taken separately into caissons.

(3) **Carrying containers.** Explosives other than detonators shall be conveyed in a suitable covered wooden box painted red and provided with handles. Detonators shall be conveyed in a separate covered wooden box, painted red with a one-inch yellow stripe running horizontally entirely around the box. The box shall be provided with handles.

(4) **Blaster.** The blaster shall be a person designated by the superintendent and shall be in charge of all operations connected with preparations for blasting and shall fire all shots.

(5) **Duties of the blaster.** Before removing any explosives from the carrying containers, the blaster shall verify

(a) that the blasting switch is in "off" position and that its box is locked;

(b) that the "gap" in the blasting circuit is open; (Note: A gap of at least 5 feet on the incoming side of the switch, except during the firing operation, when connections at such gap are to be made by means of plugs, is required.)

(c) that the heading gang has been withdrawn to a safe distance or to a safe shelter, except such men from the gang as the blaster may direct to remain with him to assist in loading under his directions; and

(d) that all light and power circuits have been disconnected at a point not less than 100 feet from the place to be blasted. The blaster shall direct the loading of all holes and the making of the necessary connections in the blasting circuit; he shall sound a warning signal distinctly audible in any part of the working chamber, shield or any drift ahead of the shield where any person remaining would be exposed to injury from the blast.

(6) **Vacating blasting area.** All persons shall promptly vacate the blasting area when so directed by the blaster. When the blaster is satisfied that all persons have vacated the blasting area, he, alone, shall unlock the box that contains the blasting switch and fire the blast.

(7) **Return to blasting area.** No person shall return to the blasting area until the air in such area has been cleared of injurious concentrations of toxic fumes. The blaster shall be the first to return to the heading. He shall examine the effects of the blast and investigate the matter of possible misfires and he, alone, shall give the signal for the return of the workmen to the heading and for the restoration of light and power in the blasted area.

(8) **Hand lamps and cap lamps.** Electric hand lamps and cap lamps used by the blaster or his helpers or by any other person in the working chamber during the blasting operation shall be approved.

(9) **Blasting circuits.** All circuits used for blasting shall be ungrounded circuits. Damaged leading wires shall not be used. [Rules (Part XV), filed 12/28/62; § 14, filed 3/23/60.]

WAC 296-36-190 Fire prevention and fire fighting.

(1) **General.** Every building and every flammable structure above ground and all places underground shall be within easy range of fire fighting equipment, which shall at all times be maintained in proper working conditions and ready for use.

(2) **Smoking.** No person shall smoke or carry lighted smoking materials in compressed air. No matches, mechanical or chemical igniters will be permitted in the working chamber except those necessary for welding or flame cutting operations.

(3) **Welding or flame cutting.** While welding or flame cutting is being done in compressed air, a watchman with a fire hose or approved extinguisher shall stand by until such operation is completed. Acetylene shall not be used in compressed air at acetylene pressure exceeding 15 pounds per square inch gage, or 30 pounds per square inch absolute.

(4) **Fire hose.** 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 insure an uninterrupted flow. Fire hose when not in use shall be so located or guarded to prevent injury thereto.

Every power house, compressor house and every building housing ventilating equipment shall be provided with at least one hose connection in the water line with the fire hose connected thereto. A fire hose shall be maintained within easy reach of structures of wood over or near shafts.

(5) **Shafts and caissons.** Every shaft and every caisson containing flammable material of any kind, either above or below ground, shall be provided with a water line and a fire hose connected thereto, so arranged that all points of the shaft or caisson are within easy reach of the hose stream.

(6) **Tunnels.** Every tunnel shall be provided with a water line extending into the working chamber and to within 100 feet of the working face. Such lines shall have hose outlets with 100 feet of fire hose properly 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.

(7) **Fire extinguishers.** In addition to required fire hose protection, on every floor of every building used in connection with compressed air work, there shall be provided at least one extinguisher of adequate size approved for the class of hazard involved, except that extinguishers containing carbon tetrachloride or methyl bromide shall not be used. Extinguishers shall be so located as to be readily available and protected from damage. [Rules (Part XVI), filed 12/28/62; § 7, filed 3/23/60.]

WAC 296-36-195 **Special provisions for tunnels.** (1) **Bulkheads.** The bulkheads separating the working chamber from areas of lower pressure shall be of sufficient strength to withstand safely the maximum pressure to

which it may be subjected. Where there is a possibility of rapid flooding of the working chamber, such as might be present in subaqueous tunnels, the bulkhead shall be located sufficiently close to the face or shield to permit escape of the workers in case of an emergency. But in no case where there is such possibility shall such distance be more than 300 feet.

(2) **Safety curtain or screens.** Where danger of a blow or an in-rush of water exists in tunnels 12 feet or more in clear height, and the elevation of the top of the lining at the face and of the completed tunnel back to the emergency lock are such that a safety curtain will afford protection to the workman, a safety curtain shall be provided. It shall be located where it will afford the maximum of protection in case of an emergency but not impracticably close to the face.

Safety curtains shall be of incombustible material and shall be installed in the crown of the tunnel. They shall provide an airtight seal with the tunnel lining and shall be properly reinforced and braced as may be necessary. Curtains or screens shall be installed at right angles to the axis of the tunnel with the bottom edge horizontal. In tunnels up to and including 24 feet in inside clear height, the safety curtain shall extend down to the center line of the tunnel. In tunnels over 24 feet inside clear height, it shall extend at least 12 feet below the inside clearance line of the roof of the tunnel.

(3) **Walkways.** In tunnels 16 feet or more in diameter, containing safety curtains or screens, hanging walkways shall be provided from the face to the man lock and shall be installed as high in the tunnel as is practicable. Such walkway shall be installed above the tunnel floor and shall have at least 6 feet of head room above the walkway. A railing 42 inches high and a toe board shall be securely installed throughout the length of walkways on open sides. In areas under pressure, the walkways, stairways, and ladders including railings shall be of incombustible material.

(4) **Maintenance of walkways.** Walkways and the stairs or ladders leading thereto shall be at all times maintained clear, in good repair, and in a condition to carry safely the loads to which they may be subjected.

(5) **Ramps.** Walkways shall be provided with ramps under safety screens. Such ramps shall be provided with cleats.

(6) **Man lock and material lock.** Every tunnel shall have at least two locks in proper working condition, one of which shall be used as a material and equipment lock and the other used exclusively as a man lock.

(7) **Emergency man lock.** In subaqueous tunnels where space permits, there shall be in addition to the man lock and the material lock, an emergency man lock which shall be large enough to hold an entire heading shift and which shall be kept open toward the face and maintained ready for use at all times.

(8) **Location of locks.** Man locks and emergency locks shall be located as high in the tunnel as space will permit but the emergency lock shall be located in the crown of the tunnel.

(9) **Track safeties and brakes.** An automatic stop block or derailing device shall be provided at the top of every slope or incline greater than 3 percent. In addition,

such a device shall be installed at a point not less than 150 feet nor more than 200 feet up from any point where runaway cars may cause damage to the shield or air lock. A holding device shall be provided for cars used on inclines. Such device shall be set in the holding position during loading. [Rules (Part XVII), filed 12/28/62; §§ 10 and 18, filed 3/23/60.]

WAC 296-36-200 Special provisions for caissons.

(1) **Number of locks.** Every caisson shall have at least two locks, one of which shall be used exclusively as a man lock. *Exception:* Caissons having a working area less than 150 square feet may have a single or combined man and material lock.

(2) **Location of man locks.** The bottom of the lowest door opening of locks shall not be less than 3 feet above the water level being controlled by the use of compressed air.

(3) **Lock platforms.** All caisson locks located above ground shall be provided with an exterior platform not less than 42 inches wide with stairs or ladders leading thereto. The platform and stairs shall have a substantial handrail with midrail and the platform shall have toeboards at least 4 inches high.

(4) **Ladderways and stairways in man shafts or shafting.** Ladderways or stairways shall be provided and shall be kept clear and in good condition. Stairways shall be lighted at every landing and ladderways shall be lighted at 10-foot intervals with guarded incandescent lamps. Ladders and landings shall be of incombustible material. Pockets in the wall of the shaft shall not be used in lieu of ladders. In caissons having a working area more than 150 square feet, the man shafts shall be separated from the hoisting shaft by a barrier. Where the man shaft is separated from the hoisting shaft, the ladderways shall be provided with platform landings at intervals not exceeding 15 feet. In caissons having a working area less than 150 square feet, the ladder shall be recessed to prevent interference between the bucket and the ladder.

(5) **Hoisting.** No person shall ride on a loaded car, cage or bucket. Where the ladderway and hoistway are not separated by a barrier, no hoisting shall be done while any person is ascending or descending the ladder, nor shall any person enter the shaft while the hoisting conveyance is in motion. Standard warning signals shall be provided and shall be given and acknowledged to affect compliance with this provision.

(6) **Shoring.** Where the bottom of the excavation is below the cutting edge of the caisson and there is danger of a cave-in, the sides of the excavation shall be securely shored. [Rules (Part XVIII), filed 12/28/62; § 17, filed 3/23/60.]

WAC 296-36-210 Medical supervision and medical and first-aid facilities—Medical supervision.

(1) **Appointed physician.** Where workmen are employed in compressed air, their employer shall make arrangements for their medical supervision by one or more licensed physicians trained in the physical requirements and the medical aspects of compressed air work and the treatment of decompression illness. The employer shall arrange for medical examination of all workmen employed

in compressed air at a suitable place or places by the appointed physician in accordance with these regulations. The appointed physician or physicians shall be immediately available in case of emergency or accident. Each appointed physician shall be physically qualified to subject himself to a compressed air environment.

(2) Appointed physician's duties and responsibilities.

(a) General. All matters on the job pertaining to the health of employees, treatment on the job of illness and injuries, special first-aid and nursing personnel or assistants, lock attendants, and medical and first-aid equipment shall be under the supervision of the appointed physician.

(b) He shall make all required physical examinations.

(c) He shall make and sign all required reports of such examinations using the forms provided by the department of labor and industries.

(d) He shall make at least one inspection on the job every day of all treatment records and the required decompression record and he shall inspect or inquire into conditions which may constitute a potential hazard to the health of any employee.

(3) Certified medical attendant. There shall be on every job a certified medical attendant trained to the satisfaction of the appointed physician in administering first aid on compressed air jobs, and who shall be in attendance in the first-aid room while work in compressed air is going on and at such other times as the physician may direct. The medical attendant shall be in personal charge of the administration of first aid and such other duties as physician may direct. Under no circumstances shall female medical attendants be subjected to a compressed air environment.

(4) First-aid personnel.

(a) The superintendent and every foreman and at least one additional designated person on each shift below ground shall be trained to the satisfaction of the appointed physician in administering first aid.

(b) Where more than 10 but less than 50 men are employed per shift underground, there shall be at least 2 such additional designated trained persons on the job and available on call.

(c) Where more than 50 men are employed per shift underground, the designated trained personnel shall include all shift bosses and time keepers in addition to those required in subsection (b) above.

(d) All designated first-aid personnel shall have in their possession current first-aid certificates acceptable to the department of labor and industries.

(5) First-aid meetings. All designated first-aid personnel shall meet at least once in each 3 months or oftener if directed by the physician for further first-aid instruction by the physician.

(6) First-aid room and equipment. The employer shall provide a first-aid room properly heated and maintained within 100 yards of the principal entrance to the underground work. It shall be equipped with a first-aid kit, medical supplies and equipment consisting of not less than the minimum requirements listed in the Safety standards for tunnels, shafts and subways, WAC 296-

70-030, "Minimum first-aid requirements" supplemented by special equipment and supplies deemed necessary by the appointed physician.

(7) First-aid equipment underground. All the equipment and supplies which the appointed physician may deem necessary for first-aid underground shall be provided and maintained readily available in a suitable cabinet or cabinets. A list of the contents signed by the appointed physician shall be permanently attached to the inside of the cabinet door or cover. The cabinet shall be plainly marked with a red cross and the words "First Aid."

In caissons, one such cabinet shall be conveniently located in the working chamber.

In tunnels where a bulkhead is installed, one such cabinet shall be located on each side of the bulkhead near the entrance to the man lock.

In tunnels having no bulkhead, one such cabinet shall be located within 100 yards of the working face. [Rules (Part XIX A), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-215 Medical supervision and medical and first-aid facilities—Medical locks. **(1) Requirement and location.** When the pressure in a working chamber exceeds 13 pounds per square inch gage, a suitably constructed medical lock shall be provided and maintained and used solely for the treatment and examination of workmen working in compressed air. It shall be situated adjacent to a medical emergency room but separated therefrom to provide privacy for patient and doctor during treatment or examination.

(2) Design and equipment.

(a) The medical lock shall have not less than 6 feet of clear head room and shall consist of not less than two compartments so that the lock can be entered while under pressure. It shall be adequately ventilated, air conditioned, heated and lighted and be constructed and finished as to be readily kept in a clean and sanitary condition.

(b) The medical lock shall be designed for an operating pressure of 75 pounds per square inch gage pressure.

(c) It shall be equipped with pressure gages readily observed from inside and outside of the medical lock indicating the pressure on the inside of the lock.

(d) The air line supplying the medical lock shall be equipped with valves so arranged that the pressure may be controlled from inside or outside the lock.

(e) Oxygen inhalation apparatus shall at all times be maintained ready for use in the lock, but the source of supply shall be located outside of the lock. Oxygen and oxy-helium mixtures shall not be used until proper diagnosis is made by the appointed physician and shall be used only under his direction and supervision. The air compressing plant used for supplying compressed air to the medical lock shall have sufficient capacity to raise the pressure in the medical lock from zero pounds to 75 pounds per square inch gage within 5 minutes and shall be equipped to prevent excessively high temperature within the lock. The temperature within the lock shall not exceed 90 degrees F. at 75 pounds per square inch gage pressure.

(f) The medical lock shall be provided with suitable equipment including a couch not less than 6 feet in length, blankets, food lock, efficient means of verbal communication and of giving nonverbal signals between the inside and outside of the lock, and between the two compartments, and a window or windows through which workmen in either compartment can be observed from outside. Telephone communications shall be provided between the inside and outside of the medical lock. The telephone circuits shall, however, be so arranged that completion of calls originating inside the lock and destined for subscribers of the commercial communication system or calls the origin of which is from a subscriber of the commercial communication system and destined for the medical lock, must be completed by the lock attendant.

(g) All necessary apparatus, instruments, medical supplies and equipment as required by the appointed physician shall be kept in the lock at all times.

(3) Use of medical lock.

(a) The medical lock shall be kept ready for immediate use and, when any workman is actually employed in compressed air, shall be constantly in charge of a person trained in the use of a medical lock and suitably instructed as to the steps to be taken in the event of any workman suffering ill effects from compressed air.

(b) No workman shall enter or be treated in the medical lock in which pressure exists except at the direction of the appointed physician for the purpose of examination as to medical fitness or for the purpose of diagnosis of a suspected illness, or for treatment of the condition diagnosed by the appointed physician. [Rules (Part XIX B), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-220 Medical supervision and medical and first-aid facilities—Decompression illness—Symptoms and treatment. Every compressed air worker, upon noticing any symptom of decompression illness and wherever he may be, on the job or off the job, shall proceed immediately to the first-aid room for examination and treatment. Treatment shall be rendered promptly as directed by the appointed physician. Recompression, if prescribed by the appointed physician, shall be as the appointed physician may direct. After such treatment, the worker shall return to work only as and when directed by the physician. [Rule (Part XIX C), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-225 Medical supervision and medical and first-aid facilities—Decompression illness to be reported. Every case of decompression illness shall be reported by the physician to the ----- Distribution of the report shall be as directed by the ----- Responsibility for supervision of treatment and accuracy of the report shall rest with the physician. [Rules (Part XIX D), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-250 Routine examination of employees—Preemployment examinations and reports. (1) Every person considered for work in compressed air on

any job and before starting work shall be given a thorough medical and physical examination by the appointed physician who shall order special tests when deemed necessary. The physician's findings shall be entered on a form entitled "Preemployment History" and a form entitled "Physical Examination" furnished by the department of labor and industries. A copy of his recommendation as to employability shall be submitted to the superintendent and shall be kept on the job. The physical examination shall include adequate X-rays to determine possible preexisting lung or bone disease, a test of the ability of the ear to adjust to pressure changes, an orthopedic examination, a clear tone audiogram, an inspection for gross obesity, a simple test for pulmonary and cardiac function, and an inquiry concerning metallic objects in the body.

(2) No workman shall be employed in compressed air unless he has been examined by the appointed physician and is certified by the physician, by a health certificate or a workman's compressed air health register, to be fit for such employment, and further that the date of such certificate is not more than 3 days earlier.

(3) Where work in compressed air is urgently required to be done, before it is reasonably practical, because of the inaccessibility of the appointed physician, to arrange for any examination to obtain any certificate required, an examination may be made by any duly qualified physician who may issue a temporary certificate of fitness. A reexamination of such a workman by the appointed physician shall be made as soon as practicable. [Rules (Part XX A), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-255 Routine examination of employees—Beginners. Every person who has not previously worked in compressed air shall be tested in the medical lock as part of the preemployment examination before commencing such work. If he passes the test he shall not work more than 4 hours on his first day of work or not more than one-half the regular total work period whichever is the lesser in time, after which he shall be reexamined by the physician for physical fitness. The physician's recommendation shall be in writing and signed by him. A copy shall be submitted to the employer and shall be kept on the job. [Rules (Part XX B), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-260 Routine examination of employees—Periodic examination. Every compressed air worker shall be examined at regular intervals to determine his fitness to continue work in compressed air. The interval between regular examinations shall not exceed 2 months when work pressures are 13 pounds or less. For pressures exceeding 13 pounds, the regular periodic examination shall be made at intervals not exceeding one month. [Rules (Part XX C), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-265 Routine examination of employees—Resumption of work. (1) Every compressed air worker who has been absent from the job 10 days or

more shall be examined by the physician before resuming work. The physician's findings shall be submitted in writing to the person in charge and shall be kept on the job.

(2) Any workman who is suffering from a cold in the head, a sore throat, ear ache, or any other ailment which is likely to render him unfit for employment in compressed air shall report the matter to his employer or to the person placed in charge of the operation or to the appointed physician, and he shall not be employed in compressed air until he has since, so reporting, been examined by the appointed physician and certified by him to be fit for such employment.

(3) The appointed physician may, on examining or reexamining a person who has been or who is proposed to be employed in compressed air, vary, qualify, or revoke, by written entry in the workman's certificate, any statement relative to his fitness for employment in compressed air. By the same process, the physician may limit the pressure to which the workman is to be subjected or restrict the hours of employment or exposure in compressed air. [Rules (Part XX D), filed 12/28/62; § 23, filed 3/23/60.]

WAC 296-36-270 Routine examination of employees—Physical fitness requirements. (1) Only persons who are able to readily equalize the pressure in their ears shall be accepted for work in compressed air.

(2) Persons having chronic alcoholism shall not be permitted to work in compressed air.

(3) Persons having chronic systemic disease or any impairing physical deformity or abnormality including excessive obesity shall not be engaged for work in compressed air.

(4) Persons having any disease of the ear or any systemic disease including skeletal, cardio-vascular, respiratory, genital urinary, or gastrointestinal, which may be aggravated by work in compressed air or which may prevent safe performance of such work, shall not be permitted to work in compressed air.

(5) A person engaged for work in compressed air shall demonstrate his ability to read, speak and comprehend the English language. [Rules (Part XX E), filed 12/28/62.]

WAC 296-36-990 Severability. If any provision of this safety standard or the application thereof to any person or circumstance is held invalid, such invalidity shall not affect other provisions or applications of this safety standard which can be given effect without the invalid provisions or applications and to this end the provision of this safety standard are declared to be severable. [Rules (Part XXI), filed 12/28/62.]

Chapter 296-37 WAC

SAFETY STANDARDS—SCUBA DIVING— SUBMARINE DIVING

WAC

SCUBA DIVING

296-37-010 Scope and application.
296-37-020 Purpose.

[Title 296 WAC—p 646]

296-37-030 Definitions.
296-37-040 Appointment and duties of committees.
296-37-050 Classification of apparatus permitted and air purity.
296-37-060 Approval of equipment.
296-37-070 Diver registration—Diver training or experience physical exam and medical history record.
296-37-071 Form # 1.
296-37-072 Form # 2.
296-37-080 General requirements, procedures and techniques.
296-37-081 Form # 3.
296-37-082 Illustrations of flags and shapes.
296-37-090 Recompression chamber—Tables—Attendant.
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SUBMARINE DIVERS

296-37-300 Use of compressors in diving operations.
296-37-310 Equipment requirements—Divers air line, check valve, etc.
296-37-320 Equipment requirements—Barge operations.
296-37-330 Equipment requirements—Air tools used in underwater operations.
296-37-340 Equipment requirements—Inspection.
296-37-350 Safety rules—Generally.
296-37-360 Safety rules—Suggestions made by diver considered rule to govern.
296-37-370 Conditions on barge deck.
296-37-380 Use of two-way telephones.
296-37-390 Decompression chamber—When used.
296-37-395 Special stipulation regarding inexperienced divers and workmen.
296-37-400 Special stipulation regarding inexperienced divers and workmen—Diver may choose tender.
296-37-410 Judgment of diver to take precedent.
296-37-420 Requirement on all ship surveys.
296-37-430 Use of flood lights.
296-37-440 Rules for compressed air operations applicable to diving operations.
296-37-450 Availability of life preservers.
296-37-460 Care and replacement of equipment.

Reviser's note: The National Electric Code 1968, A U.S.A. Standard, NFPA No. 70-1968 USAC C1-1968 referred to in this chapter was filed in the office of the code reviser on February 28, 1969, to become effective April 1, 1969.

SCUBA DIVING

WAC 296-37-010 Scope and application. (1) These regulations shall apply only to those divers whose activities are covered by the Washington state industrial insurance and medical aid acts (Title 51 RCW) and involved in using self-contained underwater breathing apparatus, hereinafter referred to as SCUBA.

(2) **Duty of the department of labor and industries.** The department shall reserve the right to determine the safety aspects involved in the performance of all work governed by these regulations. [Section I, effective 2/1/64.]

WAC 296-37-020 Purpose. The purpose of these regulations is to assist those who are associated with SCUBA diving so they may better understand and recognize the hazards involved, and to provide rules which shall be recognized as minimum requirements for safety involving this type of work. [Section II, effective 2/1/64.]

WAC 296-37-030 Definitions. (1) **Air cylinders (tanks).** Vessels capable of containing high pressures involved in a diver's breathing air supply. They must have

more shall be examined by the physician before resuming work. The physician's findings shall be submitted in writing to the person in charge and shall be kept on the job.

(2) Any workman who is suffering from a cold in the head, a sore throat, ear ache, or any other ailment which is likely to render him unfit for employment in compressed air shall report the matter to his employer or to the person placed in charge of the operation or to the appointed physician, and he shall not be employed in compressed air until he has since, so reporting, been examined by the appointed physician and certified by him to be fit for such employment.

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Chapter 296-37 WAC

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SCUBA DIVING

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WAC 296-37-020 Purpose. The purpose of these regulations is to assist those who are associated with SCUBA diving so they may better understand and recognize the hazards involved, and to provide rules which shall be recognized as minimum requirements for safety involving this type of work. [Section II, effective 2/1/64.]

WAC 296-37-030 Definitions. (1) **Air cylinders (tanks).** Vessels capable of containing high pressures involved in a diver's breathing air supply. They must have

stamped on the exterior; I.C.C. classification, test dates, pressure rating.

(2) **Approved.** Means approved by the department of labor and industries.

(3) **Bottom time.** Time elapsed between the time when the diver left the surface until the time he begins ascent from deepest depth.

(4) **Daytime warnings.** Flags and shapes which when properly displayed will warn any water traffic which may enter the area during daylight hours that diving operations are in progress. (See illustrations WAC 296-37-082).

(5) **Demand system.** Supplies breathing air to the diver from the air cylinder only when the diver inhales.

(6) **Department.** Shall mean department of labor and industries.

(7) **Diving.** A person's total action taking place during all activities related to diving operations.

(8) **Diving master.** A qualified SCUBA diver who shall be in complete charge of the operation as it relates to diving.

(9) **No decompression limit.** The time/depth combination, indicating a diver can safely ascend to the surface without stopping to decompress. The appropriate U.S. Navy diving tables shall be used to make such time/depth evaluations.

(10) **Open circuit SCUBA.** A system by which the diver inhales each breath directly from the air supply and exhales to the surrounding water.

(11) **Registered diver.** (May be referred to as "diver") A person who has satisfactorily completed all specified requirements of the department.

(12) **Registration card.** A card furnished by the department indicating that the diver has satisfactorily completed all specified requirements for registration as a diver in the state of Washington.

Sample registration card

STATE OF WASHINGTON
DEPARTMENT OF LABOR AND INDUSTRIES
DIVISION OF SAFETY

This card certifies that

is a registered diver in the state.

This registration must be renewed before
----- date.

Registration Number -----

Medical examination by Dr. -----

Director

Supervisor of Safety

SAFETY

Always dive with a buddy.

Always require an adequate crew be available.

Have needed equipment available.

Plan the dive (it is recommended that plan be discussed with the local inspector).

Make certain that equipment requiring approval has been approved.

If you are not feeling well, report this to the diving master.

Have you posted all warning devices?

Keep an accurate diving record.

Don't take chances.

(13) **Repetitive dive.** Any dive performed within twelve hours of a previous dive.

(14) **SCUBA diving record.** Completion of information as described on form # 3 of these regulations. (WAC 296-37-081.)

(15) **Standby diver.** A qualified diver, adequately equipped, standing by, ready to enter the water immediately, in the event of an emergency or upon orders of the diving master.

(16) **Tender.** A person who administers to the needs of the diver.

(17) **Timekeeper.** A person responsible for completing the information required for the diving record.

(18) **Warning lights.** Lights, lamps or flares which, when illuminated will warn any water traffic which may enter the area, that diving operations are in progress. [Section III, effective 2/1/64.]

WAC 296-37-040 Appointment and duties of committees. (1) **Committee on equipment.**

(a) The supervisor of safety shall appoint a safety advisory committee for SCUBA equipment standards. This committee shall be composed of at least five individuals.

(b) The committee shall be familiar with the maintenance, operation, function and limitations of equipment.

(c) The committee shall evaluate and recommend to the safety division approval of equipment which they consider safe and suggest restrictions or limitations to equipment which they feel should be granted approval for limited use only.

(2) **Physical standards committee.**

(a) The supervisor of safety shall appoint a safety advisory committee for SCUBA divers physical requirement standards. This committee shall be composed of at least five individuals of the medical profession.

(b) The committee shall recommend the type of physical examination to be given and recommend changes to be incorporated in medical history report and medical examination forms as new technological advancements indicate such need for the preservation of the health and safety of divers.

(c) It is preferred that these appointees be familiar with diseases and physical impairments which would be incompatible with or arising from diving.

(3) **Training committee.**

(a) The supervisor of safety shall appoint a safety advisory committee for SCUBA diving training standards. This committee shall be composed of at least five individuals.

(b) These individuals shall be familiar with the type of training necessary to prepare a diver to safely perform diving duties.

(c) The instructor of each apprenticeship training class for commercial scuba diving shall be a member of this committee.

(d) The committee shall recommend the training requirements and prepare an examination for divers who are training to work on construction or commercial diving jobs governed by these regulations. [Section IV, effective 2/1/64.]

WAC 296-37-050 Classification of apparatus permitted and air purity. (1) Air and equipment.

(a) SCUBA divers shall use only open circuit apparatus.

(b) The breathing air shall be provided to the diver by a demand flow system.

(c) Divers' breathing air shall meet the requirements of purity* as follows:

(i)	Oxygen	atmospheric	atmospheric
(ii)	Maximum CO	10 ppm	10 ppm
(iii)	Maximum CO ₂	300 ppm	300 ppm
(iv)	Dust and droplets of oil and water		absent
(v)	Odors and vapors		absent

*NOTE: Recommended methods of obtaining air meeting the above purity standards will be supplied upon request by the industrial hygiene section, safety division.

[Section V, effective 2/1/64.]

WAC 296-37-060 Approval of equipment. (1) Equipment requiring approval.

(a) The following equipment must be approved by the department before it may be used in connection with any work governed by these rules:

- (i) Open circuit SCUBA, complete with demand regulator and tank with quick release harness.
- (ii) Face mask.
- (iii) Exposure suit.
- (iv) Weight belt including its quick release fastener.
- (v) Swimming fins.
- (vi) Depth gauge.
- (vii) Recompression chamber.
- (viii) Air supply for recompression chamber.
- (ix) Inflatable buoyance device intended to be worn by the diver.
- (x) Underwater watch.
- (xi) Underwater compass.

(b) This section shall not be construed to mean that other equipment is not needed for the safety and protection of the diver, or that the diver must use all equipment listed for every dive he may make.

(2) **Periodic testing of air cylinders.** Air cylinders must be hydrostatically tested periodically as recommended by I.C.C. regulations governing such vessels.

Test dates must be stamped on the cylinder or approved methods of record keeping concerning each tank and tests conducted will be accepted providing the tank is identified. [Section VI, effective 2/1/64.]

WAC 296-37-070 Diver registration—Diver training or experience physical exam and medical history record. (1) Qualified diver—Registration card prima facie evidence.

(a) A qualified diver shall be a person, medically fit and thoroughly trained or experienced in the art of industrial SCUBA diving, possessing the special mechanical skills and technical knowledge required to safely perform the underwater tasks assigned.

(b) Valid possession of a current registration card issued by the supervisor of safety, department of labor and industries, in conformity with the standards of safety pertaining to SCUBA diving (subsections (2) and (3) below) shall be prima facie evidence that the holder thereof is medically fit and thoroughly trained or experienced in the art of industrial SCUBA diving. The registration of divers shall be based upon the individual's medical condition, training and knowledge of diving and not his knowledge of special or technical skills. Said registration card shall be renewed annually to be kept current.

(2) Requirements for issuance of registration card.

(a) Prior to being issued a registration card an applicant shall:

(i) Submit a completed "Report of Medical Examination" designated as form # 1 of these regulations, concerning his physical condition, signed by a physician. (See WAC 296-37-071)

(ii) Submit a completed "Medical History Record", designated as form # 2 of these regulations, which shall be reviewed, confirmed and signed by the physician who performs the medical examination for the applicant. (See WAC 296-37-072)

(iii) Successfully complete a uniform examination prepared and recommended by the training committee as established by WAC 296-37-040(3) or present to the department, a history of successful diving experience.

(3) Availability and use of forms.

(a) "Report of Medical Examination" and "Medical History Record" forms will be available at all offices of the department of labor and industries. Information included on the completed forms shall be confidential and used only by the department to determine applicant's physical condition. [Section VII, effective 2/1/64.]

WAC 296-37-071 Form # 1.

REPORT OF MEDICAL EXAMINATION
(To be completed by physician)

NAME ----- AGE -----
ADDRESS ----- PHONE -----

A. MEDICAL HISTORY:

Is there a significant past history which would disqualify the applicant from SCUBA diving? (See accompanying history record) Yes ----- No -----

REMARKS: -----

B. EXAMINATION: Blood pressure: Systolic -----
Diastolic ----- Pulse rate: -----
Resting -----/Min. After -----
exercise -----/Min.
Post exertion blood pressure -----

(Please check items below if considered abnormal and indicate under "remarks" the pertinent details.)

- 1. General appearance -----
(incl. obesity gross defects, postural abnormalities) -----
- 2. Head and neck -----
- 3. Eyes (incl. visual acuity) -----
need for glasses -----
- 4. Nose and sinuses -----
- 5. Ears (incl. hearing, otitis, eustachian orifice, externa, perforation) -----
- 6. Spine -----
- 7. Lungs and chest -----
- 8. Heart -----
- 9. Abdomen -----
- 10. Inguinal rings -----
- 11. Genitalia -----
- 12. Anus and rectum -----
- 13. Upper extremities -----
- 14. Lower extremities -----
- 15. Neurologic -----
- 16. Psychiatric (incl. apparent motivation rediving, emotional stability, claustrophobia) -----
- 17. Skin reactions or eruptions -----
- 18. Breath holding test ----- Min. ----- Sec.
- 19. Chest X-ray -----
- 20. Chest fluoroscope -----
- 21. Valsalva maneuver -----
- 22. Eye grounds exam -----
- 23. Mouth and throat -----
- 24. Oxygen tolerance test -----

REMARKS

IMPRESSIONS

Approval: I find no defects which I consider incompatible with diving.

Conditional Approval: I do not consider diving in this person's best interests but find no defects which present marked risk. I have discussed my impression with him.

Disapproval: This applicant has defects which in my opinion clearly would constitute unacceptable hazards to his health and safety in diving.

Signature: ----- Physician.
Address: -----
Phone -----

[Form # 1, effective 2/1/64.]

WAC 296-37-072 Form # 2.

MEDICAL HISTORY RECORD
(To Be Completed By Applicant)

Name ----- Age ----- Years ----- Sex -----
Address ----- Phone -----
Height ----- inches ----- Weight ----- pounds

(if answers to the following questions require explanation, use the space labeled "Remarks" giving the number of the question).

- 1. Have you had previous experience in diving? Yes ----- No -----
Have you done any flying? Yes ----- No ----- If so, did you have trouble equalizing pressure in your ears or sinuses? Yes ----- No ----- Can you go to the bottom of a pool without having discomfort in ears or sinuses? Yes ----- No -----
- 2. Do you participate regularly in active sports? Yes ----- No ----- If so, specify what sport(s). If not, indicate what exercise you normally obtain. -----
- 3. Have you ever been rejected for service or employment for medical reasons? Yes ----- No ----- (if yes, explain under remarks or discuss with doctor).
- 4. When was your last physical examination? Date -----
Results -----
- 5. When was your last chest X-ray? Date -----
Results -----
- 6. Have you ever had an electrocardiogram? Yes ----- No -----
Results ----- Date -----
- 7. Have you ever had an electroencephalogram (brain wave study)? Yes ----- No -----
Results ----- Date -----

(Check the blank if you have, or ever have had, any of the following. Explain under "Remarks", giving dates and other pertinent information: or discuss with the doctor).

- 8. Frequent colds or sore throat -----
- 9. Hay fever or sinus trouble -----
- 10. Trouble breathing through nose (other than during colds) -----

- 11. Painful or running ear, mastoid trouble, -----
broken eardrum -----
- 12. Hardness of hearing -----
- 13. Asthma or shortness of breath after mod- -----
erate exercise -----
- 14. History of pleurisy -----
- 15. Chest pain or persistent cough -----
- 16. Fatigability -----
- 17. Spells of fast, irregular, or pounding -----
heartbeat -----
- 18. High or low blood pressure -----
- 19. Any kind of "heart trouble" -----
- 20. Frequent upset stomach, heartburn, or in- -----
digestion; peptic ulcer -----
- 21. Frequent diarrhea or blood in stools -----
- 22. Belly or backache lasting more than a day -----
or two -----
- 23. Kidney or bladder disease; blood, sugar, or -----
albumin in urine -----
- 24. Broken bone, serious sprain or strain, dis- -----
located joint -----
- 25. Rheumatism, arthritis, or other joint -----
trouble -----
- 26. Severe or frequent headaches -----
- 27. Head injury causing unconsciousness -----
- 28. Dizzy spells, fainting spells or fits. -----
- 29. Trouble sleeping, frequent nightmares, or -----
sleepwalking -----
- 30. Nervous breakdown or periods of marked -----
nervousness or depression -----
- 31. A phobia for closed-in spaces large open -----
places or high places -----
- 32. Any neurological, or psychological -----
condition -----
- 33. Train, sea, or air sickness or nausea -----
- 34. Alcoholism, or any drug or narcotic habit -----
(including regular use of sleeping pills,
benedrine, etc.) -----
- 35. Recent gain or loss of weight or appetite -----
- 36. Jaundice or hepatitis -----
- 37. Tuberculosis -----
- 38. Diabetes -----
- 39. Rheumatic fever -----
- 40. Any serious accident, injury or illness not -----
mentioned above (describe under "re-
marks" give dates) -----
- 41. Dental bridgework or plates -----
- 42. Susceptible to panic -----
- 43. Pain from altitude or flying -----

REMARKS

I certify that I have not withheld any information and that the above is accurate to the best of my knowledge.

Signature: -----
(Applicant)

I have reviewed this record.

Signature: -----
(Physician)

[Form # 2, effective 2/1/64.]

WAC 296-37-080 General requirements, procedures and techniques. (1) **Duties of the diving master.** Duties of the diving master shall include, but not be limited to: planning the dive, briefing the crew, making certain all necessary equipment is available, taking all necessary precautions against foreseeable contingencies and being responsible for the safety of the persons he supervises.

(2) **Diving when hazards exist.** Divers shall not be required to dive when the diver or diving master has reason to believe a hazard exists which would immediately jeopardize the diver's health or safety.

(3) **Buddy system required.**

(a) The buddy system of diving must be used.

(b) Buddy system of diving is a pair of divers working as a unit. They shall keep in visual or physical contact with each other so either may render immediate assistance to the other when required.

(4) **Minimum crew—Emergency conditions.**

(a) A minimum crew consisting of three qualified divers shall always be present and there shall be a diving master designated for each crew on all planned jobs. Extreme emergency conditions of very short duration will be exempt from this requirement, however, the diver in such cases should exercise good judgment and take no unnecessary chances. A variance of the minimum crew requirement may be granted for conditions where two qualified divers can safely perform the work required.

(5) **Standby diver required.** A standby diver shall remain on the surface when the working depth exceeds sixty feet, when visibility is very limited, or where water is turbulent.

(6) **Timekeeper—Diving record.**

(a) A member of each crew shall be designated as timekeeper and shall be responsible for completing the "SCUBA Diving Record" (Form # 3). (See WAC 296-37-081)

(b) A copy of the "SCUBA Diving Record" shall be kept on file by the employer for 24 months.

(7) **Tender.**

(a) A diver's tender, who shall be familiar with air decompression tables, treatment tables and other U.S.

NOTE: Rule 7.010(b) requires that a diver must re-
new his registration annually and Rule
7.020(a) requires a medical examination prior
to each renewal. After each illness the diver
should report to a physician to determine if
there is a need for a re-examination. A cur-
rent accident record shall be kept with this
medical record. (Please see next page for "re-
marks" and signature).

Navy diving tables shall be a member of each crew, when warranted.

(b) The tender shall assist the divers from the surface, in any way possible.

(8) **Written diving plan.** It is recommended that a plan of the diving operation be filed in writing and discussed with the local safety representative in charge of the inspection, prior to commencement of the diving activities.

(9) **Air decompression tables—Repetitive group designation tables.**

(a) Divers shall be guided by the latest available U.S. Navy standard air decompression tables and other appropriate U.S. Navy diving tables for decompressions and repetitive dive decompressions.

(b) Copies of the appropriate U.S. Navy table shall be available at the jobsite.

(10) **Signals.** Signals used by each crew must be thoroughly understood by each crew member. It is recommended that divers should work out a set of basic standardized signals to apply where practical.

(11) **Warnings.**

(a) Daytime warnings shall be displayed where water traffic may create a hazard for the diver.

(b) Marker buoys should be used to display the warning devices and define the limits restricted to boats, other than those connected with the diving activity.

(c) In navigable waters of the U.S., flags and lights shall be displayed in accordance with the requirements outlined in "Rules of the Road" published by the U.S. Coast Guard. A "Diver's Flag" should be displayed at the diving locations, in addition to others required, where power boats may be expected to enter the area. A "Diver's Flag" is identified as a white transverse stripe on a rectangular red field.

(12) **Protection of diving area.** Where possible, buoys should be anchored around the work area and the area roped off so as to keep unauthorized surface craft out of the immediate vicinity. [Section VIII, effective 2/1/64.]

WAC 296-37-081 Form # 3.

SCUBA DIVING

(To Be Completed By Timekeeper)

NAME: (LAST) (MIDDLE) (FIRST)

HOME ADDRESS: (STREET) (CITY) (STATE)

(FIRM NAME OF EMPLOYER)

(BUSINESS ADDRESS) (FIRM NUMBER)

GEOGRAPHICAL LOCATION OF THE DIVE:

WATER DIVE DATE TEMP. CURRENT VISIBILITY TYPE OF SUIT:
°F. WET DRY
 THICKNESS OF SUIT:

TYPE OF WORK: SWIMMING ONLY MILD
 MODERATE HEAVY

AIR CYLINDERS FILLED BY:
 (NAME AND ADDRESS OF FIRM - IF KNOWN)

REPETITIVE NO. DECOMPRESSION DIVES				
	1	2	3	4

TIME OUT

TIME IN

TIME (MIN.)

REPETITIVE GROUP IN

REPETITIVE GROUP OUT

MAXIMUM DEPTH Ft. Ft. Ft. Ft.

DIVER'S REMARKS:

DIVER'S CONDITION AT CONCLUSION OF DIVE OR DIVES:

DIVING MASTER'S REMARKS:

(DIVING MASTER'S SIGNATURE)

DECOMPRESSION TABLE

STD	SURFACE		HEO	SCHEDULE	
	AIR	OXYGEN		FT/PP	MIN
LEFT SURFACE	REACHED	LEFT BOTTOM	SURFACED	ASC. TO FIRST STOP	

IF SURFACE DECOMPRESSION USED, TIME MIN. FROM LAST WATER TO FIRST CHAMBER STOP

DECOMPRESSION STOPS - RECORD ADDITIONAL STOPS IN BLANK SPACES PROVIDED

DEPTH	WATER		CHAMBER	
	MINUTES	MINUTES	BREATHING MED.	
50				
40				
30				
20				
10				

WORK SCHEDULED AND ACCOMPLISHED:

(TIME KEEPER'S SIGNATURE)

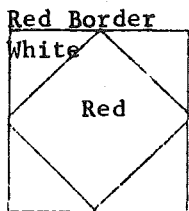
SCUBA DIVING RECORD

[Form # 3, effective 2/1/64.]

Employer must keep record of this dive on file for 24 months.

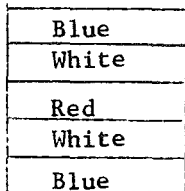
WAC 296-37-082 Illustrations of flags and shapes.

INTERNATIONAL CODE



F FOXTROT

FOXTROT

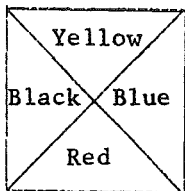


C CHARLIE

CHARLIE

ZULU

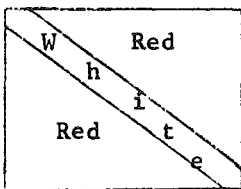
MEANS



Z ZULU

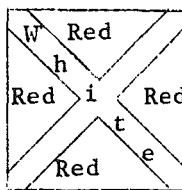
I AM DIVING

THIS FLAG IS GENERALLY
RECOGNIZED BY BOATING CLUBS, ETC.



DIVER'S FLAG

INLAND AND U. S. WATERS

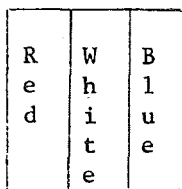


4 FOUR

FOUR

FLAG

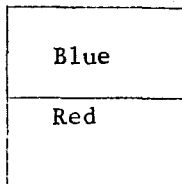
MEANS
DIVER IN WATER



T TANGO

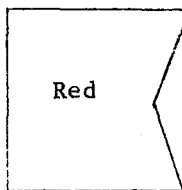
TANGO

ECHO



E ECHO

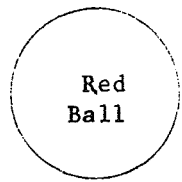
MEANS
PROCEED
SLOWLY AND WITH
CAUTION PAST
THIS VESSEL



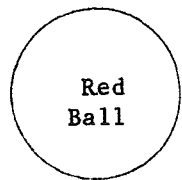
B BRAVO

BRAVO

MEANS
CAUTION



TWO RED
BALLS
TWO FEET IN
DIAMETER



MEANS
THIS VESSEL
IS AT
ANCHOR

[Illustrations, effective 2/1/64.]

WAC 296-37-090 Recompression chamber—Tables—Attendant. (1) Recompression chamber required.

(a) An approved recompression chamber shall beat the diving site whenever planned dives will exceed the "no decompression" limits as specified by the U.S. Navy standard air decompression tables.

(b) A two-lock chamber is desired, however, a one lock chamber will suffice providing it is large enough to accommodate both a patient and an attendant for him.

(c) A one-man chamber will be approved, providing it is to be a portable unit and has proper connections and facilities so that a patient can be transported to and transferred into a larger unit without interruption to his treatment.

(d) All chambers shall have a means of sending in food, water, medical supplies and other small articles.

(e) Treatment tables and decompression tables shall be posted inside and outside the chamber.

(f) All valves which can be controlled from within the chamber shall have over-riding valves installed which are operated from outside the chamber.

(g) Oxygen manifolds shall be installed in the chamber and hose and mask shall be kept inside the chamber.

(h) Sight windows shall be installed in the wall of the chamber.

(i) A means of communication shall be set up between the inside and outside of the chamber.

(j) The air supply for the chamber shall be free from harmful contaminants.

(2) Recompression chamber operator.

(a) A person, qualified to operate the recompression chamber, must be at the diving site whenever persons are diving beyond the "No Decompression" limits.

(b) The operator must have had training or be able to demonstrate that he can recognize decompression sickness and administer treatment in accordance with the U.S. Navy treatment tables.

(c) The operator may also be the standby diver, providing he meets the requirements, but under no conditions shall he be allowed to be one of the regular divers when he is assuming the operator's duties.

(d) The department will assist in scheduling a training class for operators and will issue certificates to those persons who have successfully completed such a course.

(3) Attendant for patient.

(a) An attendant shall accompany a patient within the chamber, when practical.

(b) The attendant shall be able to recognize symptoms of the patient and be able to use the proper tables and administer first aid.

(c) The attendant shall be evaluated to determine if he can withstand high pressures without ill effects.

(4) **Chamber air supply.** An approved method of supplying air shall be readily available for the immediate operation of the chamber.

(5) **Approval of transportation to a chamber.** In lieu of the aforementioned requirements, the employer may in advance, arrange for transportation from the diving site to an approved recompression chamber and air supply, which is properly manned by qualified persons, providing the required time and distance to such chamber is within

reasonable limits. Such arrangements must have the approval of the department.

(6) **Air transportation for patient.** If air transportation is arranged, provisions shall be made to furnish the patient with oxygen, and the altitude shall be as prescribed in the Federal Aviation Agency regulations. It shall be the responsibility of the pilot of the aircraft to have arranged for any deviations from these regulations (federal or state) with the proper authorities. [Section IX, effective 2/1/64.]

WAC 296-37-100 Identification. Identification tag to be worn. An identification tag bearing the following information shall be worn for a minimum of twelve hours after completion of a dive: (1) Diver's name.

(2) The following words "I am a diver".

(3) Telephone number of hospital or nearest recompression chamber or of a doctor familiar with "decompression sickness". [Section X, effective 2/1/64.]

WAC 296-37-110 Waiver or variance. (1) Application for variation. The department may, upon receipt of application in writing and after adequate investigation by the department, permit a variation from these requirements when other accepted means of protection are provided.

(2) **Limitations of variance.** Any variation granted under the provisions of this paragraph shall be limited to the particular case covered in the application for variation and may be revoked for cause.

(3) Permit for variance to be posted. The permit for variance shall be posted on the premises prior to becoming effective and shall remain posted during the life of such waiver. [Section XI, effective 2/1/64.]

SUBMARINE DIVERS

WAC 296-37-300 Use of compressors in diving operations. Compressors used in diving operations must be independent of any other operation, unless an adequate reserve tank of air is maintained under control of divers' attendants. An auxiliary or reserve supply of air shall be available at all times when divers are submerged for use in case of emergency.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 101, filed 3/23/60.]

WAC 296-37-310 Equipment requirements—Divers air line, check valves, etc. (1) The diver's air line shall be marked at the main valve next to the pressure tank with the following words, "Line to Divers, Do Not Touch."

(2) Air hose, check valves, breast plate, and receiver tank must be disconnected and each fitting and part from the pressure tank on, be blown out separately each working day.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory

upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rules 102 and 103, filed 3/23/60.]

WAC 296-37-320 Equipment requirements—Barge operations. When diver is operating from a barge, the compressor shall be located on the same barge when practicable and reasonable. In any case where air lines, signal wires, and other lines to the diver must necessarily extend from dock to barge, or from one barge to another, sufficient slack and protection for the lines and wires should be maintained to minimize risk of breakage due to rough weather or swells.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 104, filed 3/23/60.]

WAC 296-37-330 Equipment requirements—Air tools used in under-water operations. When air tools are used in under-water operations, the air line leading to these tools shall include a main valve at the pressure tank, and another valve on the air line within reach of the diver; these valves to be in addition to the conventional throttle on the air tool itself.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 105, filed 3/23/60.]

WAC 296-37-340 Equipment requirements—Inspection. Machinery and equipment used in diving operations shall be inspected daily by the tender to guard against mechanical defects and break-downs.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 106, filed 3/23/60.]

WAC 296-37-350 Safety rules—Generally. Rules which are included in the General Safety Code covering the operation of machinery shall also apply to all machinery used in diving operations.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 107, filed 3/23/60.]

WAC 296-37-360 Safety rules—Suggestions made by diver considered rule to govern. Any reasonable suggestions made by the diver for his own safety regarding the use of any of the diving apparatus shall be accepted as the rules to govern. No unsafe machinery or equipment shall be used.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 108, filed 3/23/60.]

WAC 296-37-370 Conditions on barge deck. The deck of a barge, where diving equipment is being used, shall at all times be kept clear of loose tools and other loose equipment.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 109, filed 3/23/60.]

WAC 296-37-380 Use of two-way telephones. When two-way telephones, which are in use between the diver and the attendants above water, cease functioning and communication cannot be immediately restored, the diver shall be brought to the surface, and shall not re-submerge until means of communication with the diver is assured.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 110, filed 3/23/60.]

WAC 296-37-390 Decompression chamber—When used. When dives are being made exceeding 100 feet in depth, the employer shall maintain a decompression chamber at the site of the work.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 111, filed 3/23/60.]

WAC 296-37-395 Special stipulation regarding inexperienced divers and workmen. When inexperienced men are working, either above or below an experienced workman shall be on hand at all times to guard against emergency. At no time shall an inexperienced diver be allowed to submerge with only an inexperienced tender on duty.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 112, filed 3/23/60.]

WAC 296-37-400 Special stipulation regarding inexperienced divers and workmen—Diver may choose tender. The diver shall be allowed to choose a tender in whom he has confidence.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory

upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 113, filed 3/23/60.]

WAC 296-37-410 Judgment of diver to take precedent. Under all diving conditions the reasonable judgment of the diver shall be accepted regarding length of time under water and the number of hours that can be worked with safety.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 114, filed 3/23/60.]

WAC 296-37-420 Requirement on all ship surveys. On all ship surveys, a marine engineer shall be required to stand by the throttle of the ship's main engines, which are in operating condition, to prevent starting or turning of the propellers when the diver is submerged.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 115, filed 3/23/60.]

WAC 296-37-430 Use of flood lights. All submarine flood lighting shall be thoroughly and properly insulated for under-water safety.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 116, filed 3/23/60.]

WAC 296-37-440 Rules for compressed air operations applicable to diving operations. Any rules in the Code for compressed air operations which are applicable and pertinent to diving operations shall be considered in this code.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 117, filed 3/23/60.]

WAC 296-37-450 Availability of life preservers. A life preserver shall be available at all times on barge or dock where men are working.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rule 118, filed 3/23/60.]

WAC 296-37-460 Care and replacement of equipment. (1) It shall be the duty of the employer to provide

[Title 296 WAC—p 656]

and replace when necessary, such equipment and parts thereof as may be required to keep same in efficient condition. All such used equipment shall not be handed from one employee to another until same has been sterilized as below described.

(2) Wash the equipment in a warm solution of soap or other effective cleaning agent using a brush to remove adherent particles and mucous, and then rinse in clear water until the cleaning solution is thoroughly removed. Store the equipment in a clean, well ventilated place, free from dust and other contaminating materials until used.

NOTE: Submarine diving rules in which the words "shall" or "must" are used are compulsory upon the individual concerned. Rules in which the word "should" is used are suggestive.

[Rules 119 and 120, filed 3/23/60.]

Chapter 296-43 WAC

HEATING INSTALLATIONS—CABLE, RADIANT, SOIL, ETC.

WAC

296-43-010	Heating cables—General.
296-43-020	Heating cables—Maximum wattage and temperature.
296-43-030	Heating cables—Permissible installation methods in buildings.
296-43-040	Heating cables—Thermal insulation.
296-43-050	Heating cables—Elements installed in tanks, troughs, or pipe lines containing liquids.
296-43-060	Heating element in soil or sand.
296-43-070	Heating element imbedded in driveways.

WAC 296-43-010 Heating cables—General. Heating cables or wires designed for use in low temperature heating applications, i.e., soil, water, plaster, walls and ceilings, floors, etc., shall conform to the provisions of the N.E.C. Article 422 as applicable and to the following specifications: (1) The units shall be manufactured in such continuous lengths that the maximum temperature of the element does not exceed 100 degrees C. or the maximum safe working temperature of the insulating material covering the element. Whichever is the lower temperature shall be considered the maximum permissible working temperature of the element.

(2) The insulation on the element shall equal that specified for equivalent 600 v. combined Type TW and TH or RW and RH conductor insulation and, in addition, shall meet the following requirements:

(a) Permissible maximum water absorption shall not exceed .015 grams per sq. in. of surface in distilled water at 70 degree C. in 7 days.

(b) Maximum safe operating temperature of the insulation shall not be less than 70 degrees C.

(c) It shall be suitable for the purpose intended and approved by the Washington state electrical inspection department as such.

(d) Samples for testing: The manufacturer shall submit suitable samples to the Washington state inspection department for inspection and testing as required.

(e) Marking: Each unit shall be provided with permanent labels or markings at the factory.

(i) These labels shall be placed not more than 3 in. from the terminal on each end and shall include the makers' name and the normal rating in volts and amperes; or, volts and watts.

(ii) 120 volt labels shall be bright metal or white in color. 240 v. labels shall be colored red.

(f) Units shall be installed in their complete lengths as supplied by the factory. Units from which a label or labels are missing will be considered shortened and will not be approved until such time as the installing contractor shall provide proof, by connecting suitable test meters into the circuits with which the inspector, at his convenience, may satisfy himself that the element is suitable for the purpose intended.

(g) Heating element units shall not be covered until clearance has been received from the local inspecting authority.

(h) Lead covered heating elements shall not be permitted in direct contact with plaster, concrete or similar materials capable of causing crystallization and/or checking of the lead sheath, unless protected by a suitable covering of chemically inert material.

(i) All control equipment must be of approved type and of suitable rating for the use intended. [Rules (part), filed 4/3/61.]

WAC 296-43-020 Heating cables—Maximum wattage and temperature. (1) In contact with combustible material. Maximum wattage of the element shall not exceed 3 watts per lineal foot or maximum temperature of 60 degrees c. (140 degrees F.) when in direct contact with combustible material or applied over existing ceilings.

(2) Imbedded in cement. Maximum wattage of the element shall not exceed 4 watts per lineal foot or maximum temperature of 80 degrees C. (194 degrees F.) when imbedded in cement, plaster or similar noncombustible, heat-diffusing material. [Rule (part), filed 4/3/61.]

WAC 296-43-030 Heating cables—Permissible installation methods in buildings. Wiring to the elements shall conform to the National Electrical Code and to the following conditions:

(1) Terminals.

(a) Termination of radiant heating elements shall be with solderless lugs, binding posts, or similar compression terminals.

(b) Terminal boxes for radiant heating elements, where they are terminated in junction boxes and also for the circuit wires with which they are connected, shall be protected by asbestos, glass, or similar noncombustible sleeving to a point at least 18 in. from the terminal.

(c) Not more than 3 in. of element per lead shall be permitted inside the terminal box and not more than two heating element leads shall be terminated in any 1-gang terminal box.

(d) The use of metal raceways for terminating radiant heating cables is permissible providing 6 in. clearance is maintained between points where elements enter the

raceways, and, that the elements are terminated as provided in subsections (1)(b) and (1)(c) above.

(e) Where nonheating leads, at least 2 ft. in length, from the element are provided by the factory requirements of subsections (1)(b), (1)(c) and (1)(d) above may be waived, providing that the number of wires per box shall comply with section 3705 of the N.E.C.

(2) **Imbedded in plaster.** Heating elements, when imbedded in plaster, shall conform to the following provisions;

(a) Adjacent turns shall be not less than 1 in. apart and secured suitably by insulated staples, adhesive tape, patching plaster, plaster of paris, or other suitable means of attachment, as approved by the local inspecting authority, on not less than 2 ft. centers.

(b) Nonmetallic insulating tape shall be used where the element crosses metal reinforcing on rock plaster board and similar lath substitutes, when the heating element is applied directly to the lath base. (Where possible, nonmetallic reinforcing should be substituted to avoid the hum that is occasionally generated in the reinforcing while the current is on.)

(c) When heating element is used on a surface employing metal lath base, a brown coat shall be applied sufficient to completely cover the metal lath before the element is applied; and, adhesive tape, patching plaster, plaster of paris, or other suitable means of attachment be used to secure the element in place.

(d) Heating element shall only be applied to fire resistant plaster bases.

(3) **Imbedded in concrete floors.** Heating elements imbedded in concrete floors shall conform to the following provisions:

(a) Adjacent turns shall not be less than 1 in. apart and shall be held securely in place by suitable frames or spreaders while the concrete topping is applied.

(b) Heating cables shall maintain at least 1 in. clearance between the element and adjacent metallic pipe or similar conductors imbedded in the slab.

(c) Suitable rigid conduit risers shall be provided for terminating elements imbedded in concrete floors unless raceways or other adequate means are provided for protecting the elements where they leave the slab.

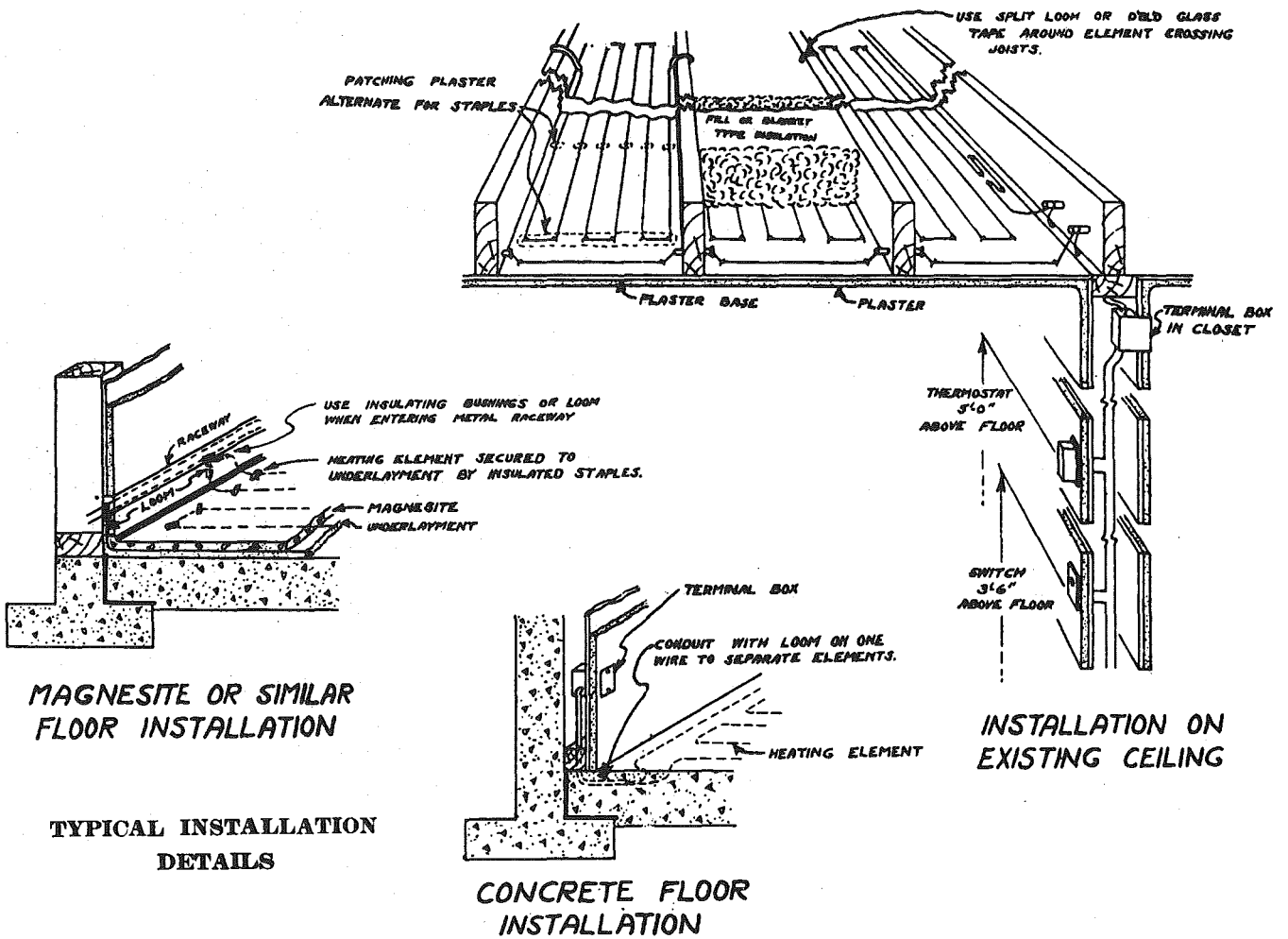
(d) Insulating sleeves shall be placed over the element from the point where it enters the slab through the conduit to the terminating box, unless nonheating leads, not less than 2 ft. long, are provided with the element by the factory.

(e) Suitable insulating bushings shall be used to separate the leads or elements where they enter the conduit in the slab.

(4) **Magnesite, terrazzo, tile and similar floors and walls.**

(a) Shall conform to the provisions of sections 1, 2, and 3 as applicable.

(b) Heating cables may be attached to the surface of the underlayment where magnesite or terrazzo floors are installed.

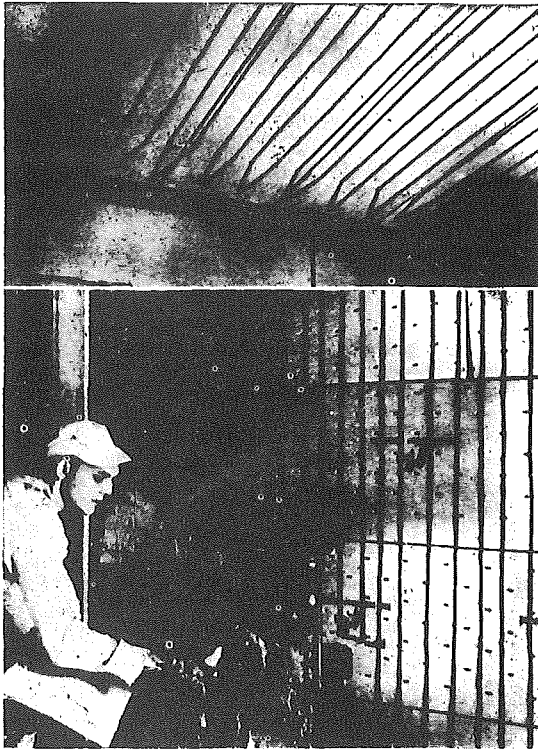


MAGNESITE OR SIMILAR FLOOR INSTALLATION

TYPICAL INSTALLATION DETAILS

CONCRETE FLOOR INSTALLATION

INSTALLATION ON EXISTING CEILING



Upper: Heating cable applied to plaster board ceiling ready for plaster. Note clearance between metal lath and heating cable.

Lower: Heating cable applied to plaster board wall. Note that elements run vertically to allow plasterer to apply the brown coat parallel to the cable.

(5) Linoleum, asphalt tile and similar floor coverings may be placed over heating elements on wood floors providing the element is first covered with 3/8 in. of magnesium oxychloride or equal fire resistant underlayment.

(6) Existing ceilings.

(a) Heating elements placed over existing ceilings shall be suitably secured thereto conforming to the provisions of WAC 296-43-020(1), and 296-43-030(1), (2), and (3) as applicable.

(b) Wood lath shall be covered with asbestos paper, gypsum board or similar fire resistant material before the element is applied to the ceiling.

(c) Heating elements shall not be applied over insulating board type of lath such as celotex, insulite, firtex, and similar materials. Where this type of material is used, the element should be secured to the under face of the ceiling and covered with plaster or fire resistant board of a noninsulating type.

(d) Elements crossing ceiling joints shall be enclosed in split loom or folded glass tape to protect the element.

(7) Gypsum board, plaster lath and similar heat conducting fire resistant materials may have the heating element applied directly thereto.

(8) Ceilings of combustible material; i.e., wood veneer, tempered hardboard and similar heat conducting materials shall first be covered by asbestos paper, gypsum board, or similar fire resistant material.

(9) Pads containing heating elements for placing heating elements in spaces over existing ceilings or in walls or floors which are otherwise inaccessible, shall conform to the provisions of WAC 296-43-010(1), (2), 296-43-020(1), 296-43-030(6), (7), (8), and 296-43-040 as applicable, and the following specifications:

(a) The pads shall be of fire resistant, nonconducting material.

(b) The pads shall rigidly secure the element in such a manner that it will be impossible for the adjacent turns of the element to touch.

(i) The leads shall be suitably secured to the pad in a manner which provides permanent adequate separation between the leads.

(ii) The leads shall be covered with an insulating sleeve from the pad to the termination of the heating part of the element.

(iii) All connections must be accessible. [Rules (part), filed 4/3/61.]

WAC 296-43-040 Heating cables—Thermal insulation. Thermal insulation placed over heating elements or in contact therewith shall be noncorrosive, noncombustible, nonconducting material as provided in section 3249 of the N.E.C. [Rules (part), filed 4/3/61.]

WAC 296-43-050 Heating cables—Elements installed in tanks, troughs, or pipe lines containing liquids. Elements installed in tanks, troughs or pipe lines containing liquids shall be provided with suitable insulating terminating bushings and terminal boxes at the points where the element enters and leaves the tank, trough, or pipe line. Elements so installed shall be secured in a manner maintaining at least 1 in. clearance between turns. [Rules (part), filed 4/3/61.]

WAC 296-43-060 Heating element in soil or sand. (1) Heating element in soil or sand shall be so spaced that the minimum distance between adjacent turns is not less than 1 in.

(2) Heating elements shall never be placed directly in peat moss or similar material of an insulating nature. Where peat moss or similar material is used, the element shall be protected by a layer of at least 1 in. over and 1 in. under the element, of a heat conducting material such as sand.

(3) Suitable drains for condensation shall be provided at the bottom of all boxes used in greenhouse or hotbed wiring.

(4) Where open wiring is used in greenhouses and hotbeds, the use of nonmetallic boxes and covers is recommended as provided in section 3716 of the N.E.C. [Rules (part), filed 4/3/61.]

WAC 296-43-070 Heating element imbedded in driveways. Heating elements imbedded in driveways shall conform to the provisions of WAC 296-43-010, 296-43-020 and 296-43-030(3), as applicable. [Rules (part), filed 4/3/61.]

Chapter 296-44 WAC
SAFETY STANDARDS—ELECTRICAL
CONSTRUCTION CODE

WAC

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WAC 296-44-005 Preface. (1) The purpose of these rules and regulations is to formulate, for the state of Washington, uniform requirements for electrical construction and installations, the application of which shall insure adequate service and secure safety to persons engaged in the construction, installation, maintenance, operation, or use of electrical lines and equipment and to the public in general.

(2) These rules and regulations, however, are not to be considered as conflicting or superseding existing statutes relating to electrical construction and installations as contained in chapter 19.29 RCW.

(3) The first rules for electrical construction, of the state of Washington, were adopted as chapter 130, Laws of 1913 (chapter 19.29 RCW). During the period that these rules have had their application very few changes were made; however the industry witnessed tremendous development and manufacture of new materials and apparatus, use of new methods of installation, and advancement of the industry generally.

(4) In order to keep the rules for electrical and communications utilities abreast of the times it was apparent to all interested parties that a review of the present rules was mandatory in order to reflect in rules the progress which has been made and at the same time to make such revisions that practice has shown desirable and necessary for service and for the protection and safety of the workmen and the public in general. In order to accomplish this revision, and realizing that such a revision is concerned with many technical matters including consideration of controversial matters, a committee composed of representatives of the electrical and communication utilities and labor was appointed to review and discuss the proposed changes, keeping in mind that codes of practice of this type, of necessity include compromises between conflicting aims and that the rules must be compatible to both industry and labor.

(5) These rules provide a standard of safety both to the workmen and to the public. They contribute materially to the standard of service rendered by the utilities, and also afford a means of coordination between different types of lines, such as power and communications.

(6) Rules in this code which are to be regarded as mandatory are characterized by the use of the word "shall." Where a rule is of an advisory nature it is indicated by the use of the word "should." Other practices which are considered desirable and not intended to be mandatory are stated as recommendations. It is realized that conditions may exist which necessitate departures from such recommendations. [Preface (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-010 Definitions of special terms. (1) "Administrative authority" means the department of labor and industries through the supervisor of the division of safety.

(2) "Alive or live" means electrically connected to a source of potential difference, or electrically charged so as to have a potential different from that of the earth. The term "live" is sometimes used in place of the term "current-carrying," where the intent is clear, to avoid repetitions of the longer term.

(3) "Appliance" means current-consuming equipment, fixed or portable; for example, heating, cooking, and small motor-operated equipment.

(4) "Arm or crossarm" means a horizontal support attached to poles or structures generally at right angles to the conductor supported.

(5) "Arm, buck" means a crossarm used to change the direction of all or part of the conductors on the line

arm immediately above or below. A buck arm is generally placed at right angles to the line arm.

(6) "Arm, clearance" means a crossarm supporting conductors installed on a pole of another line for the purpose of maintaining the prescribed clearances of these rules which, if the other line did not exist, could be maintained without such clearance arm.

(7) "Automatic" means self-acting, operating by its own mechanism when actuated by some impersonal influence—as, for example, a change in current strength; not manual, without personal intervention. Remote control that requires personal intervention is not automatic, but manual.

(8) "Bridge" means a structure which is used primarily for foot, vehicular or train traffic as distinguished from those which span certain areas and support signals or wires and which are classed as supporting poles, towers or structures.

(9) "Cable" means a stranded conductor (single conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).

(10) "Cable vault." (See definition of "manhole.")

(11) "Catenary construction" is that type of construction where an auxiliary wire or messenger is used to assist in supporting in desired alignment trolley contact wire, cables or large conductors that are incapable of supporting themselves in this desired alignment.

(12) "Circuit" means a conductor or system of conductors through which an electric current is intended to flow.

(13) "Circuit breaker" means a device designed to open under abnormal conditions a current-carrying circuit without injury to itself. The term as used in this code applies only to the automatic type designed to trip on a predetermined overload of current.

(14) "Circuits, railway signal" means those supply and communication circuits used primarily for supplying energy for controlling the operation of railway block signals, highway crossing signals, interlocking apparatus and their appurtenances.

(15) "Circuits, supply" means those circuits which are used for transmitting a supply of electrical energy.

(16) "Climbing space" means the space reserved along the surface of a pole or structure to permit ready access for linemen to equipment and conductors located on the pole or structure.

(17) "Common neutral system" is a system in which one conductor is used as the neutral for 2 or more different circuits; one conductor is used as the neutral for both primary and secondary circuits of a distribution system.

(18) "Common use" means simultaneous use by two or more utilities of the same kind.

(19) "Conductor" means a metallic conducting material, usually in the form of a wire or cable, suitable for carrying an electric current. Does not include bus bars.

(20) "Conductor, grounding" means a conductor which is used to connect the equipment or the wiring system with a grounding electrode or electrodes.

(21) "Conductor, lateral" means a conductor extending in a general horizontal direction and usually at an

angle of approximately 90 degrees to the direction of the line conductors.

(22) "Conductor, line" means one of the wires or cables carrying electric current, supported by poles, towers, or other structures, but not including vertical or lateral connecting wires.

(23) "Conductors, open" means conductors separately and individually supported.

(24) "Conductors, unprotected" means supply conductors not covered by a "suitable protective covering," grounded metal conduit, grounded metal sheath or shield, or impregnated fiber.

(25) "Conductor, vertical" means, in pole wiring work, a wire or cable extending in an approximately vertical direction.

(26) "Conflict, antenna" means that an antenna or its guy wire is at a higher level than a supply or communication conductor and approximately parallel thereto, provided the breaking of the antenna or its support will be likely to result in contact between the antenna or guy wire and the supply or communication conductor.

(27) "Conflict, conductor" means that a conductor is so situated with respect to a conductor of another line at a lower level that the horizontal distance between them is less than the sum of the following values:

(a) Five feet.

(b) One-half the difference of level between the conductors concerned.

(c) The value required in Tables 6, 7, or 8 (WAC 296-44-325) for horizontal separation between conductors on the same support for the highest voltage carried by either conductor concerned. [See illustration at end of this section.]

(28) "Conflict, structure" (As applied to a pole line) means that the line is so situated with respect to a second line that the overturning (at the ground line) of the first line will result in contact between its poles or conductors and the conductors of the second line, assuming that no conductors are broken in either line. [See illustration at end of this section.]

Exceptions: Lines are not considered as conflicting under the following conditions:

(a) Where one line crosses another.

(b) Where two lines are on opposite sides of a highway, street, or alley and are separated by a distance not less than 60 percent of the height of the taller pole line and not less than 20 feet.

(29) "Current-carrying part" means a conducting part intended to be connected in an electric circuit to a source of voltage. Noncurrent-carrying parts are those not intended to be so connected.

(30) "Dead" means free from any electric connection to a source of potential difference and from electric charge; not having a potential different from that of the earth. The term is used only with reference to current-carrying parts which are sometimes alive.

(31) "Dead end" means the act, point or equipment used to transfer the mechanical tension in conductors from the conductors to noncurrent-carrying parts of a

structure used to support the conductors and still maintain the insulating requirements of the conductors dead-ended.

(32) "Device" means a unit of an electric wiring system which is intended to carry but not consume electric energy.

(33) "Disconnecter" means a switch which is intended to open a circuit only after the load has been thrown off by some other means.

(34) "Districts, loading" means those areas in which the specified loadings of these rules apply and are known as "heavy," "medium," and "light" loading districts.

(35) "Districts, rural" means all places not urban, usually in the country, but in some cases within city limits.

(36) "District, urban" means thickly settled areas (whether in cities or suburbs) or where congested traffic often occurs. A highway, even though in the country, on which the traffic is often very heavy, is considered as urban.

(37) "Division of safety" means the division of safety of the department of labor and industries.

(38) "Duct" means (in underground work) a single tubular runway for underground cables.

(39) "Electrical supply station" means any building, room, or separate space within which electric-supply equipment is located and the interior of which is accessible, as a rule, only to properly qualified persons.

Note: This includes generating stations and substations and generator, storage-battery, and transformer rooms, but excludes manholes and isolated-transformer vaults on private premises. (See definition of "transformer vault.")

(40) "Electrode, grounding" means a suitable metallic conducting material (generally copper or copper clad) imbedded in the earth and used for maintaining ground potential on conductors connected to it and for dissipating into the earth such electric current as may be impressed upon it.

(41) "Equipment" means a general term including fittings, devices, appliances, fixtures, apparatus, and the like, used as a part of, or in connection with, an electric installation.

(42) "Equipment, electric supply" means equipment which produces, modifies, regulates controls, or safeguards a supply of electric energy. Similar equipment, however, is not included where used in connection with signaling systems under the following conditions;

(a) Where the voltage does not exceed 150 volts.

(b) Where the voltage is between 150 and 550 volts, and the power transmitted does not exceed 3.2 kilowatts.

(43) "Equipment, utilization" means equipment, devices, and connected wiring which utilize electric energy for mechanical, chemical, heating, lighting, testing, or similar purposes and are not a part of supply equipment, supply lines, or communication lines.

(44) "Explosion-proof" means capable of withstanding without injury and without transmitting flame to the outside any explosion of gas which may occur within.

(45) "Exposed:"

(a) "Applied to circuits" or lines means in such a position that in case of failure of supports or insulation contact with another circuit or line may result.

(b) "Applied to equipment["] means that an object or device can be inadvertently touched or approached nearer than a safe distance by any person. It is applied to objects not suitably guarded or isolated.

(46) "Externally operable" means capable of being operated without exposing the operator to contact with live parts.

Note: This term is applied to equipment, such as a switch, that is inclosed in a case or cabinet.

(47) "Ground connection" means the equipment used in establishing a conducting path between an electric circuit or equipment and earth. A ground connection consists of a ground conductor, a ground electrode and the earth (soil, rock, etc.) which surrounds the electrode.

(48) "Grounded" means connected to earth by a ground connection or by an unintentional conducting path.

(49) "Grounded, effectively" means permanently connected to earth through a ground connection of sufficiently low impedance and having sufficient current-carrying capacity to prevent the building up of voltages which may result in undue hazard to connected equipment or to persons.

(50) "Grounded, system" means a system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded, either solidly or through a current-limiting device.

(51) "Guarded" means covered, shielded, fenced, inclosed, or otherwise protected, by means of suitable covers or casings, barrier rails or screens, mats or platforms, to remove the liability of dangerous contact or approach by persons or objects to a point of danger.

(52) "Guy" means a tension member (a solid wire or stranded wires) used to withstand an otherwise unbalanced force on a pole, crossarm, or other overhead line structure.

(53) "Guy, anchor" means a guy which has its lower anchorage in the earth and includes a sidewalk or ground guy.

(54) "Guy, overhead (span)" means a guy extending from a pole, crossarm, or structure to a pole, crossarm, or structure.

(55) "Handhole" means an opening in an underground system into which workmen reach, but do not enter.

(56) "Identification" means, for the purpose of these rules, to identify or identification, shall mean that method of coloring, lettering, numbering, marking or maintaining in any certain position in relation to other objects, the same wire, cable pipe, circuit, phases, or other material objects throughout the installation.

(57) "Inclosed" means surrounded by a case which will prevent accidental contact of a person with live parts. A solid inclosure means one which will neither admit accumulations of flyings or dust, nor transmit sparks or flying particles to the accumulations outside.

(58) "Insulated" means separated from other conducting surfaces by a dielectric substance or air space permanently offering a high resistance to the passage of current and to disruptive discharge through the substance or space.

Note: When any object is said to be insulated, it is understood to be insulated in suitable manner for the conditions to which it is subjected. Otherwise, it is, within the purpose of these rules, uninsulated. Insulating coverings of conductors is one means for making the conductors insulated.

(59) "Insulating" (where applied to the covering of a conductor, or to clothing, guards, rods, and other safety devices) means that a device, when interposed between a person and current-carrying parts, protects the person making use of it against electric shock from the current-carrying parts with which the device is intended to be used; the opposite of conducting.

(60) "Isolated" means that an object is not readily accessible to persons unless special means for access are used.

(61) "Isolation by elevation" means elevated sufficiently so that persons may safely walk underneath.

(62) "Joint use" means simultaneous use by two or more kinds of utilities.

(63) "Lightning arrester" means a device which has the property of reducing the voltage of a surge applied to its terminals, is capable of interrupting follow current if present, and restores itself to its original operating conditions.

(64) "Lines."

(a) Communication lines means the conductors and their supporting or containing structures which are located outside of buildings and are used for public or private signal or communication service, and which operate at not exceeding 400 volts to ground or 750 volts between any two points of the circuit, and the transmitted power of which does not exceed 150 watts. When operating at less than 150 volts no limit is placed on the capacity of the system.

Note: Telephone, telegraph, railroad-signal, messenger-call, clock, fire or police-alarm and other systems conforming with the above are included.

Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so run.

Exception is made under certain conditions for communication circuits used in the operation of supply lines. (See WAC 296-44-424(1)).

(b) "Communication lines, minor" means communication lines carrying not more than two circuits used mainly for local telephone or telegraph service, or for police or fire-alarm service.

(c) "Electric supply" means those conductors and their necessary supporting or containing structures which are located entirely outside of buildings and are used for transmitting a supply of electric energy.

Does not include open wiring on buildings, in yards or similar locations where spans are less than 20 feet, and

all the precautions required for stations or utilization equipment, as the case may be, are observed.

Railway signal lines of more than 400 volts to ground are always supply lines within the meaning of these rules, and those of less than 400 volts may be considered as supply lines, if so run and operated throughout.

(65) "Low voltage protection" means the effect of a device operative on the reduction or failure of voltage to cause and maintain the interruption of power supply to the equipment protected.

(66) "Low voltage release" means the effect of a device operative on the reduction or failure of voltage to cause the interruption of power supply to the equipment, but not preventing the reestablishment of the power supply on return of voltage.

(67) "Maintenance" means the work done on any line or any element of any line for the purpose of extending its life (excepting the replacement of the supporting poles or structures) and includes the replacement, for any reason, of crossarms, pins, insulators, wires, cables, messengers, etc., but does not contemplate the addition of elements (excepting pole stubs and guy wires) which will change the identity of the structure.

(68) "Manhole" (more accurately termed splicing chamber or cable vault) means an opening in an underground system which workmen or others may enter for the purpose of installing cables, transformers, junction boxes, and other devices, and for making connections and tests.

(69) "Manual" means capable of being operated by personal intervention.

(70) "Messenger" means stranded wire which generally is not a part of the conducting system, its primary function being to support wires or cables of the conducting system; sometimes called "suspension strand."

(71) "Minor tracks" means railway tracks included in the following list:

(a) Spurs less than 2,000 feet long and not exceeding two tracks in the same span.

(b) Branches on which no regular service is maintained or which are not operated during the winter season.

(c) Narrow-gage tracks or other tracks on which standard rolling stock cannot, for physical reasons, be operated.

(d) Tracks used only temporarily for a period not exceeding 1 year.

(e) Tracks not operated as a public utility, such as industrial railways used in logging, mining, etc.

(72) "Multi-grounded system" means a system in which the neutral conductor is grounded at many places.

(73) "Objectionable flow of current," in grounding conductors, means any measurable amount of current flowing to earth which can be attributed to inadequately or improperly installed metallic return to sources of supply.

(74) "Open wire" means a conductor or pair of conductors separately supported above the surface of the ground.

(75) "Panelboard" means a single panel, or a group of panel units designed for assembly in the form of a single panel, including buses and with or without switches

and/or automatic overcurrent-protective devices for the control of light, heat, or power circuits of small individual as well as aggregate capacity; designed to be placed in a cabinet or cut-out box placed in or against a wall or partition, and accessible only from the front. (See definition of "Switchboard.")

(76) "Pole face" means that side of the pole on which crossarms are attached, or which is so designated by the utilities owning or operating the pole.

(77) "Qualified" means familiar with the construction and operation of the apparatus and the hazards involved.

(78) "Raceway" means any channel for loosely holding wires or cables in interior work, which is designed expressly and used solely for this purpose. Raceways may be of metal, wood, or insulating material, and the term includes wood and metal moldings consisting of a backing and capping, and also metal ducts into which wires are to be pulled.

(79) "Racks, vertical (secondary racks)" for the purpose of these rules shall include individual supports in rack configuration used for the support of conductors of 0 to 750 volts.

(80) "Reconstruction" means replacement of any portion of an existing installation by new equipment or construction. Does not include ordinary maintenance replacements.

(81) "Risers" means conductors which extend below the ground line and are generally installed on the surfaces of poles.

(82) "Sag:"

(a) "Apparent sag at any point" means the departure of the wire at the particular point in the span from the straight line between the two points of support of the span, at 60° F, with no wind loading.

(b) "Apparent sag of a span" means the maximum departure of the wire in a given span from the straight line between the two points of support of the span, at 60° F, with no wind loading.

(c) "Final unloaded sag" means the sag of a conductor after it has been subjected for an appreciable period to the loading prescribed for the loading district in which it is situated, or equivalent loading, and the loading removed.

(d) "Initial unloaded sag" means the sag of a conductor prior to the application of any external load.

(e) "Maximum total sag" means the total sag at the midpoint of the straight line joining the two points of support of the conductor.

(f) "Total sag" means the distance measured vertically from any point of a conductor to the straight line joining its two points of support, under conditions of ice loading equivalent to the total resultant loading for the district in which it is located.

(g) "Unloaded sag of a conductor at any point in a span" means the distance measured vertically from the particular point in the conductor to a straight line between two points of support, without any external load.

(83) "Service" means the conductors and equipment for delivering electric energy from the secondary distribution or street main, or other distribution feeder, or from the transformer to the wiring system of the premises served.

(84) "Service drops" means the conductors strung between a pole line and a building or structure.

(85) "Span length" means the horizontal distance between two adjacent supporting points of a conductor.

(86) "Span wire" means a wire or cable used as an auxiliary support for wires, cables, or other equipment. As applied to trolley construction, it means a wire or cable used to support laterally, or which is attached to wires which support laterally, trolley contact conductors and appurtenances in electrical contact therewith, including wires commonly referred to as cross-span wires, bracket-span wires, pull-offs, trolley strain guys, dead ends, etc.

(87) "Splicing chamber." (See definition of "Manhole.")

(88) "Substantial" means so constructed and arranged as to be of adequate strength and durability for the service to be performed under the prevailing conditions.

(89) "Supervisor" means the supervisor of the division of safety.

(90) "Switch" means a device for opening and closing or for changing the connection of a circuit. In these rules, a switch will always be understood to be manually operated, unless otherwise stated.

(91) "Switchboard" means a large single panel, frame, or assembly of panels, on which are mounted (on the face, or back, or both) switches, fuses, busses, and usually instruments.

(92) "Tags" means "men at work" tags of distinctive appearance, indicating that the equipment or lines so marked are being worked on.

(93) "Tension:"

(a) "Final unloaded conductor tension" means the longitudinal tension in a conductor after the conductor has been stretched by the application for an appreciable period, and subsequent release, of the loadings of ice and wind, and temperature decrease, assumed for the loading district in which the conductor is strung (or equivalent loading).

(b) "Initial conductor tension" means the longitudinal tension in a conductor prior to the application of any external load.

(94) "Transformer vault" means an isolated inclosure either above or below ground with fire-resistant walls, ceiling, and floor, in which transformers and related equipment are installed, and which is not continuously attended during operation.

(95) "Voltage of a circuit" means the highest effective voltage between any two conductors of the circuit concerned.

Exception: Voltage of a grounded multiwire circuit, not exceeding 750 volts between any two conductors, means the highest effective voltage between any wire of the circuit and that point or conductor of the circuit which is grounded.

If one circuit is directly connected to another circuit of higher voltage (as in the case of an autotransformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as

distinguished from connection merely through electro-magnetic or electrostatic induction.

(96) "Voltage to ground of:"

(a) A "grounded circuit" means the highest effective voltage between any conductor of the circuit and that point or conductor of the circuit which is grounded.

(b) An "ungrounded circuit" means the highest effective voltage between any two conductors of the circuit concerned.

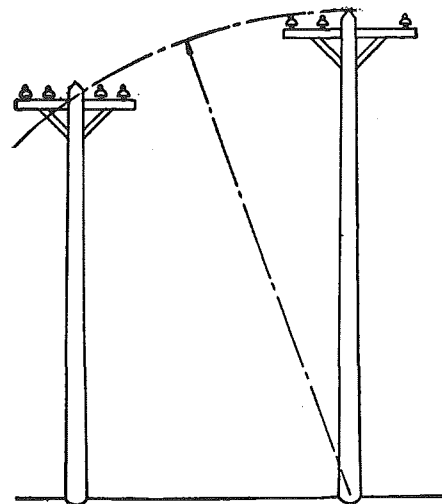
A "conductor of:"

(a) A "grounded circuit" means the highest effective voltage between such conductor and that point or conductor of the circuit which is grounded.

(b) An "ungrounded circuit" means the highest effective voltage between such conductor and any other conductor of the circuit concerned.

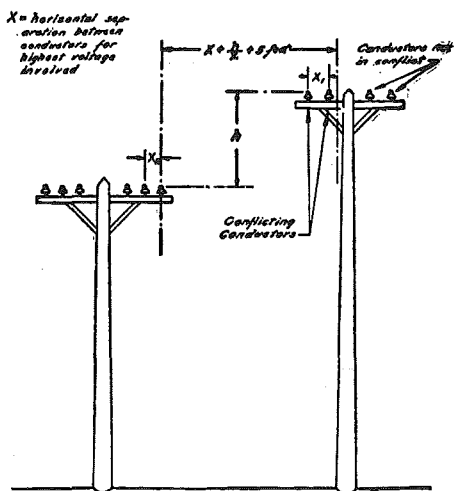
(97) "Wire gages:" The American Wire Gage (AWG), otherwise known as Brown & Sharpe (B&S), is the standard gage for copper, aluminum, and other conductors, excepting steel, for which the Steel Wire Gage (Stl. WG) is used throughout these rules.

(98) "Working space, lateral" means the space reserved for working between conductor levels outside the climbing space, and to its right and left.



Structure Conflict

[§ 1, filed 3/23/60, effective 12/1/58.]



Conductor Conflict

WAC 296-44-013 Purpose and scope of rules. (1) **Purpose.** Purpose of these rules is to formulate, for the state of Washington, uniform requirements for electrical installations, the application of which shall insure adequate service and secure safety to persons engaged in the construction, maintenance, operation, or use of electrical lines and equipment and to the public in general.

(2) **Scope.** These rules are not intended as complete construction specifications but embody only the requirements which are considered most important from the standpoint of safety and service. Construction shall be according to accepted good practice for local conditions in all particulars not specified in these rules. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-016 Applicability of rules—General. These rules will apply to:

- (1) All overhead electrical supply and communications lines and equipment located outside of buildings.
- (2) Underground lines and equipment.
- (3) Stations and substations.
- (4) Radio installations.
- (5) All other electrical installations which come under the jurisdiction of the electrical utility inspectors of the division of safety, department of labor and industries.
- (6) The installation and maintenance of electric utilization equipment. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-019 Applicability of rules—To construction and reconstruction of lines. These rules apply to all such lines and extensions constructed after the adoption of these rules and shall become applicable also to such lines now existing or any portion thereof whenever they are reconstructed.

(1) **Reconstruction.** The reconstruction of an element of a line requires that all elements subordinate to the reconstructed element meet the requirements of these rules. For the purpose of these rules, reconstruction will be construed to mean: "Replacement of any portion of an existing installation by new equipment or construction," except:

(a) **Service drops.** Service drops may be added to existing plant without necessitating changes in the circuit or line from which they originate.

(b) **Conductors.** Conductors or circuits added to crossarms installed prior to the effective date of these rules will not be required to afford greater ground clearances than the ground clearance provided by conductors of the same or higher voltage classification which are already in place on such arms.

All other clearances except ground clearances with which such added conductors or circuits are concerned shall be in accordance with these rules.

(c) **Subordinate element.** An element (such as a crossarm, conductor, transformer or other equipment) added to a pole, tower, or structure, shall meet all the requirements of these rules but does not require any change in like elements already existing except where the added element is related in buckarm construction to an existing arm, in which case all construction on the related arms shall meet the requirements of these rules. A crossarm, pole, tower, or other structure to which any subordinate element is added shall meet the strength safety factor requirements specified in these rules.

(2) **Replacement of poles, towers, or other structures.** The replacement of poles, towers, or other structures is considered to be reconstruction and requires adherence to all strength and clearance requirements of these rules. The clearances of the spans adjacent to the new support need not be changed but the new support shall be such that when the adjacent support is replaced, the span between will meet all the requirements of these rules. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-022 Applicability of rules—Restoration of clearances. The restoration of clearances originally established prior to the effective date of these rules, where the original clearance has been reduced by additional sagging or other causes, is not considered to be reconstruction and the reestablished clearance shall conform to the requirements of the rules in effect at the time that the original clearance was established. The changing of clearance for any other purpose is reconstruction and clearances so changed shall comply with these rules where they apply to reconstruction. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-025 Applicability of rules—Lines constructed prior to these rules. These rules shall not apply to the use of existing electrical installations during their lifetime provided they are maintained in good condition and in accordance with the applicable safety factor requirements and the rules in effect at the time they were installed, and provided that reconstruction shall conform to the rules as herein provided. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-028 Applicability of rules—Reconstruction or alteration. In the interest of safety, the supervisor may order the reconstruction or alteration of existing lines or equipment. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-031 Applicability of other standards. If the regulations herein contained fail to provide a rule governing a particular situation, but separately accepted standards of the state of Washington do provide an applicable rule, then the rule of the safety standards here listed shall prevail.

General Safety Standards

Safety Standards for Construction Work

National Electrical Code

Rules and Regulations for Installing Electric Wires and Equipment

Electrical Workers Safety Rules

Communication Workers Safety Rules [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-034 Design, construction and maintenance. Electrical supply and communication systems shall be of suitable design and construction for their intended use, regard being given to the conditions under which they are to be operated, and shall be maintained in a condition which will enable the furnishing of safe, proper and adequate service. The owners and employees of such systems shall at all times exercise due care to reduce to a minimum the hazard of accidental injury, to their own or fellow employees, to the public and other utilities, due to their installations.

All construction shall be done in such a manner that the operations of other utilities will be interfered with as little as possible and no conditions unusually dangerous to workmen, pedestrians or others shall be established. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-037 Limiting conditions specified. The requirements specified in these rules as to spacing, clearance, and strength of construction are limiting conditions expressed as minimum or maximum value as indicated. In cases where two or more requirements establish limiting conditions, the most stringent conditions shall be met, thus providing compliance with other applicable conditions. Greater strength of construction and more ample spacing and clearances than herein specified may be desirable in some cases and may be provided accordingly if other requirements are not violated in so doing. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-040 Waiving of rules. These rules are intended to apply to all electrical installations except as modified or waived by the supervisor of the division of safety. They are intended to be modified or waived wherever any rules are shown to be impracticable, such as involving expense not justified by the protection secured; provided equivalent or safer construction is secured in other ways. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-043 Exemptions or modifications. If in a particular case or a special type of construction, exemption from or modification of any of the requirements herein is desired, the supervisor of the division of safety shall consider an application for such exemption or modification when accompanied by a full statement of conditions existing and the reasons why such exemption or modification is asked and is believed to be justifiable, and shall render a decision. It is to be understood that unless otherwise ordered, any exemption or modification so granted shall be limited to the particular case or the special type of construction covered by the application. Other methods of construction and installation than those specified in these rules may be used as experiments to obtain information if done with the permission of the supervisor.

It may sometimes be necessary to modify or waive certain rules in cases of temporary installations or installations which are soon to be discarded or reconstructed. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-046 Emergency. In cases of emergency or pending a decision of the supervisor of the division of safety, the person responsible for the installation may decide as to modification or waiver of any rule, subject to review by the supervisor, but shall first notify all parties directly concerned in advance of construction. Such emergency construction shall be brought into conformity with the rules, at the earliest possible date. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-049 Saving clause. The supervisor of the division of safety reserves the right to suspend any of the provisions of these rules in specific cases when such a change is in the interest of safety.

Compliance with these rules is not intended to relieve any utility from statutory requirements. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-052 Cooperation to avoid conflicts. Any party contemplating construction or reconstruction which would create a conflict with a line of another party shall notify the party or parties owning or operating the other line, in advance of such construction, giving full information as to the location and character of the proposed construction, and the parties concerned shall cooperate with a view of avoiding, or, if this is impracticable, of minimizing the hazard. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-055 Joint use of poles. (1) Joint use of poles shall be given consideration by all interested parties where construction or reconstruction is involved and where used it shall be subject to the appropriate grade of construction as specified in these rules. Nothing herein shall be construed as requiring joint use of the same poles, or as granting authority for the use of any poles without the owner's consent.

(2) Each party should definitely designate its space requirements on joint poles, which space shall not be occupied without consent, by equipment of any other party. [§ 2 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-058 Rules covering methods of protective grounding of circuits, equipment, and lightning arresters for stations, lines, and utilization equipment—Scope. (1) The following rules apply to the grounding of all lightning arresters except those on communication circuits, and of all circuits, equipment, or wire raceways when the grounding is intended to be a permanent and effective protective measure.

(2) They do not apply to the grounded return of electric railways, nor to the grounding of lightning protection wires which are independent of electric circuits or equipment. These rules do not require that grounding shall be done, but cover the methods for protective grounding. The rules requiring grounding, in accordance with the methods specified below, are included under the various parts of this code. [§ 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-061 Rules covering methods of protective grounding of circuits, equipment, and lightning arresters for stations, lines, and utilization equipment—Point of attachment of grounding conductor.

(1) **Direct-current distribution systems.** Direct-current systems which are to be grounded shall have the grounding connection made at one or more supply stations but not at individual services and not elsewhere on interior wiring. In three-wire direct-current systems the ground connections shall be made on the neutral.

(2) **Alternating-current distribution systems.** In alternating-current systems the ground connection shall be made at the building service or near the transformer (or transformers) either by direct ground connection (through water-piping system or artificial ground, see WAC 296-44-067) or by the use of a system ground wire to which are connected the grounded conductors of many secondary mains and which is itself effectively grounded at intervals that will fulfill, for any secondary utilizing the system ground wire, the resistance and current-carrying requirements of these rules.

If the secondaries of transformers are supplying a common set of mains, fuses, if installed, shall be located only at such points as not to cause the loss of the ground connections after any fuses in the transformer circuits or mains have been blown.

Alternating-current secondary circuits supplied from a transformer outside the building shall not be grounded inside buildings except at the service entrance.

In single-phase, three-wire systems the ground shall be on the neutral conductor. In two-wire single-phase and in two- or three-phase systems the ground shall be made at that point of the system which brings about the lowest voltage from ground of unguarded current-carrying parts of connected devices. Where one phase of a two- or three-phase system is used for lighting, that phase should be grounded and at the neutral conductor, if one is used.

In the absence of direct grounds at all building services, ground connections shall be made to the grounded neutral or other grounded conductor of a secondary system supplying more than one utilization equipment, at intervals that will fulfill the resistance requirements of WAC 296-44-073(1).

(3) **Current in grounding conductor.** Grounds shall be so arranged that under normal conditions of service there will be no objectionable flow of current over the grounding conductor.

The temporary currents set up under accidental conditions, while the grounding conductors are performing their intended protective functions, are not to be considered as objectionable.

If an objectionable flow of current occurs over a grounding conductor, due to the use of multiple grounds, (1) one or more of such grounds shall be abandoned, or (2) their location shall be changed, or (3) the continuity of the conductor between the grounding connections shall be suitably interrupted, or (4) other means satisfactory to the administrative authority shall be taken to limit the current.

(4) **Equipment and wire raceways.** Metal boxes, cabinets and fittings, or noncurrent-carrying metal parts of other fixed equipment, if metallically connected to grounded cable armor or metal raceway, are considered to be grounded by such connection. Where the metal enclosure of a wiring system is used as part of the protective grounding, the electrical continuity of the enclosure shall be assured.

For conduit, armored cable, or metal raceways the ground connection shall be as near as practicable to the point where the conductors in the raceway system concerned received their supply.

(5) **Service conduit.**

When the service conduit is grounded, its grounding wire shall be run directly from it to the ground connection. The interior conduit, armored cable, or metal raceways, if well bonded to the service conduit, grounded as provided in this rule, needs no additional ground connection. [§ 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-064 Grounding conductor. (1) **Material and continuity.** In all cases the grounding conductor shall be of copper or of other metal which will not corrode excessively under the existing conditions and, if practicable, shall be without joint or splice. If joints are unavoidable they shall be so made and maintained as to conform to the resistance requirements of WAC 296-44-073.

In no case shall a fuse or automatic circuit-breaker be inserted in the grounding conductor or connection except in a ground connection from equipment where its operation will result in the automatic disconnection from all sources of energy of the circuit leads connected to equipment so grounded; no switch shall be so inserted except in plain sight, provided with distinctive marking and effectively isolated from unqualified persons. (See also WAC 296-44-061(2) par. 2).

For lightning arresters and ground detectors the grounding conductor shall be as short and straight as practicable and free from sharp bends.

(2) **Size and capacity.** The grounding conductor shall conform to the following:

(a) For direct-current circuits. A grounding conductor for a direct-current supply system shall have a current-carrying capacity not less than that of the largest

conductor supplied by the system and in no case less than that of No. 8 copper.

(b) For alternating-current circuits. A grounding conductor for an alternating-current system shall have a current-carrying capacity not less than one-fifth that of the conductor to which it is attached and in no case less than that of No. 8 copper.

(c) For instrument transformers. The grounding conductor for instrument cases and secondary circuits of instrument transformers shall not be smaller than No. 12 if of copper or, if of other metal, shall have equivalent current-carrying capacity.

(d) For lightning arresters. The grounding conductor or conductors shall have a current capacity sufficient to insure continuity and continued effectiveness of the ground connection under conditions of excess current caused by or following discharge of the arrester. No individual grounding conductor shall have less conductance than No. 6 (0.162-inch) copper wire.

(e) For raceways and equipment. The current-carrying capacity of grounding conductors for equipment, raceways, cable armor, and other metal enclosures for wires, when provided with overcurrent protection, shall be sufficient to provide adequate draining of fault current during the time required for the protective device to operate. Where connected to artificial electrodes, the grounding conductor need not be larger than No. 6 copper wire or its equivalent. If no fuse or automatic circuit-breaker is provided, the capacity of the grounding conductor shall be determined by the design and operating conditions of the circuit, but shall not be smaller than No. 8.

(f) For portable and pendent equipment. For grounding portable or pendent equipment, the conductors to which are protected by fuses or circuit-breakers rated or set at not exceeding 15 amperes, No. 18 copper wire may be used. For grounding portable or pendent equipment protected at more than 15 amperes, see preceding paragraph.

(3) **Mechanical protection and guarding against contact.** Where exposed to mechanical injury, the grounding conductor shall be protected by substantial conduit or other guard. Guards for lightning-arrester grounding conductors shall be of nonmagnetic material unless the grounding conductor is electrically connected to both ends of the guard.

If the resistance of the ground connection is in excess of three ohms, the grounding conductor, except in rural districts, shall be protected and guarded by being inclosed in insulating conduit or molding to protect persons from injury by coming in contact with it.

Note: Such a high resistance may exist where artificial grounds are necessarily permitted in lieu of the preferable grounds to buried metallic water-piping systems.

Mechanical protection and insulating guards should extend for a distance of not less than 8 feet above any ground, platform, or floor from which grounding conductors are accessible to the public.

Note: Insulating mechanical protection is advisable for single arrester grounds, even when the connection is

made to a water-piping system, and has therefore a low resistance, since a single connection is liable to be accidentally broken.

Even where ground connections have a resistance not exceeding that specified in WAC 296-44-073 and no guard is therefore provided (or as an additional protection to persons even where guards are used), artificial grounds may be arranged to minimize the potential gradient along the surface of the earth by use of radial connecting wires underneath the earth surface or by other suitable means.

A grounding conductor for a circuit shall be guarded as required for current-carrying conductors of the circuit.

Exception 1: A grounding conductor for a circuit having at least two ground connections, where such conductor is entirely outside buildings and has strength and current capacity not less than No. 8 (0.1285-inch) cop-wire.

Exception 2: In stations substantial bare ground buses may be used.

(4) **Underground.** Wires used for grounding conductors, if laid underground, shall, unless otherwise mechanically protected, be laid slack to prevent their being readily broken, and shall have joints carefully painted or otherwise protected against corrosion.

(5) **Common grounding conductor for circuits, metal raceways, and equipment.** The grounding conductor of an interior wiring system may be used also as the grounding conductor for equipment, conduit, and other metal raceways or enclosures for conductors, including service conduit or cable sheath and service equipment, provided such grounding conductor meets the current-carrying-capacity requirements for service raceways, as specified in subsection 2 above; and provided further, that the secondary distribution circuit supplying the interior wiring system has at least one additional ground at the transformer or elsewhere. [§ 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-067 Ground connections. (1) The ground connection shall be permanent and effective, and be made as indicated below, but always to water-piping systems, if available.

(2) **Piping systems.** For circuits, equipment, and arresters at supply stations, connections shall be made to all available active metallic underground water-piping systems between which no appreciable difference of potential normally exists, if the pipe is of sufficient capacity, and to one such system if appreciable differences of potential do exist between them. At other places connections shall be made to at least one such system, if available. Gas piping should be avoided for circuit grounding wherever practicable.

Note: The protective grounding of electric circuits and equipment to waterpipe systems in accordance with these rules should always be permitted, since such grounding offers the most effective protection to life and property and is not injurious to the piping systems.

Ground connections from circuits should not be made to jointed piping within buildings except water piping.

(3) **Alternate methods.** Where underground metallic piping systems are not available, other methods which will secure the desired permanence and conductance may be permitted. In many cases metal well casings, and similar buried metal structures of considerable extent will be available and may be used in lieu of extended buried water-piping systems.

In some cases ground connection may be made to the steel frame of a building containing the grounded circuits or equipment, to which frames of machines and other noncurrent-carrying surfaces should also then be connected. In such cases the building frame should be itself well grounded by effective connection to the ground. This may require artificial grounding for steel-frame buildings supported on masonry or concrete footings.

(4) **Made electrodes.** If resort must be had to made (buried or driven) electrodes their number should be determined by the following requirements:

(a) Not more than one such ground is required for lightning arresters, except where needed for large current capacity.

(b) At least two grounds are required for low-voltage alternating-current distribution circuits at transformers or elsewhere, except as specified in paragraph (c) following.

(c) Where no part of the circuit or equipment protected can be reached by persons while they are standing on the ground or damp floors, or by persons while touching any metallic piping to which the grounding conductor is not effectively connected, a single made electrode may be used even if its resistance exceeds that specified in WAC 296-44-073. In such cases it is desirable to provide guards for the grounding conductor in accordance with WAC 296-44-064(3) wherever it is otherwise accessible.

(5) **Grounds to railway returns.** Protective ground connections should not be made to railway negative-return circuits when other effective means of grounding are available, except ground connections from electric-railway lightning arresters. When ground connections are of necessity made to the grounded track return of electric railways, they shall be made in such a manner as not to afford a metallic connection (as indirectly through a grounded neutral with multiple grounds) between the railway return and the other grounded conducting bodies (such as buried piping and cable sheaths).

Note: This rule does not prohibit the making of drainage connections (which are not protective grounds) between piping systems and railway negative-return circuits for the prevention of electrolysis.

Multiple protective ground connections from other circuits to railway returns should be avoided; and where multiple artificial grounds are made on such other circuits near such railway returns, they should be so arranged as to prevent the flow of any considerable current in and between such connections, which flow would reduce their effectiveness, or otherwise cause damage. [Rule 93C (codified as subsection (4)), filed 10/30/64,

effective 12/1/64; Subsections A through D (codified as (1), (2), (3), (4) and (5)), filed 3/23/60, effective 12/1/58; Rule 93C, § 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-070 Method. (1) **Piping.** The point of attachment of a grounding conductor to a water-piping system shall be on the street side of the water meter, or on a cold-water pipe of adequate current-carrying capacity, as near as practicable to the water-service entrance to the building or near the equipment to be grounded, and shall be accessible except by special permission. If the point of attachment is not on the street side of the water meter, the water-piping system shall be made electrically continuous by bonding together all parts between the attachment and the pipe entrance which are liable to become disconnected, as at meters and service unions. If water meters are located outside buildings or in concrete pits within buildings where piping connections are embedded in concrete flooring, the ground connections may be made on the building side of the meters. Gas-piping systems within buildings shall not be used for purposes of this rule where water pipes are readily available. Gas piping may serve as the grounding electrode for fixtures located at a considerable distance from water piping. Where gas piping is so used it shall be bonded to the water-piping system at the point of entrance of water piping. (See WAC 296-44-067(2).)

(2) **Ground clamps.** The ground connection to metal-piping systems shall be made by means of an approved clamp firmly bolted to the pipe after all rust and scale have been removed, or by means of a brass plug which has been tightly screwed into a pipe fitting or, where the pipe is of sufficient thickness, screwed into a hole in the pipe itself, or by other equivalent means.

The grounding conductor shall be attached to the clamp or to the plug by means of solder or by an approved solderless connector. The point of connection shall be as readily accessible as practicable.

Note: With bell-and-spigot-joint pipe it may be necessary to connect to several lengths where circuits or equipment of large current capacity are being grounded.

(3) **Contact surfaces.** If conduit, couplings, or fittings having protective coating of nonconducting material, such as enamel, are used, such coating shall be thoroughly removed from threads of both couplings and conduit and such surfaces of fittings where the conduit or ground clamp is secured, in order to obtain the requisite good connection. Grounded pipes shall be free from rust, scale, etc., at the place of attachment of ground clamp. Conduits, other metal raceways, and the armor of cables shall be securely fastened in outlet boxes, junction boxes, and cabinets, so as to secure good electrical connection.

In ice houses, packing plants, etc., where a great deal of moisture is present and where conduits are attached to metal cabinets, cut-out, pull, or junction boxes, compensators, etc., by means of lock nuts and bushings, these conduits should be bonded together.

(4) **Made electrode grounds.** Where made electrodes are used, they shall, as far as practicable, be embedded below permanent moisture level. Made electrodes shall be of materials or combinations of materials which shall not corrode excessively under the existing conditions.

Buried-plate electrodes shall present not less than two square feet of surface to exterior soil. Electrodes of plate copper shall be at least 0.06 inch in thickness. Electrodes of iron or steel plates shall be at least one-quarter inch in thickness.

Electrodes of iron or steel pipe shall be galvanized and not less than one-half inch (nominal size). Electrodes of rods of steel or iron shall be at least five-eighths inch minimum cross-sectional dimension. Approved rods of nonferrous materials or their approved equivalent used for electrodes shall be not less than one-half inch in diameter. Driven electrodes of pipes or rods, if of less than standard commercial length, shall preferably be of one piece, and, except where rock bottom is encountered, shall be driven to a depth of at least eight feet regardless of size or number of electrodes used. Such pipes or rods shall have clean metal surfaces and shall not be covered with paint, enamel, or other poorly conducting materials.

Made electrodes may be wire attached to the pole previous to the setting of the pole. The wire shall be of copper or of other metals which will not corrode excessively under the existing conditions and shall have a continuous bare or exposed length below ground level of not less than twelve feet, shall extend to the bottom of the pole, and shall be not smaller than No. 6. [Subsection D (codified as (4)), filed 10/30/64, effective 12/1/64; Subsections A through C (codified as (1), (2), (3)), § 9 (part), filed 3/23/60, effective 12/1/58; Rule 94D, § 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-073 Ground resistance. (1) **Limits.** The combined resistances of the grounding wire and the connection with the ground shall not exceed 3 ohms for water-pipe connections nor 25 ohms for artificial (buried or driven) grounds. Where it is impracticable to obtain, with one electrode, artificial-ground resistance as low as 25 ohms, this requirement shall be waived, and two or more electrodes, at least 6 feet apart, shall be provided.

(2) **Checking.** The resistance of station grounds should be checked when made.

Note: With artificial grounds this check may be made by measuring the voltage between the grounded point of the circuit or the grounded frame of the equipment, or the grounded point of the lightning arrester, and an auxiliary metal reference rod or pipe driven into the ground, while a measured current is flowing through the ground connection and any exposed metal piping or other artificial ground not less than 20 feet distant.

If the station ground is to water piping, the check may be made with current flowing through the water piping and some independent piping system or artificial ground not less than 20 feet distant.

The auxiliary rod or pipe should be at least 10 feet from any artificial ground or piping systems through which the measured current is made to flow.

(3) All ground connections shall be inspected periodically. Ground connections on distribution circuits should, when installed, be tested for resistance unless multiple grounding is used. [§ 9 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-076 Separate grounding conductors and grounds. (1) **Grounding conductors.** Grounding conductors from equipment and circuits of each of the following classes, if required by these rules, shall be run separately to the ground or to a sufficiently heavy grounding bus or system ground cable which is well connected to ground at more than one place, except as provided in subsection (3) of this section and in WAC 296-44-415(3).

(a) Lightning arresters.

(b) Secondaries connected to low-voltage lighting or power circuits, except that if a secondary distribution system has multiple grounds, utilization equipment and wire enclosures may use the same grounding conductor.

(c) Secondaries of current and potential instrument transformers having primary voltages of more than 750 volts, and cases of instruments on these secondaries.

(d) Frames of direct-current railway equipment and of equipment operating in excess of 750 volts.

(e) Frames of utilization equipment or wire raceways other than covered by item (d), except as provided in item (b).

(f) Lightning rods.

(2) **Electrodes.** Where conditions require more than one made electrode ground, separate grounding conductors as well as separate grounding electrodes shall be used except that a single grounding conductor may be connected to a group of electrodes which have been bonded together for the purpose of lowering the resistance to ground of the group. This does not prohibit the bonding together of these separate made electrodes or groups of electrodes near the ground level.

(3) **Interconnection of primary arrester and secondary neutral.**

(a) **Solid interconnection.** The grounding conductor of a lightning arrester protecting a transformer which supplies a secondary distribution system may be interconnected with the grounded conductor of such secondary distribution system, provided that in addition to the direct grounding connection at the arrester either:

(i) The secondary has elsewhere a grounding connection to a continuous metallic underground water piping system; or

(ii) The secondary neutral (which may or may not be common with the primary neutral) has at least four ground connections in each mile of line in addition to a ground connection at each individual service.

(b) **Interconnection through spark gap.** Where the secondary is not grounded as in item 1, interconnection, if made, shall be through a spark gap having a 60-cycle breakdown voltage of at least twice the primary circuit voltage but not necessarily more than 15 kilovolts, and there shall be at least one other ground on the grounded conductor of the secondary that is at least 20 feet distant from the lightning-arrester grounding electrode. [Subsection B (codified as (2)), filed 10/30/64, effective

12/1/64; Subsections A and B (codified as (1) and (3)), § 9 (part), filed 3/23/60, effective 12/1/58; Rule 96B, § 9 (part), filed 3/23/60, effective 12/1/58.]

INSTALLATION AND MAINTENANCE OF ELECTRIC SUPPLY STATIONS AND EQUIPMENT

WAC 296-44-079 Protective arrangements of stations and substations—Scope of the rules. The following rules apply to the electric supply equipment of indoor and outdoor stations and substations. Provided the equipment is in separate rooms or enclosures, under control of properly qualified persons and accessible only to such persons, they also apply to similar equipment, including generators, motors, storage batteries, transformers, lightning arresters, etc., if installed in factories, mercantile establishments, vehicles, or elsewhere.

Similar equipment under control of properly qualified persons, and accessible only to such persons, is exempted under the following conditions: (1) If the voltage does not exceed 150 volts to ground.

(2) If the voltage is not more than 550 volts between conductors, and the power utilized does not exceed 3,200 watts. [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-082 Protective arrangements of stations and substations—General requirements. (1) **Enclosure of rooms and spaces.** Rooms and spaces shall be so arranged with fences, screens, partitions, or walls as to prevent entrance of unauthorized persons or interference by them with equipment inside, and entrances not under observation of an authorized attendant shall be kept locked. Signs prohibiting entrance to unauthorized persons shall be displayed at entrances.

(2) **Rooms and spaces.** All rooms or spaces in which electric supply equipment is installed shall comply with the following requirements:

(a) **Fireproof construction.** They shall be, as far as practicable, noncombustible.

(b) **Storage and manufacturing processes.** They shall be used neither for the storage of material nor for manufacturing processes causing hazard to electrical operators, except those materials or processes attendant upon the production or distribution of a supply of electric energy.

(c) **Hazardous conditions.** They shall be free from combustible dust or flyings, inflammable gas, or acid fumes, in dangerous quantities. (For battery rooms, see WAC 296-44-142 through 296-44-166; for auxiliary equipment in hazardous locations, see WAC 296-44-121.)

(d) **Ventilation.** They should be well ventilated.

(e) **Moisture and weather.** They should be dry. In outdoor stations or in wet tunnels or subways, all live parts of equipment should be enclosed in weather-proof cases, unless the equipment is suitably designed to withstand the prevailing atmospheric conditions.

(3) **Rotating machinery.** Rotating machinery shall be installed upon suitable supports or foundations and if necessary secured in place. [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-085 Protective arrangements of stations and substations—illumination. (1) **Under normal conditions.** Rooms and spaces where electric apparatus or machinery is located shall have means for artificial illumination at intensities not less than given in Table 1. The means of illumination shall be maintained ready for use at all times.

TABLE 1.—Illumination intensities*

Location	Minimum* Footcandles
Switchboard instruments, gages, switches, etc	3
Switchboards with no exposed live parts	1
Storage—battery room	1
Generating room, boiler room, pump room	3
Stairways and passageways where there is moving machinery, exposed live parts, hot pipes, etc. (measured at floor level)	3
Any traversed space (measured at floor level)	1

*The values are to be measured at working surfaces, except as stated.

For industrial interiors see Washington state general safety standards.

Note: It is not intended that this rule should require permanent lighting in switch cells and similar small spaces occupied by electric apparatus where permanent lighting is impracticable. The code of lighting factories, mills, and other work places includes general standards of illumination required from the point of view of safety.

(2) **Emergency source.** A separate emergency source of illumination, from an independent generator, storage battery, gas main, lanterns (the latter two should never be used in battery rooms), or other suitable source, shall be provided in every station where an attendant is located.

(3) **Fixtures and pendants.** Arrangements of permanent fixtures and plug receptacles shall be such that portable cords need not be brought into dangerous proximity to live or moving apparatus. All lamps shall be arranged to be controlled, replaced, or trimmed from safely accessible places.

Pendant conductors shall not be installed where they can be readily moved so as to bring them in contact with live parts of electric supply equipment.

(4) **Attachment plugs.** Portable conductors shall be attached to fixed wiring only through separable attachment plugs which will disconnect all poles by one operation. (See WAC 296-44-625 et seq., for portables and pendants.) [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-088 Protective arrangements of stations and substations—Floors, floor openings, passageways, stairs. (1) **Floors.** Floors shall have even surfaces and afford secure footing. Projecting nails, loose boards, uneven or greasy wood floors, and slippery floors should be avoided.

Note: Otherwise slippery floors or stairs should be provided with antislip treads.

(2) **Passageway.** Passageways (including stairways) and working spaces shall be unobstructed, and (except such as are used solely for infrequent inspection, construction, and repair) shall, where possible, provide at least 6.5 feet of headroom. (See WAC 296-44-115 for working space.)

(3) **Railings.** All floor openings over 18 inches deep and raised platforms over 4 feet high shall be provided with suitable railings.

Except for loading platforms, such rails are recommended where height exceeds 18 inches, especially where they are adjacent to live or moving parts or the working space on the platform is restricted.

(4) **Stair guards.** All stairways consisting of four or more risers shall be provided with handrails.

For very long and steep stairs occasional landings or turns are recommended.

(5) **Continuity.** The heads of permanent ladders shall be provided with guards such as gates or sliding pipe sections whenever the heading breaks the continuity of a railing adjacent to working space.

For very long ladders occasional landings, turns, or safety loops are recommended.

(6) **Floor toe boards.** All floor openings over 6 feet deep, and the edges of all raised platforms over 6 feet high, shall, where possible, be provided with suitable toe boards.

(7) **Stair toe boards.** Toe boards shall, where practicable, be arranged at back of stairway treads where over exposed live or moving parts or over working spaces, passageways, or other stairways. [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-091 Protective arrangements of stations and substations—Exits. (1) **Clear exits.** Each room or space and each working space about equipment shall have suitable means of exit which shall be kept clear of all obstructions.

(2) **Double exits.** If the plan of the room or space and the character and arrangement of equipment are such that an accident would be liable to close or make inaccessible a single exit, as in the case of long narrow rooms, platforms, passageways, spaces behind switchboards, or wire and pipe tunnels, a second exit shall be provided. [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-094 Protective arrangements of stations and substations—Fire-fighting apparatus. (1) **Fire extinguishers.** Adequate approved fire-extinguishing appliances shall be conveniently located and conspicuously marked. Any such appliances which have not been listed by Underwriters' Laboratories, Inc. for use on live parts should be plainly and conspicuously marked with a warning to that effect.

(2) **Temperature conditions.** Fire extinguishers shall not be installed in locations subject to conditions of high or low temperature which will reduce their effectiveness.

Note: Carbon-tetrachloride extinguishers are not adversely affected by temperatures between 60° C (140° F.) and minus 40° C (-40° F). [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-097 Protective arrangements of stations and substations—Oil-filled apparatus. For the purposes of these rules oil-filled apparatus is divided into three classes each of which requires different treatment: (1) Oil switches and circuit-breakers, (2) transformers, induction regulators, etc., and (3) lightning arresters. The necessary safety precautions depend largely on whether they are located in buildings or outdoors.

(1) **Oil switches or circuit-breakers.** Oil switches or circuit-breakers and their transformers, regulators, reactors, or other associated equipment should be separated from other apparatus by adequate fire-resistant barriers, or otherwise adequately isolated.

Where switches or switch compartments are constructed to prevent an appreciable amount of oil being thrown outside of the compartment, exterior drainage or storage systems are not necessary.

If located outdoors, they should be adequately isolated.

If located near building walls, these should be of fire-resistive construction and should have doors or windows so located and arranged that burning oil is not liable to pass through them to inflammable material or apparatus.

Note: It should be recognized that oil-switch or circuit-breaker failures may depend upon the size and rupturing capacity of the switch or circuit-breaker and the short-circuit duty that may be required of it. The short-circuit current depends on the generating capacity supplying the system on which the switch or circuit-breaker is used as modified by the current-limiting characteristics of the system or by special apparatus installed for that purpose. By "generating capacity" is meant all of the apparatus contributing to the short-circuit current.

(2) **Transformers, induction regulators, etc., containing a liquid that will burn.** If transformers, induction regulators, etc., are in buildings, floors and floor drains should be so arranged that oil will quickly collect in a suitable drainage or storage system provided for the purpose either inside or outside of the building as may be advisable. If the apparatus contains large quantities of oil, each unit or group should preferably be placed in a separate fireproof compartment suitably ventilated.

If located outdoors, they should be adequately isolated. Provision should be made for quickly draining away to a safe distance any oil that may be spilled. This may be done by ditches and drains or the oil may be absorbed and danger of spreading removed by paving the yard around the transformers or other devices with cinders or other absorbent material to a depth of several inches.

If located in buildings, transformer tanks containing large quantities of oil shall, where practicable, be so arranged that approved firequenching material may be introduced above the oil inside the tank or in the

surrounding compartment, except where tanks are completely filled with oil or where the space above the oil is filled with an inert gas.

(3) **Transformers, induction regulators, etc., containing a liquid that will not burn.** If in buildings, transformers, induction regulators, etc., filled with a liquid that will not burn should comply with WAC 296-44-178.

(4) **Lightning arresters.** If located in buildings, lightning arresters containing oil should be separated from other equipment by fire walls adequate to completely isolate them in case of fire.

If located outdoors, they should be adequately isolated. Provision for quickly draining away oil should be made as indicated for transformers in (2) above. [§ 10 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-100 Protective arrangements of equipment—General requirement. All electric supply equipment shall be of such construction and so installed and maintained as to reduce the life hazard as far as practicable. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-103 Protective arrangements of equipment—Inspections. (1) **Regular equipment.** Electric supply equipment shall comply with these safety rules when placed in service, and shall thereafter be periodically cleaned and inspected. Defective equipment shall be put in good order or permanently disconnected. Defective wiring, when hazardous, shall be repaired or removed.

(2) **Idle equipment.** Infrequently used equipment or wiring maintained for future service should be thoroughly inspected before use to determine its fitness for service.

(3) **Emergency equipment.** Equipment or wiring maintained for emergency service should be periodically inspected and, where necessary, tested to determine its fitness for service.

(4) **New equipment.** New equipment should be thoroughly inspected before being put in service. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-106 Protective arrangements of equipment—Guarding shaft ends, pulleys, and belts, and suddenly moving parts. (1) **Transmission machinery.** This code is supplemented by the General Safety Standards of Washington, which specify methods for safeguarding pulleys, belts and other equipment used in the mechanical transmission of power.

(2) **Suddenly moving parts.** Parts of equipment which move suddenly in such a way that persons in the vicinity are liable to be injured by being struck, such as handles and levers of circuit-breakers, shall be guarded or isolated. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-109 Protective arrangements of equipment—Protective grounding. (1) **Grounding method.** All grounding which is intended to be a permanent and effective protective measure, such as lightning arrester grounding, grounding of circuits, equipment, or wire raceways, shall be made in accordance with the

methods specified in WAC 296-44-058 through 296-44-076, methods of protective grounding.

(2) **Protective grounding or isolation of noncurrent-carrying metal parts.** All electric supply equipment, if operating at more than 150 volts to ground, or if in hazardous or damp locations, regardless of voltage, shall have the exposed noncurrent-carrying parts, such as frames of generators and switchboards, cases of transformers, lightning arresters and switches, and operating levers, permanently grounded or isolated.

It is recommended that exposed noncurrent-carrying parts of electric apparatus operating at 150 volts or less to ground be permanently grounded.

It is recommended that all metallic guards (including rails, screens, etc.) about electric supply equipment should be permanently grounded. Except in hazardous or damp locations, exposed noncurrent-carrying parts of equipment operating at more than 150 volts to ground may be left ungrounded and either isolated, or guarded, or provided with insulating mats as required for live parts at the same voltage. Such isolation, guarding, or mats should be so arranged that persons cannot inadvertently touch these parts while also touching a grounded surface.

(3) **Grounding equipment during repairs.** Electric equipment or conductors normally operating at more than 750 volts between conductors on or about which work is occasionally done while separated from a source of electric energy by switches or disconnectors only, shall be provided with some means, such as switches, connectors, or readily accessible ground conductor for grounding them. (See Electrical Workers Safety Rules; chapter 296-45 WAC.) [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-112 Protective arrangements of equipment—Guarding live parts. (1) Where required.

(a) Guards shall be provided for all parts exceeding 300 volts to ground unless the boundary of the guard zone around the part has a vertical clearance of more than 7 feet 6 inches for voltages up to 7,500, and 8 feet 6 inches for voltages of more than 7,500, above any permanent supporting surface for workmen, or a horizontal clearance of more than 3 feet from the nearest edge of any such surface, or both. This includes parts exposed through windows, wall openings, etc.

Exception: Guards need not be provided where it is necessary to permit routine inspection of rotating equipment as required under operating conditions.

Note: The rule applies to the electric parts energized or considered available for service in temporary or partially completed installations, as well as to permanent installations.

Definitions: The guard zone means the space of minimum clearance from guards to electric parts where guards may be installed by workmen without definite engineering design. The radius of this zone varies with the voltage as specified in column 4 of Table 2. (See Electrical Workers Safety Rules for working clearances about live parts; chapter 296-45 WAC.)

"Permanent supporting surface for workmen" includes floors, platforms, or structures used regularly and frequently by workmen for inspections and maintenance near live adjacent parts; runways, ladders, stairways, etc.

(b) Parts over or near frequently traveled passageways through which material may be carried, or in or near spaces such as corridors, storerooms, boiler rooms, etc., used for nonelectrical work, should, where practicable, be guarded or given clearances in excess of those specified such as may be necessary to secure reasonable safety. The guards should be substantial; should, where practicable, completely shield or enclose without openings the parts; and when in spaces used for nonelectrical work should be removable only by means of tools or keys.

(c) Parts of indeterminate potential, such as telephone wires exposed to induction from high-tension lines, ungrounded neutral connections, ungrounded frames, ungrounded parts of lightning arresters, ungrounded instrument cases connected directly to the high-voltage circuit, etc., shall be classified and, where practicable, guarded on the basis of the maximum voltage which may be present.

(2) **Strength of guards.** Guards shall be sufficiently strong and shall be supported rigidly and securely enough to prevent them from being displaced or dangerously deflected by a man slipping or falling against them.

TABLE 2.—Minimum clearances from live parts

Voltage between phases	1		2		3		4	
	Minimum vertical clearance of unguarded parts		Minimum horizontal clearance of unguarded parts		Minimum clearance from guards to parts.		Radius of guard zone	
	Feet	Inches	Feet	Inches	Inches		Inches	
600	7	8	3	2			2	
2,300	7	9	3	3			3	
6,600	7	10	3	4			4	
11,000	9	0	3	6			6	
22,000	9	3	3	9			9	
33,000	9	6	4	0			12	
44,000	9	10	4	4			16	
66,000	10	5	4	11			23	
88,000	11	0	5	6			30	
110,000	11	7	6	1			37	
132,000	12	2	6	8			44	
230,000	15	0	9	0			72	
345,000	17	0	12	0			96	

Note.—Interpolate for intermediate values.

The clearances in column 4 of this table are not a requirement for definite engineering design of either apparatus or guards, but are solely for the guidance of workmen installing guards, without such design.

For example, the minimum clearances in the table above are not intended to refer to the clearances between live parts and the walls of the

cells, compartments, or similar enclosing structures. They do not apply to the clearances between bus bars and supporting structures, nor to clearances between the blade of a disconnecting switch and its base.

For the relation of the above clearance tables to the manufacture of electric apparatus, see discussion of subsection (1) of this section.

(3) Types of guards.

(a) Location or isolation. Parts having clearance equal to or greater than specified in (a) above are guarded by location. Parts are guarded by isolation when all entrances to enclosed spaces, runways, ladders etc., are kept locked or warning signs posted at all entrances, in which case no other permanent guards need be supplied.

(b) Grounded metal cable sheaths. These are suitable guards except where exposed to mechanical injury. Where so exposed metal conduit or other suitable guards should be provided.

(c) Railings. Railings are not substitutes for complete guards, and if used shall be located at a horizontal distance of at least 3 feet (and preferably not more than 4 feet) from the nearest point of guard zone, which is less than 7 1/2 feet above the floor.

(d) Shields or enclosures. Guards inside of the guard zone or less than 4 inches outside, shall completely enclose the parts from contact up to the heights listed in column 2 of Table 2. They shall not be closer to the live parts than listed in column 4 of Table 2, except when suitable insulating material is used with circuits of less than 7,500 volts. (See note under Table 2.) If more than 4 inches outside of the guard zone, the guards need not extend more than 7 1/2 feet above the floor. Covers or guards, which must at any time be removed while the parts they guard are alive, should be arranged so that they can not readily be brought in contact with live parts.

(e) Insulating covering on conductors or parts. The insulating covering on parts exceeding 750 volts to ground shall not be considered a protection. For parts less than 750 volts, positive barriers, enclosures, or similar arrangements are preferable, but in dry places where not exposed to mechanical injury, varnished-cloth tape, or other insulation suitable for the voltage involved may be used as a guard. The taping over connections shall be of a type and thickness suitable for the voltage involved. Friction tape is not acceptable as the sole protection.

Exception: On circuits not exceeding 7,500 volts between phases, when other guarding is impracticable, insulation suitable for the voltage involved may be used back of switchboards or in equivalent sheltered locations. Insulating mats or platforms shall be provided so that an operator can not readily touch the insulating covering without standing on the mats.

(f) Mats. Suitable insulating mat placed so that a person cannot inadvertently come in contact with the live parts without standing on the mat may be used in the following cases:

(i) Parts less than 750 volts to ground exposed at switchboards, switches, or on rotating machinery.

(ii) Disconnect switches less than 7,500 volts between phases mounted on back of switchboards or in similar sheltered locations when barriers are placed between each blade so as to extend beyond the disconnected parts

in any position. Other means of guarding may be used where convenient.

(iii) Ungrounded frames of existing high-voltage series generators.

(iv) As provided for in paragraphs (3)(e), and (3)(h), of this rule, mats should be of rubber or other suitable insulating material. In dry locations they may be of wood fastened with wood pins, cork matting, or heavy (1/4-inch) linoleum laid without joints and without metal fastenings. A "nonslip" surface should be maintained, and the mats should be laid and maintained so as to reduce the tripping hazard to a minimum.

Note: Beveled edges will help in many cases.

(g) Parts below supporting surfaces for persons. The supporting surfaces above live parts shall be without openings. Toe boards at least 6 inches high shall be provided at all edges.

(h) Special rules for plug-type switchboards. A mat is a suitable guard when placed so that the operator must stand on it when operating the plugs. Suitable guards on handles of all plugs shall be provided.

(4) Parts of less than 300 volts to ground. It is recommended that live parts of more than 150 volts to ground be enclosed or guarded when in exposed locations. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-115 Protective arrangements of equipment—Working space about electric equipment.

(1) **Where required.** Adequate and readily accessible working space with secure footing shall be maintained about all electric parts or equipment which require adjustment or examination if exposed while in service.

(2) **Width of working space.** The horizontal clearance from the farthest edge of the working space to the nearest live part of more than 300 volts to ground, exposed after removing guards, shall be not less than 3 feet plus the guard zone radius as given in column 4 of Table 2. (If the live parts are on only one side, column 3 of Table 2 gives the minimum permissible value for the total width of the free space.) See also WAC 296-44-088(2), for head room.

(3) **Elevated parts.** Clearance about normally elevated or isolated parts requiring occasional adjustment should be provided so the men need not come within the danger zone (see Electrical Workers Safety Rules; chapter 296-45 WAC), around adjacent energized parts, unless guarded in accordance with WAC 296-44-112 to 296-44-118, inclusive. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-118 Protective arrangements of equipment—Hazardous locations.

(1) **Enclosure of arcing and heating parts.** In locations where inflammable gas or inflammable flyings normally exist in dangerous quantities, all parts where sparking, arcing, or dangerous heating is liable to occur, shall be enclosed so as to reduce the hazards as far as practicable.

This enclosure shall be by one of the following methods:

(a) By placing in separate compartments or rooms.

(b) By using nonabsorptive, noncombustible casings of the solidly enclosed type when inflammable dust or flyings are present.

(c) By using nonabsorptive, noncombustible, explosion-proof casings when inflammable gas exists in dangerous quantities.

(2) **Grounding.** The metal frames and other exposed noncurrent-carrying metal parts of equipment in these locations shall be permanently grounded as specified in WAC 296-44-058 through 296-44-076. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-121 Protective arrangements of equipment—Shielding of equipment from deteriorating agencies. Suitable shields or enclosures shall be provided to protect exposed current-carrying parts, insulation of leads or electric devices or equipment where susceptible to injury by being installed directly under rotating equipment or in other locations where dripping oil, excessive moisture, steam, vapors, or similar agents exist. (For battery rooms see WAC 296-44-160.) [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-124 Protective arrangements of equipment—Identification. (1) **Equipment in general.** Electric supply equipment shall be suitably identified when necessary for safety. The identification may be by position, color, number, name plate, label, design, or other means, but the method of identification chosen shall be uniform throughout any one system. (See WAC 296-44-220(1) for switches.)

The voltage and intended use shall be shown if important.

Identification marks should not, if avoidable, be placed on removable covers or casings, such as instrument covers and disconnect compartment doors, where the interchanging of these removable parts might lead to accident.

(2) **Generators and motors.** Every generator, motor, transformer, or other piece of apparatus shall be provided with a name plate giving maker's name, the rating, normal full-load speed for rotating equipment, and the voltage. [§ 11 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-127 Rotating equipment (This includes generators, motors, motor-generators, and converters)—Speed-control and stopping devices. (1) **Speed limits for prime movers.** Prime movers driving generating equipment shall be provided with automatic speed-limiting devices, where harmful overspeed can otherwise occur, in addition to their governors, if necessary, as with some types of steam turbines.

(2) **Stops for rotating equipment.** Stopping devices, such as switches or valves which can be operated from locations convenient to machine operators, shall be provided for prime movers or motors driving generating equipment.

Devices which operate in such a way that the development of defects or their becoming inoperative will stop the units protected, should be used where practicable.

Controls to be used in emergency for machinery and electric equipment should be so located as to permit operation with a minimum of danger during such emergency. (See WAC 296-44-223 for fuses and circuit-breakers.)

(3) **Speed limit for motors.** Machines of the following types shall be provided with speed-limiting devices unless their inherent characteristics or the load and the mechanical connection thereto are such as to safely limit the speed, or unless the machine is always under the manual control of a qualified operator:

(a) Separately excited direct-current motors.

(b) Series motors.

(c) Motor-generators and converters which can be driven at excessive speed from the direct-current end, as by a reversal of current or decrease in load.

Note: The required limitation of speed may be obtained by the use of a relay, centrifugal switch, or other similar device which will cut off the supply of energy when excessive speed is attained.

(4) **Low-voltage or under-voltage protection.** All motors so employed or arranged that an unexpected starting of the motor is a hazard, except those with an emergency use, and where the opening of the circuit may cause a special hazard, such as exciter or condenser-pump motors, shall be equipped with low-voltage protection which instantaneously or after a predetermined delay will automatically cause and maintain the interruption of the motor circuit when the voltage falls below an operating value.

(5) **Adjustable-speed motors.** Adjustable-speed motors, if controlled by means of field regulation, shall be so equipped and connected that the field cannot be weakened sufficiently to permit a dangerous speed.

(6) **Protection of control circuits.** Where speed-limiting or stopping devices are electrically operated, the control circuits by which such devices are actuated shall be in conduit or otherwise suitably protected from mechanical injury, in accordance with WAC 296-44-190. [§ 12 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-130 Rotating equipment (This includes generators, motors, motor-generators, and converters)—Guards for live parts. (1) **Guards on rotating equipment.** Guards complying with WAC 296-44-112 shall be provided.

(2) **Access to live parts.** Where necessary, steps and handrails shall be installed on or about large machines to afford ready access to live parts which must be examined or adjusted during operation.

(3) **Frame switches.** Where switches are installed on the frames of generating equipment for the purpose of reducing inductive voltage in generator and converter field coils they shall be suitably constructed or guarded to prevent passers-by from inadvertently coming in contact with the live parts, to protect persons handling them, and to prevent their being accidentally opened or closed.

(4) **Arcing shields.** Suitable shields or barriers other than rails shall be provided where practicable to prevent

arcing on large commutators or any other parts of moving apparatus from injuring persons in the vicinity, as in the case of narrow working spaces located immediately above or beside such equipment.

Exception: Twenty-five-cycle apparatus of less than 150 volts to ground is exempted.

It is recommended that where suitable shields have not been installed, goggles should be available. [§ 12 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-133 Rotating equipment (This includes generators, motors, motor-generators, and converters)—Grounding machine frames. (1) **Grounding machine frames.** All frames of rotating electric equipment shall be permanently grounded except as permitted below and in WAC 296-44-109.

(2) **Coupled machines.** Where two or more machines, either of which operates at more than 150 volts to ground, are mechanically coupled together and the operator can touch the frames of more than one at a time, the frames of all such shall be permanently grounded or bonded together electrically.

(3) **Auxiliaries.** Exciters and auxiliary circuits electrically connected to generators or other machines of more than 750 volts to ground (with frames ungrounded) shall be installed, protected, and identified as machines and circuits of the same voltage as that of the machine for which they are auxiliaries. [§ 12 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-136 Rotating equipment (This includes generators, motors, motor-generators, and converters)—Deteriorating agencies. (1) **Protection required.** Suitable shields or enclosures shall be provided to protect exposed current-carrying parts, insulation of leads, balance coils, or other electric devices belonging to motors and generating equipment where installed directly under equipment or in other locations where dripping oil, excessive moisture, steam, vapors, or similar injurious agents exists.

(2) **Grounding.** The metal frames and other exposed noncurrent-carrying metal parts of equipment in these locations shall be permanently grounded. [§ 12 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-139 Rotating equipment (This includes generators, motors, motor-generators, and converters)—Motors. (1) **Control.** If the starting is caused automatically (not manually) as, for example, by a float switch, or if the starting device or control switch is not located close to the motor and all parts of the machinery operated, the starting arrangement shall be designed so that it can positively be kept open by means of locks or equivalent devices.

(2) **Motors in hazardous locations.** Motors with their auxiliary equipment, at which sparking or arcing or high temperature is liable to occur, if in rooms normally containing explosives, inflammable gas, or inflammable flyings, shall be so installed as to reduce the hazard by enclosure in an adequately ventilated separate compartment, by solidly enclosed or explosion-proof type of

equipment, or when to be protected against flyings only, by partitioning off a space or by a suitable boxing.

(3) **Motors exposed to dust.** Motors should be protected from dust. Enclosed-type motors are recommended in dusty places, being preferable to boxing.

(4) **Motors on wooden floors.** Where practicable, motors permanently located on wooden floors should be provided with suitable drip pans. [§ 12 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-142 Storage batteries—General.

(1) The provisions of this section are intended to apply to all stationary installations of storage batteries using acid or alkali as electrolyte, consisting of cells connected in series, with a nominal voltage in excess of 50 volts, and connected for service where so installed. (For exception, see WAC 296-44-148(2).)

(2) Nominal battery voltage shall be calculated on the basis of 2.0 volts per cell for lead-acid type and 1.2 volts per cell for alkali type. "End" or "Emergency" cells, held in reserve for connection into circuit only to maintain voltage during discharge, are not included in calculating nominal battery voltage.

(3) Two types of cell construction are recognized in this section, viz:

(a) The sealed type in which the only passage for the escape of gases from the interior of the cell is provided by a vent of effective spray-trap design adapted to trap and return to the cell, particles of liquid entrained in the escaping gases.

(b) the nonsealed type, in which gases escaping from the cell may carry entrained particles of liquid into the surrounding atmosphere.

Caution: Smoking, or the use of open flames, or of tools which may generate sparks, should be avoided except when cells are not actively gassing and when prior ventilation has been ample. Sparks from frictional or static electricity should be avoided as they may ignite the gas if discharged close to its source, as at the vent of a sealed-type cell during overcharging. The electrolyte of storage batteries, and spray containing electrolyte, are somewhat corrosive, particularly when concentrated by evaporation, and contact with body or clothes should be avoided. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-145 Storage batteries—Isolation.

Storage batteries should be so located as to be not accessible to other than properly qualified persons. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-148 Storage batteries—Ventilation.

(1) **Diffusion of gases.** Provision should be made for sufficient diffusion of the gases from the battery to prevent the accumulation of an explosive mixture.

(2) **Nonsealed type.** Batteries of the nonsealed type shall be located in separate rooms or enclosures so arranged as to prevent the escape into other rooms of objectionable quantities of electrolyte spray. This applies also to batteries of the nonsealed type not exceeding 50 volts nominal voltage if the capacity at the 8-hour discharge rate exceeds 5 kw-hrs. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-151 Storage batteries—Insulation. Cells of the nonsealed type shall be supported by suitable insulators such as glass, glazed porcelain, or oil type, or may be grouped and supported on glass or other suitable insulating trays.

Cells of the alkali type in jars of conducting material shall be supported singly, or in groups assembled in nonconducting trays, on porcelain or other suitable insulators.

Cells of the sealed type in containers of insulating material require no additional insulation except as follows: Cells in rubber or composition containers if the total voltage exceeds 150 volts, or cells in glass jars if the total voltage exceeds 250 volts, should preferably be sectionalized into groups not exceeding these voltages, and such groups shall be mounted on trays or racks supported by suitable insulators such as glass, glazed porcelain, or oil type. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-154 Storage batteries—Racks and trays. (1) **Racks.** Racks, as required in this section, refer to frames designed to support cells or trays. They shall be substantial and made of:

(a) Wood, so treated as to be resistant to deteriorating action by the electrolyte; or

(b) Metal, so treated as to be resistant to deteriorating action by electrolyte and provided with insulating members directly supporting the cell; or with suitable insulating material on conducting members; or

(c) Other similar suitable construction.

Design of battery rack shall provide for earthquake shock common to the area.

(2) **Trays.** Trays refer to frames such as crates or shallow boxes usually of wood or other insulating material so constructed or treated as to be resistant to deteriorating action by the electrolyte. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-157 Storage batteries—Floors. It is recommended that the floors of battery rooms in which large batteries comprised of cells in lead-lined wood tanks are installed be of acid-resistive material, or be painted with acid-resistive paint, or otherwise be protected, where acid is likely to drop and accumulate. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-160 Storage batteries—Wiring in battery rooms. Wiring shall be in accordance with the requirements of the National Electrical Code (storage batteries). [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-163 Storage batteries—Guarding live parts in battery rooms. (1) **Guarding.** The arrangement of cells and connections shall be such that any two current-carrying parts between which a voltage exceeding 50 volts exists shall be properly guarded if the parts are otherwise so exposed that persons are liable to make accidental contact with both at the same time.

(2) **Bare conductors.** No bare conductor of more than 150 volts to ground shall be placed in any passageway, unless guarded or isolated by elevation.

(3) **Details of guards.** Required guards shall comply with WAC 296-44-112. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-166 Storage batteries—Illumination for battery rooms enclosing batteries of the nonsealed type. (1) **Type of lamp.** Storage-battery rooms, in addition to daylight which is desirable when available, should be lighted only by incandescent electric lamps in keyless porcelain or composition sockets, controlled from outside the battery room if practicable.

It is recommended that portable lamps be used only in keyless sockets enclosed in holders provided with substantial guards to prevent lamp breakage and be provided with "hard-service" cord.

(2) **Heating appliances.** Heating appliances with open flames or exposed incandescent resistors shall not be installed. [§ 13 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-169 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Current-transformer secondary circuits. (1) **Short-circuiting.** Secondary circuits of current transformers, including constant-current and instrument transformers, shall be provided with means (such as permanent connections for jumpers) for short-circuiting them which can be readily connected while the primary is energized and which are so arranged as to permit the removal of any instrument or other device from such circuits without opening the circuits.

(2) **Protection when of more than 7,500 volts.** Where primaries are of more than 7,500 volts, secondary circuits unless otherwise adequately protected from injury or contact of persons, shall be in permanently grounded conduit. [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-172 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Grounding secondary circuits of instrument transformers. The secondary circuits of all instrument transformers shall be permanently grounded unless the circuits are installed, guarded, and plainly identified as required for the secondary circuits of transformers, in accordance with WAC 296-44-187.

Note: This will sometimes require marking to distinguish such a circuit from others with which it is associated, but which are protected by ground connections. [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-175 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Grounding transformer cases. The metal case or exposed frame of each transformer, reactor, induction regulator, and similar equipment, which is located where dampness or inflammable gas normally exists, or which is connected to a circuit operating at more than 150 volts to ground, shall be permanently grounded.

Exception: Exception is permissible in accordance with WAC 296-44-109(2), in locations free from inflammable gas, where the entire transformer is isolated or guarded as required for the highest-voltage circuit connected with the transformer, and is plainly and conspicuously identified as of that voltage. [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-178 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Location and arrangement of power transformers. If located outdoors, transformers shall be installed in accordance with paragraph (1), (2), or (3) below; if located indoors, or in sidewalk vaults communicating with the interior of the building, they shall be installed in accordance with paragraph (4), (5), or (6) below.

(1) **On poles.** Transformers may be mounted on a pole or on a pole structure, in compliance with WAC 296-44-274 through 296-44-457.

(2) **On walls.** If permitted by local authority, a transformer may be mounted on the exterior wall of a building, in compliance with WAC 296-44-274 through 296-44-457.

(3) **Enclosed.** A transformer may be mounted in an outdoor enclosure such that unauthorized persons cannot readily come in contact with any part of the casing or wiring.

(4) **Indoors, combustible liquid.** A transformer immersed in a liquid that will burn, and located in a station, should be provided with sills to confine any escaping liquid, or with suitable arrangements for draining. If located in a building used for other than station purposes, and the amount of such liquid is considerable, the transformer should be placed in a suitable transformer vault which is ventilated. Such a vault shall be accessible to authorized persons only.

(5) **Indoors, incombustible liquid.** A transformer rated in excess of 25 kva and immersed in a liquid that will not burn shall be furnished with a pressure-relief vent. If installed inside a building used for other than station purposes and not well-ventilated, (1) the transformer shall be furnished with a means for absorbing any gases generated by arcing inside the case, or (2) the pressure-relief vent shall be connected to a chimney or flue which will carry such gases outside the building.

(6) **Indoors, other types.** Other types of transformers, such as air-cooled transformers, or small transformers (25 kva or less) immersed in a liquid that will not burn, may be installed in stations or, if properly enclosed or guarded, in buildings used for other than station purposes. [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-181 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Resistance devices. Rheostats shall be not less than 1 foot from combustible material or separated therefrom by a slab or panel of noncombustible, nonabsorptive material of suitable thickness, not less than one-half inch, somewhat larger than the rheostat, and secured in place by bolts independently of the rheostat supports.

Rheostats or resistance devices shall not be placed where spattering molten metal due to high temperature in the rheostat may fall upon inflammable material or spaces frequently occupied by persons.

Rheostats or resistance devices exposed to excessive dust or flyings should preferably be installed in suitable cabinets or equipped with dustproof side and face plates. (For installation in hazardous locations, see WAC 296-44-118.) [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-184 Transformers, induction regulators, rheostats, ground detectors, and similar equipment—Ground detectors. Every station supply circuits which are not permanently grounded in accordance with WAC 296-44-058 through 296-44-076 shall be provided with one or more reliable means of ground detection which can be applied to determine the existence of a ground on any such circuit extending outside the station. [§ 14 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-187 Conductors—Electrical protection. (1) **Over-current protection required.** Conductors shall be suitable for the location, use, and voltage. Conductors shall be protected against excessive heating by the design of the system or by suitable fuses or automatic circuit-breakers except as provided in WAC 296-44-223.

Automatic circuit-breakers may be set so as to interrupt the circuits only on excessive short-circuits, if constant attendance is provided and protection is thus also afforded by manual operation.

(2) **Fuses in grounded conductors.** Conductors normally grounded for the protection of persons shall be arranged without fuses or automatic circuit-breakers interrupting their continuity between the source of electrical supply and the point at which the ground conductor is attached, unless the circuit-breaker opens all conductors of the circuit with one operation.

(3) **Circuits exposed to higher voltages.** If exposed through transformer windings or outdoor circuits to higher voltages, circuits of less than 750 volts shall be isolated or grounded unless in suitable cable with grounded metal sheath, placed in grounded conduit or other suitable duct, or identified and guarded as required for conductors of the highest voltage to which they are exposed. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-190 Conductors—Precaution against mechanical and thermal damage. (1) **Protection against injury.** Where exposed to mechanical injury suitable casing, armor, or other means shall be employed to prevent injury or disturbance to conductors, their insulation, or supports.

(2) **Flame proofing.** Where conductors with insulating coverings are closely grouped and any one is liable to damage from near-by conductors (as sometimes on the rear of switchboards or in cableways), they shall have a substantial flameproof outer covering.

(3) **Protection against contact.** Large conductors liable to be torn from their supports by the forces to which they are subjected (as by the magnetic fields produced)

shall be so supported they they cannot come in contact with the surfaces along which they are run if uninsulated or with other conductors and equipment.

Note: This applies in particular to generator leads and conductors liable to large short-circuit currents.

(4) **Conductors between generators and outside lines.** Conductors between generators and outside lines shall be accessible and supported on approved noncombustible, nonabsorptive insulators or placed in approved cable, metal conduit, tile, or other fireproof ducts.

(5) **High temperatures.** Insulated conductors exposed to excessive temperatures shall have insulation which remains effective and does not rapidly deteriorate under such conditions. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-193 Conductors—Isolation. All conductors of more than 750 volts to ground, and ungrounded bare conductors of more than 300 volts to ground, shall be isolated by elevation or guarded in accordance with WAC 296-44-112, so that no person can inadvertently come in contact with them; provided that busses and bus structures and line connections thereto may be installed in accordance with WAC 296-44-115, in suitable locations specially arranged for such purposes. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-196 Conductors—Guarding conductors. (1) **Metal-sheathed cable outlets of more than 750 volts between conductors.** The insulation of the several conductors of multiple-conductor cable, where leaving the metal sheath at outlets, shall be thoroughly protected from mechanical injury, moisture, and electrical strains by means of a pothead or equivalent method.

(2) **Form of guards.** Guards shall comply with WAC 296-44-112. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-199 Conductors—Guarding in hazardous locations. (1) **Conduit or metal sheath.** Conductors in locations where inflammable gas normally exists shall be in metal conduit or metal-sheathed cable. All fittings and outlets of such conduit and cable shall be electrically and mechanically continuous with the conduit or metal sheath, and the conduit shall be sealed to prevent entrance of gases.

Note: This rule does not apply to conductors of large cross section which obviously cannot be placed in conduit such as copper bars connecting large cells with end-cell switches.

(2) **Insulating supports.** Conductors in damp locations, if neither in conduit nor in waterproof metal sheaths in other suitable ducts, shall be effectively isolated and supported on a suitable type of insulator. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-202 Conductors—Taping ends and joints. Ends and joints of insulated conductors, unless

otherwise adequately guarded, shall have equal insulating covering with other portions of the conductor. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-205 Conductors—Wiring for illumination. Wiring installed for the illumination of the station should be installed and protected as required for similar utilization equipment and conductors in WAC 296-44-460 through 296-44-664. [§ 15 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-208 Fuses, circuit-breakers, switches, and controllers—Accessible and indicating. (1) **Arrangement.** All switches, fuses, automatic circuit-breakers, starting rheostats, and other control devices shall be readily and safely accessible to authorized persons, unless remotely controlled. They shall be so arranged or marked as to identify the equipment controlled by them, and (except fuses) shall indicate whether they are open or closed.

(2) **Accidental closing.** Switches shall be so installed as to minimize the danger of accidental operation, and where practicable so that gravity cannot close them; such switches as may tend to close by gravity shall be provided with a proper latch or stop block to prevent accidental closing. Where practicable, the blades of knife switches should be dead when the switches are open. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-211 Fuses, circuit-breakers, switches, and controllers—Oil switches. Oil circuit-breakers and oil switches shall, wherever practicable, be isolated from other types of switches and other electric apparatus to conform to WAC 296-44-097(1).

Remote control of switches and circuit-breakers shall be used on circuits of more than 7,500 volts, or when they may be subject to large short-circuit values.

Note: Remote control may be of a mechanical, electrical, or other type. It is not intended to prohibit the use of switches and circuit-breakers operated manually by means of levers or poles from a remote position. (See note in WAC 296-44-097(1), for conditions usually applying to electrical systems.) [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-214 Fuses, circuit-breakers, switches, and controllers—Where switches are required. Suitable disconnectors, switches, or circuit-breakers which may be manually operated shall be inserted in all leads to all supply equipment and all outgoing supply circuits, except as listed below.

Exception 1: Where two or more pieces of electric supply equipment or supply lines are operated as a single unit, no switch is necessarily required between them.

Exception 2: Switches are not required in transformer vaults except as may be deemed necessary by the engineer in charge to meet operating requirements.

Exception 3: Switches are not required in leads to instrument transformers.

Exception 4: Switches are not required in grounded conductors.

Note: In most cases the switch called for should be capable of opening the circuit under loads. In some cases, as between generators and transformer banks used with them, disconnectors only would be required. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-217 Fuses, circuit-breakers, switches, and controllers—Switches or other grounding devices. It is recommended that switches or other suitable means be provided, where practicable, to facilitate short-circuiting and grounding equipment or lines for which the operating rules (see Electrical Workers Safety Rules) require grounding to protect workmen. (See WAC 296-44-109(3).) [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-220 Fuses, circuit-breakers, switches, and controllers—Capacity of switches and disconnectors. (1) **Suitability.** Switches used otherwise than as disconnectors shall be of suitable voltage and ampere rating for the circuit on which they are installed and shall be marked with the current which they can safely interrupt. Disconnectors shall be of suitable voltage and ampere rating for the circuit on which they are installed.

It is recommended that disconnectors be marked with warning against opening when carrying load. Where a group of disconnectors is contained in one room or compartment, a single conspicuous sign may be sufficient.

(2) **Locking.** Remotely controlled switches, oil switches, and disconnectors shall be so arranged that they can be secured in the open position or plainly tagged to prevent careless closing while work is being done on equipment controlled by them.

It is important that the control circuit be tagged or provided with a positive disconnecting means near the apparatus to prevent accidental operation of the mechanism.

For switches and disconnectors the accidental opening of which may cause hazard, similar arrangements are desirable for retaining them in closed position.

Locking is recommended rather than blocking wherever parts of equipment are remote from the point of control.

(3) **Air break.** Unless a switch operating on a circuit between 750 and 7,500 volts makes an air break, it is recommended that there shall be installed between it and the source of energy supply a suitable air- or oil-break disconnector or equivalent device having an air or oil gap suitable for the operating voltage of the circuit. An air-break switch or air-break disconnector shall be inserted in each conductor between electric supply equipment or lines and sources of energy of more than 7,500 volts, if the equipment or lines may have to be worked on without protective grounding while the sources may be alive. (For lightning arresters see WAC 296-44-265.)

(4) **Alinement.** Knife switches shall maintain such alinement under service conditions that they can be

closed with a single unhesitating motion. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-223 Fuses, circuit-breakers, switches, and controllers—Where fuses or automatic circuit-breakers are required. All circuit leads to motors, constant-potential generators, transformer primaries, and station auxiliaries, and all outgoing circuits shall be protected from excessive current by suitable fuses or automatic circuit-breakers, except as indicated below.

Fuses and automatic circuit-breakers may be omitted from the following: (1) A motor-driven generator, rotary converter, or rectifier not used for railway service and not operated in parallel with other machines or batteries if the supply leads to such apparatus are already protected by fuses or automatic circuit-breakers.

(2) Grounded conductors.

(3) Circuits for field excitation.

(4) Leads of alternating-current generators.

(5) Leads connecting two or more pieces of electric supply equipment operated as a single unit.

(6) Circuits supplying interconnected three-wire systems of direct-current distribution.

(7) Leads of series transformers.

(8) Leads of potential transformers or other circuits the opening of which may cause greater hazard to life or property through interruption of service. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-226 Fuses, circuit-breakers, switches, and controllers—Disconnection of fuses before handling. Fuses in circuits of more than 150 volts to ground or more than 60 amperes shall be arranged in one of the following ways: (1) So that the fuses are necessarily disconnected from all sources of electric energy before they can be touched.

(2) So that the fuses can be disconnected from all sources of electric energy by a suitable switch.

(3) So that the fuses can be conveniently handled by means of insulating handles or portable tools provided for the purpose.

Exception: Circuits of less than 150 volts to ground and less than 60 amperes capacity are exempted from the provisions of this rule.

The use of insulating gloves and mats is permissible on circuits not exceeding 750 volts. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-229 Fuses, circuit-breakers, switches, and controllers—Arcing or suddenly moving parts. (1) **Protection from burns.** Fuses and circuit-breakers shall, as far as possible, be so designed, located, or shielded that persons will not be burned by their operation.

(2) **Protection against moving parts.** Handles or levers of circuit-breakers and similar parts which may move suddenly, in such a way that persons in the vicinity are liable to be injured by being struck by them, shall be guarded or isolated. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-232 Fuses, circuit-breakers, switches, and controllers—Grounding noncurrent-carrying metal parts. Exposed noncurrent-carrying metal parts of switch and fuse cases, levers, and other similar parts to which leakage is liable to occur from live parts, and thereby create a hazard, shall be permanently grounded in accordance with WAC 296-44-109.

Exception: Minor parts, such as ferrules of knife switches, which are not liable to become alive, are excepted. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-235 Fuses, circuit-breakers, switches, and controllers—Guarding live parts of switches, fuses, and automatic circuit-breakers. Switches, fuses, and automatic circuit-breakers shall be isolated or guarded in accordance with WAC 296-44-112 and 296-44-115. [§ 16 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-238 Switchboards—Location and accessibility. (1) **General location.** Switchboards shall be so placed that the operator will not be endangered by any live or moving parts of machinery or equipment located near the board.

They shall be so placed as to reduce to a minimum the danger of communicating fire to adjacent combustible material.

(2) **Spaces about boards.** The space back of the board shall be kept clear of rubbish and shall not be used for storage.

(3) **Accessibility.** Switchboards shall be accessible to authorized operators from both sides when the connections are on the back (see WAC 296-44-115 for working space), but may be placed against a wall when operating at not more than 750 volts between conductors with the wiring entirely on the face.

(4) **Arrangements.** Switchboards shall have all switches so arranged that the points of control are readily accessible to the operator. Instruments, relays, and other devices requiring reading or adjustments shall be so placed that work can be readily performed from the working space. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-241 Switchboards—Material and illumination. (1) **Material.** Switchboards shall be made of noncombustible material and be kept free from moisture.

(2) **Illumination.** Sufficient illumination shall be provided both for the front and rear of the switchboard so that the switchboard may be readily operated and instruments conveniently read. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-244 Switchboards—Necessary equipment. Switchboards which control generating equipment or outgoing supply circuits shall (except in substations without regular attendance) be equipped with such instruments as are necessary to show operating conditions. (See WAC 296-44-184 for ground detectors.) [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-247 Switchboards—Arrangement and identification. Connections, wiring, and equipment of switchboards and panelboards shall be arranged in an orderly manner, and all switches, fuses, and circuit-breakers shall be plainly marked, labeled, or arranged, so as to afford ready means for identifying circuits or equipment supplied through them, in accordance with WAC 296-44-124. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-250 Switchboards—Spacings and barriers against short-circuit. (1) **Bare parts.** Switchboards shall have the number of bare parts at different potentials on any panel reduced to a minimum, and these parts shall be effectively separated. Protection or separation of such parts by suitable barriers is recommended where the voltage exceeds 750 between conductors.

Such parts, including bus bars, should be so located, or provided with such insulating coverings or barriers, that parts at different potentials will not be readily short-circuited by tools or other conducting objects.

(2) **Fuses.** Fuses shall be so located as to minimize the danger, in removing or replacing them, of short-circuiting parts at different potentials by the fuses or by the hands of the operator. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-253 Switchboards—Switchboard grounding. (1) **Frames.** Switchboard frames and noncurrent-carrying parts shall be permanently grounded under the conditions and with the exceptions noted in WAC 296-44-109.

Exception 1. Parts of switchboards, such as name plates, screws, and similar small parts which are not liable to become alive, except under very unusual circumstances, are not considered as coming under the rule and may be left ungrounded.

Exception 2. Switchboards electrically connected to other equipment which operate with undergrounded frames may be installed, protected, and identified as equipment of the same voltage. Mats shall be provided in accordance with WAC 296-44-112(3)(f).

(2) **Circuit worked on.** Where protective grounds are occasionally required on circuits for the protection of workmen, a permanent ground connection shall be provided, and also suitable means for effectively and readily connecting the parts being grounded to the ground connection, in accordance with WAC 296-44-109(c). [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-256 Switchboards—Guarding live parts on switchboards. (1) **Guards.** Live parts of switchboards shall be guarded in accordance with WAC 296-44-112.

(2) **Plug-type switchboards.** Plug-type switchboards shall, except while connections are being changed, have no current-carrying part exposed on face of boards; and, if practicable, they and their plug connectors shall be so arranged where the operating voltage exceeds 150 as to

have all current-carrying parts guarded so long as they are alive, even while connections are being changed.

(3) **Exposed parts of more than 7,500 volts.** No switchboard shall have current-carrying parts of more than 7,500 volts exposed (unguarded) unless these parts are effectively isolated by elevation, except at times when occasionally left exposed by removal of covers or entrance into enclosures, such as switch and instrument-transformer cells or compartments, which are ordinarily unoccupied by persons. For such parts, if exposed while alive for any purpose (including busses and disconnectors in compartments), working space shall be provided complying with the requirements under WAC 296-44-115. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-259 Switchboards—Instrument cases. If mounted on switchboards, metal cases of instruments (unless isolated by elevation) operating at more than 750 volts between conductors shall be grounded or enclosed in suitable covers which are either of grounded metal or of insulating material. [§ 17 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-262 Lightning arresters—Location. (1) **Where required.** Suitable precautions should be taken to protect station equipment against excessive lightning which might enter from associated overhead lines.

Exception: Precautions need not be taken in locations where thunderstorms are infrequent at all seasons of the year.

Note: Protection against lightning can be obtained in several ways, such as ground wires, graded insulation, arresters, capacitors, protector tubes, spark gaps, etc.

(2) **Indoors.** Lightning arresters with auxiliaries, if installed inside of buildings shall be located well away from all other equipment, passageways, and combustible parts of buildings. If of a type containing oil, they should be installed in accordance with WAC 296-44-097. [§ 18 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-265 Lightning arresters—Connecting wires. Grounding wires shall be run as directly as possible and be of low impedance and ample current capacity. (See WAC 296-44-058 through 296-44-076 for methods of protective grounding.)

Kinks and coils in the wires between the arresters and the outdoor lines shall be avoided as far as possible. [§ 18 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-268 Lightning arresters—Grounding frames and cases of lightning arresters. All noncurrent-carrying metal parts of arresters shall be grounded, unless effectively isolated by elevation or guarded as required for live parts of the voltage of the circuit to which the arrester is connected, and suitably identified as of that voltage, in accordance with WAC 296-44-109. [§ 18 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-271 Lightning arresters—Guarding live and arcing parts. (1) **Protection from contact or arcing.** All current-carrying parts of arresters on circuits of more than 750 volts, unless effectively isolated by elevation, shall be adequately guarded to protect persons from inadvertent contact with them, or from injury by arcing, in accordance with WAC 296-44-112.

(2) **Making adjustments.** Lightning arresters, unless provided with disconnectors which are always open before work is done on the arresters, shall be so arranged that necessary adjustments are possible (without approach to current-carrying parts) through the use of permanently grounded mechanisms or suitable insulating appliances. Where charging or adjusting must be done with arresters alive, permanently grounded mechanisms or suitable insulating appliances shall always be provided.

(3) **Insulation of attachments.** All choke coils, gap electrodes, or other attachments, inherent to the lightning protective equipment, shall have an insulation from the ground or other conductors equal at least to the insulation demanded at other points of the circuit in the station. [§ 18 (part), filed 3/23/60, effective 12/1/58.]

INSTALLATION AND MAINTENANCE OF ELECTRIC SUPPLY AND COMMUNICATION LINES

WAC 296-44-274 Nature of rules—Minimum requirements. The rules state the minimum requirements for spacing, clearances, and strength of construction. More ample spacing and clearances or greater strength of construction may be provided if other requirements are not neglected in so doing.

Note: Some of these minimum values are exceeded in much existing construction; service requirements frequently call for stronger supports and higher factors of safety than the minimum requirements of these rules. [§ 20 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-277 General requirements applying to overhead and underground lines—Design and construction. All electric supply and communication lines and equipment shall be of suitable design and construction for the service and conditions under which they are to be operated. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-280 General requirements applying to overhead and underground lines—Installation and maintenance. All electric supply and communication lines and equipment shall be installed and maintained so as to reduce hazards to life as far as practicable. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-283 General requirements applying to overhead and underground lines—Accessibility. All parts which must be examined or adjusted during operation shall be arranged so as to be readily accessible to authorized persons by the provision of adequate climbing spaces, working spaces, working facilities, and clearances

between conductors. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-286 General requirements applying to overhead and underground lines—Inspection and tests of lines and equipment. (1) **When in service.**

(a) Initial compliance with rules. Lines and equipment shall comply with these safety rules upon being placed in service.

(b) Inspection. Lines and equipment shall be systematically inspected from time to time by the person responsible for the installation.

(c) Tests. Lines and equipment shall be subjected, when necessary, to tests which will determine their fitness for service.

(d) Record of defects. Any defects revealed by inspection, if not promptly corrected, shall be reported.

(e) Remedying defects. Defective lines and equipment shall be put in good order or effectively disconnected.

(2) When out of service.

(a) Lines infrequently used. Supply lines and equipment infrequently used shall be inspected to see that they are in safe condition for service.

(b) Lines temporarily out of service. Lines temporarily out of service shall be maintained in such condition that a hazard will not be created.

(c) Lines permanently abandoned. Lines permanently abandoned shall be removed or maintained in a safe condition.

Note: Overhead service drops to consumers are often disconnected without removal when the service is discontinued. This is considered good practice when it is undesirable to remove the service drop entirely. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-289 General requirements applying to overhead and underground lines—Isolation and guarding. (1) **Current-carrying parts.** To promote safety to the general public and to employees not authorized to approach conductors and other current-carrying parts of electric supply lines, such parts shall be arranged so as to provide adequate clearance from the ground or other space generally accessible, or shall be provided with guards so as to isolate them effectively from accidental contact by such persons.

(2) **Noncurrent-carrying parts.** Metal fixtures and similar noncurrent-carrying parts, where liable to become charged to more than 300 volts to ground, and frames, cases and hangers of equipment shall be guarded from accidental contact by unauthorized persons or shall be 8 ft. or more above the ground. Grounding is permitted by WAC 296-44-292(2) as an alternative to isolation or guarding. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-292 General requirements applying to overhead and underground lines—Grounding of circuits and equipment. (1) **Methods.** The methods to be used for effective grounding for lightning arresters of supply lines, for circuits, for equipment and for wire raceways are given in WAC 296-44-058 through 296-44-076.

(2) **Parts to be grounded.** Metal lamp posts shall be effectively grounded. Cable sheaths and metal conduits shall be effectively grounded if less than 8 ft. above ground.

Metal fixtures and similar noncurrent-carrying parts, where liable to be charged to more than 300 volts to ground, and frames, cases and hangers of equipment shall be effectively grounded if they are not isolated or guarded as provided by WAC 296-44-289(2).

(3) **Use of ground as part of circuit.** Supply circuits shall not be designed to use the ground normally as the sole conductor for any part of the circuit. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-295 General requirements applying to overhead and underground lines—Arrangement of switches. (1) **Accessibility.** All switches shall be readily accessible to authorized persons.

(2) **Indicating open or closed position.** All switches shall indicate clearly whether they are open or closed.

(3) **Locking.** Pole-top switches accessible to unauthorized persons shall have provision for locking in both open and closed positions, and locks shall be provided.

(4) **Uniform position.** The handles or control mechanism for all switches throughout any system shall have so far as practicable the same position when open and a uniformly different position when closed, in order to minimize operating errors. Where it is advisable to depart from this practice, the switches should be marked so as to minimize the liability to mistakes in operation.

(5) **Fault current protection of operating handles.** Pole-top switches when mounted on other than grounded metal structures shall have their operating handles insulated and isolated from the base of the switch by wood or other adequate insulated sections in operating rod, or the operating handle shall be so arranged that persons operating the handle will be protected by adequately grounded areas that will prevent his body from becoming a path for fault currents traveling to ground due to break-down of switch. [§ 21 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-298 Relations between various classes of lines—Relative levels. (1) **Standardization of levels.** The levels at which different classes of conductors are to be located shall be standardized where practicable for any given community by agreement of the utilities concerned.

Note: This practice facilitates the extension of lines and promotes the safety of the public and workers by permitting the relative levels and required clearances to be readily obtained on jointly or commonly used poles as well as at crossings and conflicts.

(2) **Relative levels—Supply and communication conductors.**

(a) Preferred levels. Where supply and communication conductors cross each other or are in conflict, or are located on the same poles or towers, the supply conductors shall preferably be carried at the higher level.

Exception: This does not apply to trolley feeders which may be located for convenience approximately at the level of the trolley contact conductor.

Note: Supply lines generally use larger conductors than communication lines so there is less liability of contact between the two if the supply conductors are located in the upper position. This relative location also avoids the necessity of workmen on communication conductors passing through supply conductors and working above them and avoids the necessity of increasing the grade of construction required for communication conductors.

(b) Minor extensions. In localities where the practice of placing conductors of communication circuits for public use above supply conductors has been generally established, minor extensions may be made in either system, keeping the conductors in the same relative position. These extensions shall be made only by permission of the recognized administrative authority.

(c) Special construction for supply circuits, the voltage of which is 550 volts or less and carrying power not in excess of 3,200 watts. Where all circuits are owned or operated by one party or where cooperative consideration determines that the circumstances warrant and the necessary coordinating methods are employed, single-phase alternating-current or two-wire direct-current circuits carrying a voltage of 550 volts or less between conductors, with transmitted power not in excess of 3,200 watts, when involved in the joint use of poles with communication circuits, may be installed in accordance with footnote 8(3) of Table 1 in WAC 296-44-316(1) and footnote (1) of Table 11 in WAC 296-44-334(1)(a), under the following conditions:

(i) That such supply circuits are of wire having a good grade of commercial double-braid weatherproof covering not smaller than No. 8 AWG medium hard-drawn copper or its equivalent in strength, and the construction otherwise conform with the requirements for supply circuits of the same class.

(ii) That the supply circuits be placed on the end and adjacent pins of the lowest through signal crossarm and that a 30-inch climbing space be maintained from the ground up to a point at least 24 inches above the supply circuits. The supply circuits shall be rendered conspicuous by the use of insulators of different form or color from others on the pole line or by stenciling the voltage on each side of the crossarm between the pins carrying each supply circuit, or by indicating the voltage by means of metal characters.

(iii) That there shall be a vertical clearance of at least 2 feet between the crossarm carrying these supply circuits and the next crossarm above. The other pins on the crossarm carrying the supply circuits may be occupied by communication circuits used in the operation or control of a signal system or other supply system if owned, operated and maintained by the same company operating the supply circuits.

(iv) That such supply circuits shall be equipped with arresters and fuses installed in the supply end of the circuit and where the signal circuit is alternating current, the protection shall be installed on the secondary side of

the supply transformer. The arresters shall be designed so as to break down at approximately twice the voltage between the wires of the circuit, but the break-down voltage of the arrester need not be less than 1,000 volts. The fuses shall have a rating not in excess of approximately twice the maximum operating current of the circuit, but their rating need not be less than 10 amperes. The fuses likewise shall in all cases have a rating of at least 600 volts, and where the supply transformer is a step-down transformer, shall be capable of opening the circuit successfully in the event the transformer primary voltage is impressed upon them.

(v) Such supply circuits when enclosed in effectively grounded metal-sheathed cable, or other cables carried on effectively grounded messenger, may be carried on a pole below communication attachments, with not less than 2 ft. vertical separation between the supply cable and the lowest communication crossarm. Communication circuits other than those used in connection with the operation of the supply circuits shall not be carried in the same cable with such supply circuits.

(vi) Where such supply conductors are carried below communication conductors, transformers and other apparatus associated therewith shall be attached only to the sides of the crossarm in the space between and at no higher level than, such supply wires.

(vii) Lateral runs of such supply circuits carried in a position below the communication space shall be protected through the climbing space by wood molding or equivalent covering, or shall be carried in multiple-conductor cable having a suitable substantial insulating covering, and such lateral runs shall be placed on the under side of the crossarm.

(3) Relative levels—Supply lines of different voltage classifications (as classified in Table 11).

(a) At crossings or conflicts. Where supply conductors of different voltage classifications cross each other or are in conflict, the higher-voltage lines shall preferably be carried at the higher level.

(b) On poles used only by supply conductors. Where supply conductors of different voltage classifications are on the same poles, relative levels shall be as follows:

(i) Where all circuits are owned by one utility, the conductors of higher voltages shall preferably be placed above those of lower voltage.

Note: These relative levels will often avoid the necessity of increasing the grade of construction for crossarms, pins, and conductor fastenings of the lower-voltage conductors.

(ii) Where different circuits are owned by separate utilities, the circuits of each utility may be grouped together and one group of circuits may be placed above the other group provided that the circuits in each group are located so that those of higher voltage are at the higher levels and the clearances of Table 11 (WAC 296-44-334) are maintained. [§ 22 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-301 Relations between various classes of lines—Avoidance of conflict. Two parallel pole lines, either of which carries supply conductors, shall

where practicable be so separated from each other that neither conflicts with the other. If this is impracticable, then the conflicting line or lines shall be built of the grade of construction required by WAC 296-44-340 through 296-44-349 for a conflicting line or the two lines shall be combined in a single pole line. [§ 22 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-304 Relations between various classes of lines—Joint use of poles by supply and communication circuits. Conditions under which joint use is desirable. In the case of local or distribution circuits along the same highway or similar right of way, where, under the provisions of WAC 296-44-340 through 296-44-349 applying to joint use, grade C construction or less would be required, joint use is generally preferable to separate pole lines (except sometimes in rural districts) unless the number of conductors is very large or the character of the circuits makes joint use undesirable.

Where circuits other than those mentioned above are involved, the choice between joint use of poles and separate pole lines shall be determined through cooperative consideration, by the utilities concerned, of all the factors involved, including the character of circuits, the total number and weight of conductors, tree conditions, number and location of branches and service drops, availability of right of way, etc. Where such joint use is mutually agreed upon, it shall be subject to the appropriate grade of construction as specified in WAC 296-44-340 through 296-44-349. Where such joint use is not employed, separate lines as specified in WAC 296-44-307 shall be used.

In any event, joint use is preferable to separate lines where it would be impracticable to avoid an overbuilt conflict with separate lines. [§ 22 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-307 Relations between various classes of lines—Separate pole lines. Where two separate pole lines are to be used, one of which carries supply conductors and the other communication conductors, they shall be separated, if practicable, so that neither conflicts with the other, but if within conflicting distance, they shall be separated as far as practicable and shall be built of the grade of construction required by WAC 296-44-340 through 296-44-349. [§ 22 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-310 Clearances—General. (1) **Application.** This section covers all clearances, including separations and climbing spaces, involving poles and wires. Clearances of lamps from pole surfaces, from spaces accessible to the general public, and height above ground are covered in WAC 296-44-418(3).

(2) **Constant-current circuits.** The clearances for constant-current circuits shall be determined on the basis of their nominal full-load voltage.

(3) **Metal-sheathed supply cables.** As far as clearances are concerned, effectively grounded continuous metal-sheathed supply cables of all voltages and any supply cables supported on effectively grounded messengers, are

classified the same as open supply wires of 0 to 750 volts between conductors.

(4) **Neutral conductors.** Neutral conductors of supply circuits shall have the same clearances as the phase wires of the circuit with which they are associated, except that neutral conductors which are effectively grounded throughout their length and associated with circuits of over 750 volts between conductors may have the same clearances as circuits of 0 to 750 volts between conductors.

(5) **Maintenance of clearances.** The clearances required by this section shall be maintained at not less than the specified values. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-313 Clearances—Horizontal clearances of supporting structures from other objects. Poles, towers, and other supporting structures and their guys and braces shall have the following horizontal clearances from other objects. The clearance shall be measured between the nearest parts of the objects concerned.

(1) **From fire hydrants.** Not less than 3 feet.

Recommendation: Where conditions permit, a clearance of not less than 4 feet is recommended. [See Appendix, WAC 296-44-88001 through 296-44-88011.]

(2) **From street corners.** Poles and towers should not be set so far from street corners as to make necessary the use of flying taps inaccessible from the poles.

(3) **From curbs.** Not less than 6 inches measured to the street side of the curb. [See Appendix, WAC 296-44-88001 through 296-44-88011.]

(4) **From railroad tracks.** Where railroad tracks are paralleled or crossed by overhead lines, the poles shall, if practicable, be located not less than 12 feet from the nearest track rail. [See Appendix, WAC 296-44-88001 through 296-44-88011.]

Exception 1: At sidings a clearance of not less than 7 feet may be allowed, provided sufficient space for a driveway be left where cars are loaded or unloaded.

Exception 2: Supports for overhead trolley contact conductors may be located as near their own track rail as conditions require. If very close, however, permanent screens on cars will be necessary to protect passengers.

Exception 3: Where necessary to provide safe operating conditions which require an uninterrupted view of signals, signs, etc., along tracks, the parties concerned shall cooperate in locating poles to provide the necessary clearance where practicable. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-316 Clearances—Vertical clearance of wires above ground or rails. The vertical clearance of all wires above ground in generally accessible places or above rails shall be not less than the following: (1) **Basic clearances.** The clearances in Table 1 apply under the following conditions:

(a) Temperatures of 60°F, no wind, with final unloaded sag in the wire, or with initial unloaded sag in cases where wires are maintained approximately at initial unloaded sags.

(b) Span lengths not greater than the following:

Loading district	Span lengths
	Feet
Heavy	175 ¹
Medium	250 ¹
Light	350

¹150 feet in heavy-loading district and 225 feet in medium-loading district for 3-strand conductors, each wire of which is 0.09 inch or less in diameter.

(c) Voltages 0 to 50,000 volts between conductors.

(d) Fixed supports for the conductor or wire. (For other conditions, see subsection (2) of this section.)

TABLE 1.—Minimum vertical clearance of wires above ground or rails

(All voltages are between wires unless otherwise stated. Supply wires include trolley feeders)

Nature of ground or rails underneath wires	Guys; messengers; communication, span, and lightning protection wires; effectively grounded continuous—metal—sheath cable of all voltages			Open supply line wires, arc wires and service drops		Trolley contact conductors and associated span or messenger wires ¹	
	0 to 750 volts	750 to 15,000 volts ⁴	15,000 to 50,000 volts	0 to 750 volts to ground	Exceeding 750 volts to ground		

WHERE WIRES CROSS OVER

	Feet	Feet	Feet	Feet	Feet	Feet
Track rails of railroads (except electrified railroads using overhead trolley conductors) handling freight cars on top of which men are permitted ¹⁶	27 ³	15 ²⁷	27 ³	28 ³	30	22 ⁴ 22 ⁴
Track rails of railroads (except electrified railroads using overhead trolley conductors) not included above ²	18	18	20	22	18 ⁵	20 ⁵
Public streets, alleys or roads in urban or rural districts	18 ⁶	13 ¹⁸	18	20	22	18 ⁵ 20 ⁵
Driveways to residence garages	10	10	20	22	18 ⁵	20 ⁵
Spaces or ways accessible to pedestrians only	13 ⁷	13 ⁸	15	17	16 ⁹	18 ⁹

WHERE WIRES RUN ALONG, AND WITHIN THE LIMITS OF PUBLIC HIGHWAYS OR OTHER PUBLIC RIGHTS-OF-WAY FOR TRAFFIC

Streets or alleys in urban districts	18 ¹⁰	11 ¹³	13 ¹⁸	18 ¹⁰	20	22	18 ⁵	20 ⁵
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[Title 296 WAC—p 690]

Nature of ground or rails underneath wires	Guys; messengers; communication, span, and lightning protection wires; effectively grounded continuous—metal—sheath cable of all voltages			Open supply line wires, arc wires and service drops		Trolley contact conductors and associated span or messenger wires ¹	
	0 to 750 volts	750 to 15,000 volts ⁴	15,000 to 50,000 volts	0 to 750 volts to ground	Exceeding 750 volts to ground		

Roads in rural districts	14 ¹⁰	11 ¹²	15 ¹⁰	18	20	18 ⁵	20 ⁵
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¹Where subways, tunnels or bridges require it, less clearances above ground or rails than required by table 1 may be used locally. The trolley contact conductor should be graded very gradually from the regular construction down to the reduced elevation.

²For wire crossings over railways handling only cars considerably lower than ordinary freight cars, the clearance may be reduced by an amount equal to the difference in height between the highest car handled and the highest ordinary freight car, but the clearance shall not be reduced below that required for street crossings.

³This clearance may be reduced to 25 feet where paralleled by trolley contact conductor on the same street or highway.

⁴In communities where 21 feet has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans (See WAC 296-44-427(4)(b), for conditions which must be met where uniform height above rail is impracticable.)

⁵In communities where 16 feet has been established for trolley contact conductors 0 to 750 volts to ground, or 18 feet for trolley contact conductors exceeding 750 volts, or where local conditions make it impracticable to obtain the clearance given in the table, these reduced clearances may be used if carefully maintained.

⁶If a communication service drop, or a guy which is effectively insulated against the highest voltage to which it is exposed, up to 8,700 volts, crosses a street, alley or road, the clearance may be reduced to 16 feet at the side of the traveled way.

⁷This clearance may be reduced to the following values:

	Feet
(1) For communication conductors of circuits limited to 160 volts to ground, and communication cables	8
(2) For conductors of other communication circuits	10
(3) For guys	8

⁸This clearance may be reduced to the following values:

	Feet
(1) Supply wires (except trolley contact wires) limited to 300 volts to ground	12
(2) Supply wires (except trolley contact wires) limited to 150 volts to ground and located at entrances to buildings	10
(3) Where supply circuits of 550 volts or less, with transmitted power of 3,200 watts or less, are run along fenced (or otherwise guarded) private rights-of-way in accordance with the provisions specified in WAC 296-44-298(2)(c)	10

⁹Trolley contact conductors for industrial railways when not along or crossing over roadways may be placed at a less height if suitably guarded.

¹⁰Where a pole line along a road is located relative to fences, ditches, embankments, etc., so that the ground under the line will never be traveled except by pedestrians, this clearance may be reduced to the following values:

	Feet
(1) Communication conductors limited to 160 volts to ground, and communication cables	8
(2) Conductors of other communication circuits	10

¹¹No clearance from ground is required for anchor guys not crossing streets, driveways, roads, or pathways, nor for anchor guys provided with traffic guards and paralleling sidewalk curbs.

¹²This clearance may be reduced to 13 feet for communication conductors where no part of the line overhangs any part of the highway which is ordinarily traveled, and where it is unlikely that loaded vehicles will be crossing under the line into a field.

¹³Where communication wires or cables cross over or run along alleys, this clearance may be reduced to 15 feet.

¹⁴A conductor which is effectively grounded throughout its length and is associated with a circuit of over 750 volts between conductors may have the clearances specified for open supply wires of 0 to 750 volts.

¹⁵This value may be reduced to 25 feet for guys and for cables carried on messengers.

¹⁶Adjacent to overhead bridges which restrict the practice of permitting men on top of cars, these clearances may be reduced, within the restricted area, by mutual agreement between the parties at interest, but in no case shall the wires or cables be at levels below the under surface of the bridge. [See Figure 1 in Appendix, page 165.]

(2) **Increased clearances.** Greater clearances than specified in Table 1, subsection (1) this section shall be provided where required by paragraphs (a), (b), and (c) below. Increases are cumulative where more than one apply.

Exception: Increased clearances are not required for trolley contact conductors, for guys, or for cable supported by messenger.

(a) Spans longer than specified in subsection (1)(b) of this section. In applying the following rules, the "point of crossing" in the case of roads, streets, alleys and driveways is considered to be the edge of the traveled way farthest from the nearer support of the crossing span. In the case of a railroad crossing, it is the track rail which is farthest from the nearer support of the crossing span. In other situations it is the location under the conductors of any topographical feature which is the determinant of the clearance.

(i) Where point of crossing occurs at point of maximum total sag of the conductor.

(A) General. For spans exceeding the limits specified in subsection (1)(b) of this section, above, the clearance specified in Table 1 shall be increased by 0.1 foot for each 10 feet of the excess of span length over such limits. See (c) below.

(B) Railroad crossings. For spans exceeding the limits specified in subsection (1)(b) of this section, above, the clearance specified in Table 1 shall be increased by the following amounts for each 10 feet by which the crossing span length exceeds such limits. See (c) below.

Loading district	Amount of increase per 10 feet	
	Large conductors	Small ¹ conductors
Heavy and medium	0.15	0.30
Light . . . . .	.10	.15

¹A small conductor is a conductor having an over-all diameter of metallic material equal to or less than the following values:

Material	Outside diameter of conductor	
	Solid	Stranded
	Inches	Inches
All copper	0.160	0.250
Other than all copper . . . . .	.250	.275

(C) Limits. The maximum additional clearance need not exceed the following percentages of the "maximum sag increase" for the conductor concerned:

Loading district	Percentage
Heavy	75
Medium	85
Light	75

The "maximum sag increase" to which these percentages apply is the arithmetic difference between final unloaded sag at 60° F, no wind, and the maximum total sag under the entire conductor loading of WAC 296-44-355 for the loading district concerned, or under 120° F, no wind, whichever sag is the greater, computed for the span length for which such difference is greatest.

(ii) Where point of crossing is not at point of maximum total sag of the conductor. Under these conditions the required clearance may be obtained by multiplying the clearance determined by subsections (1) and (2)(a)(i) of this section by the following factors, but in no case shall the clearance be less than required by Table 1:

Distance from nearer support of crossing span to point of crossing in percentage of crossing span length	Factors
5	0.85
10	.88
15	.91
20	.94
25	.96
30	.98

Distance from nearer support of crossing span to point of crossing in percentage of crossing span length	Factors
35	.99
40 to 50	1.00
Interpolate for intermediate values	

(b) Voltages exceeding 50,000 volts between conductors. For these voltages the clearances given in Table 1 of this section shall be increased at the rate of 0.5 inch for each 1,000 volts of the excess.

(c) Conductors supported by suspension-type insulators at crossings over track rails. The clearances shall be increased by such an amount that the values specified in Table 1 of this section will be maintained in case of a broken conductor in either adjoining span, if the conductor is supported as follows:

(i) At one support by suspension-type insulators in a suspended position, and at the other support by insulators which are not free to swing (including semistrain-type insulators).

(ii) At one support by strain insulators, and at the other support by semistrain-type insulators.

(d) Methods of avoiding this increase of clearance. Any of the following construction methods will avoid the necessity for the increase in clearance required by subsection (2)(c) of this section.

(i) Suspension-type insulators in a suspended position at both supports.

(ii) Semistrain-type insulators at both supports.

(iii) Arrangement of insulators so that they are restrained from displacement toward the crossing.

(3) **Supply pole wiring at underground risers.** Supply wires connecting to underground systems shall not be run open closer to the ground than is indicated by Table 2:

TABLE 2.—Clearance above ground for open supply wiring.

[See Appendix, WAC 296-44-88001 through 296-44-88011.]

Location on pole	Voltage between conductors		
	0 to 750 volts	750 to 15,000 volts	More than 15,000 volts
	Feet	Feet	Feet
Side of pole adjacent to vehicular traffic.....	14	16	18
Side of pole not adjacent to vehicular traffic	8	11	13

[§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-319 Clearances—Wire-crossing clearances. The clearance between any two wires crossing each other and carried on different supports shall not

[Title 296 WAC—p 692]

be less than the following: (1) **Basic clearances.** The clearances given in Table 3 below apply under the following conditions:

(a) Temperature of 60° F, no wind, with the upper conductor or wire at its final unloaded sag and the lower conductor or wire at its initial unloaded sag.

(b) Span lengths not greater than the following for the upper conductor or wire:

Loading district	Span lengths
	Feet
Heavy	175 ¹
Medium	250 ¹
Light	350

¹150 feet in heavy loading district and 225 feet in medium loading district for 3-strand conductors, each wire of which is 0.09 inch or less in diameter.

- (c) Voltages 0 to 50,000 volts between conductors.
- (d) Fixed supports for the upper conductor or wire.

TABLE 3.—Wire-crossing clearances

[See Fig. 2 in Appendix, WAC 296-44-88002.]

(All voltages are between wires except for trolley contact conductors where voltages are to ground)

The insertion of a given clearance in italics indicates that in general the lines operating at the voltage named above this clearance should not cross over the lines at the voltage to the left of the clearance in italics.

Nature of wires crossed over	Open supply wires 0 to 750 volts; supply cables, all voltages, having effectively grounded continuous metal sheaths or messengers; messengers associated with such cables						Guys, span wires, lighting-protection wires
	Open supply wires and service drops ⁶		750 to 8,700 volts		8,700 to 50,000 volts		
	Line wires	Service drops	Feet	Feet			
Communication, including cables and messengers	2 ²	4 ⁹ 3	2 ⁹	4 ⁷	6 ¹⁰	2 ²	
Supply cables, all voltages, having effectively grounded continuous metal sheaths or messengers; messengers associated with such cables	4	2	2	2	4	2	

Nature of wires crossed over	Open supply wires 0 to 750 volts; supply cables, all voltages, having effectively grounded continuous metal sheaths or messengers; messengers associated with such cables		Open supply wires and service drops ⁶		Guys, span wires, lightning-protection wires	
	Communication wires, including cables and messengers	Line wires	Service drops	Open supply wires and service drops ⁶		
				750 to 8,700 volts		8,700 to 50,000 volts
	Feet	Feet	Feet	Feet	Feet	
Open supply wires:						
0 to 750 volts	4	2	2	2	4	
750 to 8,700 volts . .	4	2	4	2	4	
8,700 to 50,000 volts	6	4	6	4	4	
Trolley contact conductors	4 ⁴	4 ⁴ 5	4 ⁴	6	6	
Guys, span wires, lightning-protection wires, service drops 0 to 750 volts	2 ² 8	2	2	4	4	
					2 ¹ 2	

¹Completely insulated sections of guys attached to supporting structures having no conductor of more than 8,700 volts may have less than this clearance from each other.

²The clearance of communication conductors and their guy, span, and messenger wires from each other in locations where no other classes of conductors are involved may be reduced by mutual consent of the parties concerned, subject to the approval of the regulatory body having jurisdiction, except for the fire-alarm wires and wires used in the operation of railroads, or where one set of conductors is for public use and the other used in the operation of supply systems.

³Except where neutral conductors of primary supply circuits are concerned, a clearance of 2 feet may be permitted where the supply conductor is above the communication conductor, provided the crossing is not within 6 feet of any pole concerned in the crossing and the voltage to ground does not exceed 300 volts. (See note 9.)

⁴Trolley-contact conductors of more than 750 volts should have at least 6 feet clearance. This clearance should also be provided over lower-voltage trolley-contact conductors unless the crossover conductors are beyond reach of a trolley pole leaving the trolley-contact conductor or are suitably protected against damage from trolley poles leaving the trolley-contact conductor.

⁵Trolley feeders are exempt from this clearance requirement for trolley-contact conductors if they are of the same nominal voltage and of the same system.

⁶A conductor which is effectively grounded throughout its length and is associated with a circuit of over 750 volts between conductors may have the clearances specified for open supply wires of 0 to 750 volts.

⁷This clearance shall be increased to 6 feet where the supply wires cross over a communication line within 6 feet horizontally of a communication pole.

⁸This clearance shall be increased to 4 feet where communication cables cross over open supply service wires.

⁹Where a 2-foot clearance is required at 60°F, and where conditions are such that the sag in the upper conductor would increase more than 1.5 feet at the crossing point under the applicable loading of rule

251, the 2-foot clearances shall be increased by the amount of sag increase less 1.5 feet.

¹⁰Multigrounded wye circuits not exceeding 8,700 volts to ground may have a 4-foot clearance if the lowest supply wire at the crossing under conditions of 60°F, no wind, and final unloaded sag is not lower than a straight line joining the points of support of the highest communication conductor, provided it is not within 6 feet horizontally of a communication pole.

(2) **Increased clearances.** Greater clearances than given in Table 3, above, shall be provided under the following conditions. The increases in (a), (b) and (c) below are cumulative where more than one are applicable.

(a) Crossing spans longer than specified in subsection (1)(b) of this section. Under these conditions the clearances specified in Table 3 shall be increased as follows:

(i) Where the crossing occurs at the point of maximum total sag in the upper conductor, the clearances of Table 3 shall be increased by the following amounts for each 10 feet by which the crossing span length exceeds the limits specified in subsection (1)(b) of this section:

Loading district	Amount of increase per 10 feet	
	Large conductors	Small ¹ conductors
	Feet	Feet
Heavy and medium	0.15	0.30
Light . . . . .	.10	.15

¹A small conductor is a conductor having an over-all diameter of metallic material equal to or less than the following values:

Material	Outside diameter of conductor	
	Solid	Stranded
	Inches	Inches
All copper	0.160	0.250
Other than all copper . .	.250	.275

The maximum additional clearance need not exceed the following percentages of the "maximum sag increase" for the conductor concerned:

Loading district	Percentage
Heavy	75
Medium	85
Light	75

The "maximum sag increase" to which these percentages apply is the arithmetic difference between final unloaded sag at 60° F, no wind, and the maximum total sag under the entire conductor loading of WAC 296-44-355 for the loading district concerned, or under 120° F, no wind, whichever sag is the greater, computed for the span length for which such difference is greatest.

(ii) If the crossing point is located elsewhere than at the point of maximum total sag in the upper span, the required clearance may be obtained by multiplying the clearance determined in subsection (1) and (2)(a)(i) of

this section by the following factors, but in no case shall the clearance be less than required by Table 3.

Distance from nearer support of crossing span to point of crossing in percentage of crossing span length	Factors for basic clearance of—	
	4 feet	6 feet
5	0.35	0.47
10 .....	.47	.58
15 .....	.60	.68
20 .....	.71	.78
25 .....	.82	.85
30 .....	.90	.92
35 .....	.96	.98
40 to 50	1.00	1.00

Interpolate for intermediate values.

(b) Voltages exceeding 50,000 volts between conductors. For these voltages the clearances given in Table 3 (this section) shall be increased at the rate of 0.5 inch for each 1,000 volts of the excess.

(c) Conductors supported by suspension-type insulators at crossings over communication wires. For such conductors the clearance shall be increased by such an amount that the values specified in Table 3 (this section) will be maintained in case of a broken conductor in either adjacent span, provided such conductor is supported as follows:

(i) At one support by suspension-type insulators in a suspended position, and at the other support by insulators not free to swing (including semistrain-type insulators).

(ii) At one support by a strain insulator, and at the other support by a semistrain-type insulator.

(d) Methods of avoiding this increase of clearance. Any of the following construction methods will avoid the necessity for the increase in clearance required by subsection (2)(c) above:

(i) Suspension-type insulators in a suspended position at both supports.

(ii) Semistrain-type insulators at both supports.

(iii) Arrangement of insulators so that they are restrained from displacement toward the crossing. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-322 Clearances—Clearances of conductors of one line from other conductors and structures. (1) **Clearances from conductor of another line.** The clearance in any direction between any conductor of one line and any conductor of a second and conflicting line shall be not less than the largest value required by (a), (b), or (c) below at 60° F, no wind:

(a) Four feet.

(b) The values required by WAC 296-44-325(1)(b)(i)(A) or (B) for separation between conductors on the same support.

(c) The apparent sag of the conductor having the greater sag, plus 0.2 inch per kilovolt of the highest voltage concerned.

Exception: In situations where supply-line conductors only are involved, the clearance required by (c) above need not be greater than the value required by WAC 296-44-319(1) and (2), for a center-span crossing, assuming the conductor having the larger sag swinging through an arc of 45° from the vertical.

(2) **Clearances from supporting structures of another line.** Conductors of any line passing near a pole or similar supporting structure of a second line, without being attached thereto, shall have clearances from any part of such structure not less than the larger value required by either (a) or (b) below at 60° F, no wind:

(a) Three feet for all voltages over 750 volts.

(b) The values required by WAC 296-44-325(1)(b)(A) and (B) for separation between similar conductors on the same support, increased by 1 inch for each 2 feet of the distance from the supporting structure of the second line to the nearest supporting structure of the first line. The climbing space on the structure of the second line shall in no case be reduced by a conductor of the first line.

(3) **Clearances from buildings.**

(a) General. Conductors shall be arranged and maintained so as to hamper and endanger firemen as little as possible in the performance of their duties.

(b) Ladder space. Where buildings exceed three stories (or 50 feet) in height, overhead lines shall be arranged where practicable so that a clear space or zone at least 6 feet wide will be left, either adjacent to the building or beginning not over 8 feet from the building, to facilitate the raising of ladders where necessary for fire fighting.

Exception: This requirement does not apply where it is the unvarying rule of the local fire departments to exclude the use of ladders in alleys or other restricted places which are generally occupied by supply lines.

(c) Open supply conductors attached to buildings. Where the permanent attachment of open supply conductors of any class to buildings is necessary for an entrance, such conductors shall meet the following requirements:

(i) Conductors of more than 300 volts to ground shall not be carried along or near the surface of the building unless they are guarded or made inaccessible.

(ii) Clearance of wires from building surface shall be not less than those required in Table 9 (WAC 296-44-325(1)(c)(i)) for clearance of conductors from pole surfaces. [See Fig. 1 in Appendix, WAC 296-44-88001.]

(d) Conductors passing by or over buildings.

(i) Minimum clearances. Unguarded or accessible supply conductors carrying voltages in excess of 300 volts between conductors shall not come closer to any building or its attachments (balconies, platforms, etc.) than listed below, except that this rule should not be interpreted as restricting the installation of a trolley contract conductor over the approximate center line of the track it serves.

(A) Spans 0 to 150 feet. For spans of 0 to 150 feet, the clearances shall be as given in Table 4.

TABLE 4.—Clearances of Supply Conductors From Buildings

Voltage of supply conductors	Horizontal clearance	Vertical clearance
	Feet	Feet
300 to 8,700	3	8
8,700 to 15,000	8	8
15,000 to 50,000	10	10
Exceeding 50,000	10 plus 0.4 inch per kv in excess	10 plus 0.4 inch per kv in excess

(B) Spans exceeding 150 feet. Where span lengths exceed 150 feet, the increased clearances required by WAC 296-44-316(2)(a) shall be provided.

Exception: These increased clearances are not required where the voltage of the supply conductors is from 300 to 8,700 volts between conductors.

(ii) Guarding of supply conductors. Supply conductors of 300 volts or more between conductors shall be properly guarded by grounded conduit, barriers, or otherwise, under the following conditions:

(A) Where the clearances set forth in Table 4 (subsection (3)(d)(i)(A)) cannot be obtained.

(B) Where such supply conductors are placed near enough to windows, verandas, fire escapes, or other ordinarily accessible places, to be exposed to contact by persons.

Note: Supply conductors in grounded metal-sheathed cable are considered to be guarded within the meaning of this rule. [See Fig. 1 in Appendix, WAC 296-44-88001.]

(4) Clearances from bridges.

(a) Clearances of conductors from bridges. Supply conductors not installed in grounded conduit or metal-sheath cable, which pass under, over, or near a bridge shall have clearances therefrom not less than given in Table 5.

(b) Guarding trolley-contact conductors located under bridges.

(i) Where guarding is required. Guarding is required where the trolley-contact conductor is located so that a trolley pole leaving the conductor can make simultaneous contact between it and the bridge structure.

TABLE 5.—Clearances From Bridges

[See Fig. 1 in appendix.]

Voltages	Readily accessible portions (other than traveled ways ¹) of any bridge, including wing walls or bridge attachments		From ordinarily inaccessible portions ² of bridges (other than brick, concrete, or masonry) and from abutments	
	For conductors attached to bridge ³	For conductors not attached to bridge	For conductors attached to bridge ^{3 5}	For conductors not attached to bridge ^{4 5}
	Feet	Feet	Feet	Feet
0 to 2500	3.0	3.0	0.5	3.0
Over 2,500 to 5,000	3.0	3.0	1.0	3.0
Over 5,000 to 8,700	3.0	3.0	3.0	3.0
Over 8,700 to 15,000	5.0	5.0	5.0	5.0
Over 15,000 to 25,000	7.5	7.5	7.5	7.5
Over 25,000 to 35,000	7.5	9.0	7.5	9.0
Over 35,000 to 50,000	7.5	12.0	7.5	12.0
Exceeding 50,000	Add 0.4 inch per kv in excess			

Footnotes to Table 5.

¹Where over traveled ways on or near bridges, the clearances of WAC 296-44-316 apply.

²Bridge seats of steel bridges carried on masonry, brick, or concrete abutments which require frequent access for inspection shall be considered as readily accessible portions.

³Conductors should have clearance not less than given in this column, where practicable.

⁴Conductors should have the clearances given in this column increased as much as practicable.

⁵Where conductors passing under bridges are adequately guarded against contact by unauthorized persons and can be deenergized for maintenance of the bridge, clearances of the conductors from the bridge, at any point, may have the clearances specified in Table 9 for clearance from surfaces of crossarms plus one-half the final unloaded sag of the conductor at that point.

(ii) Nature of guarding. Guarding shall consist of a substantial inverted trough of nonconducting material located above the conductor, or of other suitable means of preventing contact between the trolley pole and the bridge structure. [Tables 4 and 5, filed 10/30/64, effective 12/1/64; § 23 (part), Tables 4 and 5, filed 3/23/60, effective 12/1/58.]

WAC 296-44-325 Clearances—Minimum line-conductor clearances and separations at supports. (1) Separation between conductors on pole lines.

(a) Application of rule.

(i) Multiconductor wires or cables. Cables, and duplex, triple or paired conductors supported on insulators or messengers, whether single or grouped, are for the purposes of this rule considered single conductors even though they may contain individual conductors not of the same phase or polarity.

(ii) Conductors supported by messengers or span wires. Clearances between individual wires or cables supported by the same messenger, or between any group and its supporting messenger, or between a trolley feeder, supply conductor, or communication conductor, and their respective supporting span wires, are not subject to the provisions of this rule.

(iii) Measurement of clearances. The clearances and separations stated may be measured from the center of the supporting insulator instead of from the conductor itself.

(b) Horizontal separations between line conductors.

(i) Fixed supports. Line conductors attached to fixed supports shall have horizontal separations from each other not less than the larger value required by either (1) or (2) below for the situation concerned.

Exception 1: The pin spacing at buckarm construction may be reduced as specified in WAC 296-44-328(6), to provide climbing space.

Exception 2: The pin spacing at bridge fixtures may be reduced as specified in subsection (3) of this section.

Exception 3: These clearances do not apply where conductors have insulating covering adequate for the voltage concerned.

(A) Minimum horizontal separation between line conductors of the same or different circuits. Separations shall not be less than given in Table 6.

TABLE 6.—Minimum horizontal separation at supports between line conductors of the same or different circuits.

[See Fig. 6.A - 9.A in Appendix, WAC 296-44-88005.]
(All voltages are between conductors except for railway feeders, which are to ground)

Class of circuit	Separation	Notes
Communication conductors.....	6	Preferable minimum. Does not apply at conductor transportation points. Permitted where pin spacings less than 6 inches have been in regular use. Does not apply at conductor transportation points.
	3	
Railway feeders: 0 to 750 volts, No. 4/0 or larger.....	6	Where 10- to 12-inch separation has already been established by practice, it may be continued, subject to the provisions of subsection (1)(b)(i)(B) of this section for conductors having apparent sags not over 3 feet and for voltages not exceeding 8,700.
0 to 750 volts, smaller than No. 4/0.....	12	
750 volts to 8,700 volts.....	12	
Other supply conductors: 0 to 750 volts.....	10	
750 to 5,000 volts...	12	
5,000 to 33,000 volts.....	22*	
For all conductors of more than 33,000 volts add for each 1,000 volts in excess of 33,000 volts....	0.4	

*On dead ends and buck arms only this distance can be reduced to 18 inches.

(B) Separations according to sags. The separation at the supports of conductors of the same or different circuits of grades B, or C shall in no case be less than the values given by the following formulas, at 60° F, no wind. The requirements of subsection (1)(b)(i)(A) of this section apply if they give a greater separation than this rule.

For line conductors smaller than No. 2 AWG:

$$\text{Separation} = 0.3 \text{ inch per kilovolt} + 7 \sqrt{(S/3)} - 8.$$

For line conductors of No. 2 AWG or larger:

$$\text{Separation} = 0.3 \text{ inch per kilovolt} + 8 \sqrt{S/12}.$$

S is the apparent sag in inches of the conductor having the greater sag, and the separation is in inches.

TABLE 7.—Separation in inches required for line conductors smaller than No. 2 AWG

Voltage between conductors	Sag (in inches)						
	36	48	72	96	120	180	240
2,400	14.5	20.5	28.5	35.0	40.5	51.5	60.0
7,200	16.0	22.0	30.0	36.5	42.0	52.5	61.5
13,200	18.0	24.0	32.0	38.5	43.5	54.5	63.5
23,000	21.0	27.0	35.0	41.5	46.5	57.5	66.5
34,500	24.5	30.5	38.5	44.5	50.5	61.0	70.0
46,000	28.0	34.0	42.0	48.0	53.5	64.5	73.0
69,000	40.5	48.5	55.0	60.5	71.0	80.0	

TABLE 8.—Separation in inches required for line conductors No. 2 AWG or larger

Voltage between conductors	Sag (in inches)						
	36	48	72	96	120	180	240
2,400	14.5	16.5	20.5	23.5	26.0	31.5	36.5
7,200	16.0	18.0	22.0	25.0	27.5	33.0	38.0
13,200	18.0	20.0	23.5	26.5	29.5	35.0	39.5
23,000	21.0	23.0	26.5	29.5	32.0	38.0	42.5
34,500	24.0	26.5	30.0	33.0	35.5	41.5	46.0
46,000	27.5	30.0	33.5	36.5	39.0	45.0	49.5
69,000	36.5	40.5	43.5	46.0	51.5	56.5	

(ii) Suspension insulators not restrained from movement. Where suspension insulators are used and are not restrained from movement, the conductor separation shall be increased so that one string of line insulators may swing transversely through an angle of thirty degrees from a vertical position without reducing the values given in (i) above.

(C) Clearances in any direction from line conductors to supports, and to vertical or lateral conductors, span or guy wires, attached to the same support.

(i) Fixed supports. Clearances shall be not less than given in Table 9.

TABLE 9.—Minimum clearance in any direction from line conductors to supports, and to vertical or lateral conductors, span or guy wires attached to the same support. [See 6.A - 9.A in Appendix, WAC 296-44-88005.]

(All voltages are between conductors)

Clearance of line conductors from—	Communication lines—		Supply lines		
	In general	On jointly used poles	0 to 8,700 volts		Exceeding 8,700 volts add for each 1,000 volts of excess
			In general	On jointly used poles	
	Inches	Inches	Inches	Inches	Inches
Vertical and lateral conductors:					
Of same circuit . .	3	3	3	3	0.25
Of other circuits . .	3	3	6 ⁶	6 ⁶	.4
Span and guy wires attached to same pole:					
General	3 ⁸	6 ^{1 8}	6	6	.4
When parallel to line	3 ⁸	6 ^{1 8}	12 ¹	12 ¹	.4
Lightning-protection wires parallel to line	2 5	2 5	2 5	2 5	.4
Surfaces of cross-arms	3 ³	3 ³	3	3	.25
Surfaces of poles . . .	3 ³	5 ³	3 ⁷	5 ^{4 7}	.25

¹For guy wires, if practicable. For clearances between span wires and communication conductors, WAC 296-44-334(5)(c).

²Clearance shall not be less than the separation required by Table 6 or subsection (1)(b)(i)(B) of this section between two line conductors of the voltage concerned.

³Communication conductors may be attached to supports on the sides or bottoms of crossarms or surfaces of poles with less clearance, if at least 40 inches from any supply line conductor of less than 8,700 volts and at least 60 inches from any supply line conductor of more than 8,700 volts carried on the same pole.

⁴This clearance applies only to supply conductors carried on cross-arms below communication conductors, on joint poles. Where supply conductors are above communication conductors the clearance shall be at least 3 inches.

⁵For the purpose of applying the above table, the voltage of lightning-protection wires shall be considered as being the voltage to ground of the associated supply conductors.

⁶For supply circuits of 0 to 750 volts, this clearance may be reduced to 3 inches.

⁷A neutral conductor which is effectively grounded throughout its length and is associated with supply circuits may be attached directly to the pole surface.

⁸Guys and messengers may be attached to the same strain plates or to the same through-bolts.

(ii) Suspension insulators not restrained from movement. Where suspension insulators are used and are not restrained from movement, the conductor clearances from surfaces of supports, from span or guy wires, or from vertical or lateral conductors shall be such that the

values of clearances required by (i) above will be maintained with an insulator swing of thirty degrees from the vertical position.

(d) Conductor separation—Vertical racks. [See Appendix at end of this chapter.] Conductors or cables may be carried on vertical racks or separate brackets other than wood placed vertically at one side of the pole and securely attached thereto, if all the following conditions are met:

(i) The voltage between conductors shall be not more than 750 volts, except that cables having effectively grounded continuous metal sheath may carry any voltage.

(ii) Conductors shall be of the same material or materials.

(iii) Vertical spacing between conductors of 0 to 300 volts shall be not less than 8 inches, except for busses and service takeoffs, where the spacing may be reduced to 4 inches. (See Table 9, subsection (1)(c) of this section for necessary clearances from pole surfaces.) [See Appendix at end of this chapter.]

(iv) Vertical spacing between conductors of 300 to 750 volts shall be not less than 12 inches, except for busses and service takeoffs, where spacing may be reduced to 8 inches. [See Appendix at end of this chapter.]

Exception: The above conditions shall not permit supply circuits of 0 to 750 volts to occupy the same arm with circuits of over 750 volts except on substation structures and transformer banks.

(e) Separation between supply circuits of different voltage classifications on the same crossarm. Supply circuits of any one voltage classification as given in Table 11 (WAC 296-44-334(1)(a)) may be maintained on the same crossarm with supply circuits of the next consecutive voltage classification only under the following conditions:

(i) If they occupy pin positions on opposite sides of the pole.

(ii) If in bridge-arm or side-arm construction they are separated by a distance of not less than the climbing space required for the higher voltage concerned and provided for in WAC 296-44-328.

(iii) If series lighting or similar supply circuits are ordinarily dead during periods of work on or above the crossarm concerned.

(iv) If the two circuits concerned are communication circuits used in the operation of supply lines, and supply circuits of less than 8,700 volts, and are owned by the same utility, provided they are installed as in (i) or (ii) above.

Exception: The above conditions shall not permit supply circuit of 0 to 750 volts to occupy the same arm with circuits of over 750 volts except on substation structures and transformer banks.

(2) Separation between conductors attached to buildings. Separation of wires from each other shall be not less than those required in Table 6 (subsection (1)(b)(i)(A)) for separation of conductors from each other as supports.

Exception: Conductors on vertical racks or separate brackets other than wood placed vertically meeting the requirements of subsection (1)(d) of this section may have the separations specified in that rule.

(3) **Separation between conductors attached to bridges.** Supply conductors attached to bridges and supported at frequent intervals may have less separation at supports than required by subsection (1)(b)(i)(A) and (B). The separation shall be not less than the clearance between supply conductors and the surfaces of poles or crossarms required by subsection (1)(c)(i), or less than the following:

Span length:	Separation inches
0 to 20 feet.....	6
20 to 50 feet.....	9

[Subsections (1)(b)(ii) and (1)(c)(ii), filed 10/30/64, effective 12/1/64; § 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-328 Clearances—Climbing space.

(1) **Location and dimensions.** (a) A climbing space having the horizontal dimensions specified in subsection (5) of this section shall be provided past any conductors, crossarms, or other parts.

(b) The climbing space shall be provided on all poles and structures.

(c) The climbing space shall extend vertically past any conductor or other part between levels above and below the conductor as specified in subsections (5), (6), (7), and (8) of this section. The position of the climbing space shall be maintained for at least 40 inches above and below any limiting conductor level and where the limiting conductor levels are separated 6 feet or more, the climbing space may be rotated by not more than 1/4 of the distance around the pole between any such levels. Where the climbing space is on the face or back of the pole, this space may be considered as in either quadrant to the right or left for the purpose of interpreting this rule. [See Appendix at end of this chapter.]

(d) The climbing space shall include not less than one quadrant nor more than one-half of the pole cross-section.

(2) **Portions of supporting structures in climbing space.** Portions of the pole or structure when included in one side or corner of the climbing space, are not considered to obstruct the climbing space, providing that such inclusion into the climbing space does not exceed 25% of the total area of the specified climbing space. Where such a condition exists, additional space shall be added to the original spacing to compensate for the loss of clearances.

(3) **Crossarm location relative to climbing space.** All single crossarms should be located on the same face and side of the pole to avoid unnecessarily obstructing the climbing space through the different conductor levels. One arm of sets of double crossarms protruding into the climbing space shall not be considered as an obstruction in the climbing space. [See Appendix at end of this chapter.]

(4) **Location of supply and communication apparatus relative to climbing space.** Transformers, regulators,

lightning arresters, fuse mountings, switches, service brackets, communication terminal cans, and service drop hooks and other attachments shall be mounted outside the climbing space. Pole steps shall be placed so that they do not interfere with the climbing space. [See Appendix at end of this chapter.]

(5) **Climbing space through conductors on crossarms.** [See Appendix at end of this chapter.]

(a) Conductors of same voltage classification on same crossarm. Climbing space between conductors shall be of the horizontal dimensions specified in Table 10 below, and shall be provided both along and across the line, and shall be projected vertically not less than 40 inches above and below the limiting conductors. Where communication conductors are above supply conductors of more than 8,700 volts, the climbing space shall be projected vertically at least 60 inches above the highest supply conductor. [See Appendix at end of this chapter.]

Exception 1: This rule does not apply if it is the unvarying practice of the employer concerned to prohibit employees from ascending beyond the conductors of the given line, unless the line is killed.

(b) Conductors of different voltage classifications on same crossarm. The climbing space shall be that required by Table 10 below for the highest voltage of any conductor bounding the climbing space. The climbing space shall extend vertically to the limits specified in paragraph (a) above, and the exception thereto.

(c) Horizontal climbing-space dimensions.

TABLE 10.—Minimum horizontal dimensions of climbing space

Character of conductors adjacent to climbing space	Voltage of conductors					Horizontal dimensions of climbing space (inches)	
	To ground		Between wires		Communication conductors	On poles used solely by—	
	Supply conductors		Supply conductors			On jointly used poles	Supply conductors above communication conductors
Communication conductors...	0 to 150	.....	No re-quire-ment.	.....	2	No re-quire-ment.	.....
	Exceed- ing 150.	.....	24 recom- mended.	.....	2	24 recom- mended.	.....
Supply conductors.	Less than 300.	.....	24	.....	24	.....	30.
	300 to	8,700	.....	30	.....	30	.....
	.....	8,700 to 15,000	.....	36	.....	36	.....
	.....	Exceed- ing 15,000	.....	More than 36. ³	.....	More than 36. ³	More than 36. ³

¹This relation of levels is not, in general, desirable and should be avoided where practicable.

²Climbing space shall be the same as required for the supply conductors immediately above, with a maximum of 30 inches, except that a climbing space of 16 inches across the line may be employed for communication cables or conductors where the only supply conductors at a higher level are secondaries (0 to 750 volts between conductors) supplying airport or airway marker lights or crossing over the communication line and attached to the pole top or to a pole-top extension fixture. [See Appendix, WAC 296-44-88001 through 296-44-88011.]

(6) **Climbing space on buckarm construction.** The full width of climbing space shall be maintained on buckarm construction and shall extend vertically in the same position at least 40 inches (or 60 inches where required by subsection (5)(a)) above and below any limiting conductor.

Method of providing climbing space on buckarm construction. With circuits of less than 5,000 volts and span lengths not exceeding 150 feet and sags not exceeding 15 inches for wires of No. 2 and larger sizes, or 30 inches for wires smaller than No. 2, a six-pin crossarm having pin spacing of 14 1/2 inches may be used to provide a 30-inch climbing space on one corner of a junction pole by omitting the pole pins on all arms, and inserting pins midway between the remaining pins so as to give a spacing of 7 1/4 inches, provided that each conductor on the end of every arm is tied to the same side of its insulator, and that the spacing on the next pole is not less than 14 1/2 inches. [See Appendix at end of this chapter.]

(7) **Climbing space past vertical conductors.** One vertical run or riser incased in suitable conduit or other protective covering not over 2 inches outside diameter and securely attached to the surface of the pole or structure and/or a ground wire attached to the surface of the pole, are allowed in the climbing space. It is recommended that this practice be avoided whenever practical.

(8) **Climbing space near ridge-pin conductors.** The climbing space specified in subsection (5)(c) shall be provided above the top crossarm to the ridge-pin conductor but need not be carried past it. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-331 Clearances—Working space.

(1) **Location of working spaces.** Working spaces shall be provided on the climbing face of the pole at each side of the climbing space.

(2) **Dimensions of working spaces.**

(a) Along the crossarm. The working space shall extend from the climbing space to the outmost pin position on the crossarm.

(b) Perpendicular to the crossarm. The working space shall have the same dimension as the climbing space (See WAC 296-44-328(5)). This dimension shall be measured from the face of the crossarm.

(c) Vertically. The working space shall have a height not less than that required by WAC 296-44-334 for the vertical separation of line conductors carried at different levels on the same support.

(3) **Location of vertical and lateral conductors relative to working spaces.** The working spaces shall not be obstructed by vertical or lateral conductors. Such conductors shall be located on the opposite side of the pole from the climbing side or on the climbing side of the pole at a distance from the crossarms at least as great as the width of climbing space required for the highest-voltage conductors concerned. Vertical conductors enclosed in suitable conduit may be attached on the climbing side of the pole, in compliance with WAC 296-44-328(7).

(4) **Location of buckarms relative to working spaces.** Buckarms may be used under any of the following conditions, provided the climbing space is maintained. Climbing space may be obtained as in WAC 296-44-328(6). [See Appendix at end of this chapter.]

(a) Standard height of working space. Lateral working space of the height required by Table 11 (WAC 296-44-334(1)(a)) may be provided between the buckarms and adjacent line arms to which conductors on the buckarms are not attached.

Method of meeting requirements. This may be accomplished by increasing the spacing between the line crossarm gains.

(b) Reduced height of working space. Buckarms may be inserted at reduced spacing when the conductors on the buckarms are attached to conductors on one adjacent linearm as follows: Where wires are of 0 to 750 volts spacing may be reduced to 12 inches; where wires are of 750 to 15,000 volts spacing may be reduced to 18 inches. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-334 Clearances—Vertical separation between line conductors, cables, and equipment located at different levels on the same pole or structure. All line conductors, cables, or equipment located at different levels on the same pole or structure shall have the vertical separations set forth below. (1) **Vertical separation between horizontal crossarms.** Crossarms supporting line conductors shall be spaced in accordance with Table 11. Vertical separations between crossarms shall be measured from center to center.

(a) Basic separations. The separations given in the following Table 11 are for crossarms carrying conductors of 0 to 50,000 volts between conductors attached to fixed supports. [See Appendix at end of this chapter.]

(b) Increased separations for voltages exceeding 50,000 volts between conductors. For voltages greater than 50,000 volts between conductors the clearances of Table 11 shall be increased at the rate of 0.4 inch per 1,000 volts of the excess. [See Appendix at end of this chapter.]

TABLE 11.—Vertical separation of crossarms carrying conductors

(All voltages are between conductors) [See Appendix, WAC 296-44-88001 through 296-44-88011.]

Conductors usually at lower levels	Supply conductors; preferably at higher levels				
	Open wires, 0 to 750 volts; cables, all voltages, having effectively grounded continuous metal sheath or messenger	750 to 8,700 volts	8,700 to 15,000 volts	15,000 to 50,000 volts	
	Feet	Feet	Feet	Same utility	Different utilities
Communication conductors:					
General	4 ^{1 2}	4	7	—	7
Used in operation of supply lines	2	3	4	7	7
Supply conductors:					
0 to 750 volts	2	3 ³	7 ^{5 6}	7 ⁵	7
750 volts to 5,000 volts	—	2 ³	7 ⁶	7	7
5,000 volts to 8,700 volts	—	2 ³	4	4	7
8,700 volts to 15,000 volts:					
If worked on alive with long-handled tools, and adjacent circuits are neither killed nor covered with shields or protectors	—	—	4	4	6
If not worked on alive except when adjacent circuits (either above or below) are killed or covered by shields or protectors, or by the use of long-handled tools not requiring linemen to go between live wires	—	—	2	4 ⁴	4 ⁴
Exceeding 15,000 volts, but not exceeding 50,000 volts	—	—	—	4 ⁴	4 ⁴

¹Where supply circuits of 550 volts or less, with transmitted power of 3,200 watts or less, are run below communication circuits in accordance with WAC 296-44-298(2)(c), the clearance may be reduced to 2 feet.

²In localities where the practice has been established of placing on jointly used poles, crossarms carrying supply circuits of less than 300 volts to ground and crossarms carrying communication circuits at a vertical separation less than specified in the table, such existing construction may be continued until the said poles are replaced provided that—

The minimum separation between existing crossarms is not less than 2 feet, and that—

Extensions to the existing construction shall conform to the clearance requirements specified in Table 11.

When communication conductors are all in cable, a supply crossarm carrying only wires of not more than 300 volts to ground may be placed at not less than 2 feet above the point of attachment of the cable to the pole provided that—

The nearest supply wire on such crossarm shall be at least 30 inches horizontally from the center of the pole, and that—
The cable be placed so as not otherwise to obstruct the climbing space.

³Where conductors are operated by different utilities, a minimum vertical spacing of 4 feet is required.

⁴These values do not apply to adjacent crossarms carrying phases of the same circuit or circuits.

⁵This value may be reduced to 4 feet where secondary vertical-rack construction is used on one side or face of pole, or on two sides where conductors are deadened, only. Service contacts are permitted in addition.

⁶A primary buck arm not less than 8 feet long supporting not more than 2 conductors in the end pin positions or one lateral primary conductor dead-ended on the pole, may be placed in the 7 foot spacing provided that this spacing is not reduced to less than 5 feet.

(2) **Vertical separation between line conductors on horizontal crossarms.** [See Appendix at end of this chapter.] Where line conductors are supported on horizontal crossarms spaced as required in subsection (1); the vertical separation between such conductors shall be not less than the following:

(a) Where conductors on the crossarm are of the same voltage classification. Under these conditions, the vertical separation required by Table 11 may be reduced as follows:

Where crossarm separation required by table 11 is—	Separation between conductors may be reduced to—
2 feet	16 inches
3 feet	28 inches
4 feet	40 inches
6 feet	60 inches
7 feet	70 inches

(b) Where conductors of different voltage classifications are on same crossarm. Under these conditions, the vertical separation between conductors on adjacent crossarms shall be that required by Table 11 (subsection (1)(a)) above for the highest voltage classification concerned.

(c) Conductors of different sags on same support.

(i) Variation in clearance. Line conductors supported at different levels on the same structure and strung to supporting structures so adjusted that the minimum spacing at any point in the span, at 60° F, no wind, shall not be reduced more than 25 percent from that required at the supports by WAC 296-44-325(1)(b)(i)(A) and (B) and this section.

(ii) Readjustment of sags. Sags should be readjusted when necessary to accomplish the foregoing, but not reduced sufficiently to conflict with the requirements of WAC 296-44-364(6)(d). In cases where conductors of different sizes are strung to the same sag for the sake of appearance or to maintain unreduced clearance throughout storms, the chosen sag should be such as will keep the smallest conductor involved in compliance with the sag requirements of WAC 296-44-364(6)(d).

(3) **Separation in any direction.** The separation in any direction between conductors of the same or different

voltage classification when carried on the same structure, but on crossarms which are not horizontal, shall be not less than the values given in Table 11 (this section) for vertical separation. The separation in any direction shall not in any case be less than the horizontal separation specified in WAC 296-44-325(1)(b)(i)(A) and (B).

(4) **Vertical separation for line conductors not carried on crossarms.** The vertical separation between conductors not carried on crossarms shall be the same as required in subsection (2)(a) of this section, for conductors on crossarms.

Exception: Conductors on vertical racks or separate brackets other than wood placed vertically meeting the requirements of WAC 296-44-325(1)(d) may have separations as specified in that rule.

(5) **Vertical separation between conductors and non-current-carrying metal parts of equipment.**

(a) **Equipment.** For the purpose of measuring separations under this rule, "equipment" shall be taken to mean noncurrent-carrying metal parts of equipment, including metal supports for cables or conductors, and metal supply-crossarm braces which are attached to metal crossarms or are less than 1 inch from transformer cases or hangers which are not effectively grounded.

(b) **Separations in general.** Vertical separations between supply conductors and communication equipment, between communication conductors and supply equipment, and between supply and communication equipment shall be as follows, except as provided in (c), below:

Supply voltage between conductors	Vertical separation
	Inches
0 to 8,700	40
Exceeding 8,700	60 ¹

¹Transformer cases and associated hangers and supply cables, when effectively grounded, may have a separation of 40 inches.

(c) **Separations for span wires and brackets.** Span wires or brackets for lamps or trolley contact conductors shall have at least the vertical separations from communication equipment set forth below:

- From open communication conductors on crossarms:
 - Span wire or brackets above crossarm . 20 inches¹
 - Span wire or bracket below crossarm . . 2 feet
- From messenger wires carrying communication cables 1 foot
- From terminal box of communication cables, if practicable 1 foot²
- From communication brackets, bridle wire rings, or drive hooks 2 inches

¹This may be reduced to 12 inches for either span wires or metal parts of lamp brackets at points 40 inches or more from the pole surface.

²Where it is not practicable to obtain a clearance of 1 foot from terminal boxes of communication cables, all metal parts of terminals shall have the greatest practicable separation from fixtures or span

wires, including all supporting screws and bolts of both attachments. [See Figure 6.A-9.A in Appendix, WAC 296-44-88005.]

Exception: If lamp brackets are effectively grounded, these separations do not apply.

[§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-337 Clearances—Clearances of vertical and lateral conductors from other wires and surfaces on the same support. Vertical and lateral conductors shall have the clearances and separations required by this rule from other conductors, wires, or surfaces on the same support.

Exception 1: This rule does not prohibit the placing of supply circuits of the same or next voltage classification in the same iron pipe, if each circuit or set of wires be inclosed in a metal sheath.

Exception 2: This rule does not prohibit the placing of paired communication conductors in rings attached directly to the pole or to messenger.

Exception 3: This rule does not prohibit placing grounding conductors, neutral conductors which are effectively grounded throughout their length and associated with supply circuits, metal sheathed supply cables or conductors enclosed in conduit, directly on the pole.

Exception 4: This rule does not prohibit placing supply circuits of 550 volts or less and not exceeding 3,200 watts and properly insulated, in the same cable with control circuits with which they are associated.

(1) **Location of vertical or lateral conductors relative to climbing spaces, working spaces, and pole steps.** Vertical or lateral conductors shall be located so that they do not obstruct climbing spaces, or lateral working spaces between line conductors at different levels, or interfere with the safe use of existing pole steps.

Exception: This rule does not apply to vertical runs incased in suitable conduit or other protective covering. (See WAC 296-44-328(7)).

(2) **Conductors not in conduit.** Conductors not incased in conduit shall have the same clearances from conduits as from other surfaces of structures.

(3) **Mechanical protection near ground.** Where within 8 feet of ground, all vertical conductors, cables, and grounding wires shall be protected by a covering which gives suitable mechanical protection. For grounding wires from lightning arresters, the protective covering specified above shall be of wood molding, or other insulating material giving equivalent protection.

Exception 1: This covering may be omitted from armored cables or cables installed in a grounded metal conduit.

Exception 2: This covering may be omitted from vertical runs of communication cables or conductors.

Exception 3: This covering may be omitted from grounding wires in rural districts having triplebraided weather-proof covering, or where such grounding wire is one of a number of grounding wires used to provide multiple grounds.

Exception 4: This covering may be omitted from wires which are used solely to protect poles from lightning.

(4) Requirements for vertical and lateral supply conductors on supply line poles or within supply space on jointly used poles.

(a) General clearances. In general, clearances shall be not less than the values specified in Table 12.

TABLE 12.—General clearances.

(All voltages are between conductors)

Clearance of vertical and lateral conductors	Clearance for highest voltage concerned in the clearance	
	0 to 8,700 volts	Exceeding 8,700 volts, add the following for each 1,000 in excess
	Inches	Inches
From surfaces of supports	3	0.25
From span, guy, or messenger wires . . .	6	.4
From line conductors rigidly supported on fixed supports, such conductors being of—		
Same circuit	3	.25
Different circuits	6	.4
From line conductors not rigidly supported on fixed supports ¹		1

¹The clearances shall be increased beyond the values given above from line conductors on fixed supports (See WAC 296-44-325(1)(b)(ii), and (1)(c)(ii)).

(b) Special cases. The following requirements apply only to portions of a pole which workmen ascend while the conductors in question are alive:

(i) Side-arm construction. Vertical conductors in metal-sheathed cables and grounding wires may be run without insulating protection from supply line conductors on poles used only for supply lines and employing side-arm construction on the side of the pole opposite to the line conductors if climbing space is provided on the line-conductor side of the pole.

(ii) On insulators. Vertical and lateral conductors of less than 8,700 volts between conductors if on poles used only for supply lines may be run in multiple-conductor cables having suitable substantial insulating covering, if such cable is held taut on standard insulators supported on pins or brackets and is arranged so that the cable is held at a distance of approximately 5 inches from the surface of the pole and from any pole step.

(iii) Conductors to street lamps. On poles used only for supply lines, open wires may be run from the supply line arm directly to the head of a street lamp, provided the clearances of Table 12 are obtained and the open wires are substantially supported at both ends.

(iv) Conductors of less than 300 volts. Vertical or lateral secondary supply conductors of not more than 300 volts to ground may be run in multiple-conductor cable attached directly to the pole surface or to cross-arms in

such a manner as to avoid abrasion at the point of attachment. Each conductor of such cable which is not effectively grounded, or the entire cable assembly, shall have an insulating covering required for a conductor of at least 1,000 volts.

(v) Other conditions. If open wire conductors are within 4 feet of the pole, vertical conductors where within a zone of 4 feet above and below such line conductors of not more than 8,700 volts between conductors, or where within a zone of 6 feet above and below such line conductors of more than 8,700 volts between conductors, shall be run in one of the following ways:

(A) So as to clear the pole center by not less than 15 inches if the vertical conductors are of 8,700 volts less between conductors, or 20 inches if more than 8,700 volts;

(B) Enclosed in insulating conduit, or in metal conduit or cable protected by an insulating covering;

(C) Conductors with triple-braid weather-proof or equivalent covering and covered by wood molding.

Methods (B) and (C) apply also to lateral runs and to grounding conductors, except that conductors for grounding lightning-protection wires are not required to be covered within 6 feet above or below circuits of 15,000 volts or more.

(5) Requirements for vertical and lateral communication conductors on communication line poles or within the communication space on jointly used poles.

(a) Clearances from wires. The clearances and separations of vertical and lateral conductors from other conductors (except those in the same ring run) and from guy, span, or messenger wires shall be 3 inches.

(b) Clearances from pole and crossarm surfaces. Vertical and lateral insulated communication conductors may be attached direct to a pole or crossarm. They shall have a vertical clearance of at least 40 inches from any supply conductors (other than vertical runs or lamp leads) of 8,700 volts or less between conductors, or 70 inches if more than 8,700 volts between conductors.

Exception: These clearances do not apply where the supply circuits involved are those carried in the manner specified in WAC 296-44-298(2)(C).

(6) Requirements for vertical supply conductors passing through communication space on jointly used poles. Vertical supply conductors, including grounding wires, which pass through communication line space on jointly used poles shall be installed as follows:

(a) Metal-sheathed supply cables. Metal-sheathed supply cables shall be covered as follows:

(i) Extent of covering. covering shall extend from the lowest points of such cables up to 40 inches or more above the highest communication conductors.

(ii) Nature of covering. The covering shall consist of wood molding or other suitable insulating material at points higher than 8 feet above the ground.

Exception 1: Metal pipe may be used throughout, under the following conditions:

On poles where there are no trolley attachments and the metal pipe is effectively grounded, no insulating covering is required.

On poles where there are trolley attachments or where the metal pipe is not effectively grounded, the pipe shall be covered with wood molding or other suitable insulating material from a point six feet below the lowest communication wire or trolley attachment to a point 40 inches above the highest communication wire or trolley attachment.

Exception 2: No insulating covering is required over supply secondary multi-conductor cables attached directly to the pole surface in accordance with the requirements of subsection (6)(b)(iii).

Exception 3: Where there are no trolley attachments on the pole, no insulating covering is required over supply cables having effectively grounded lead sheath, or supply cables, having effectively grounded metal sheath of other types where mutually agreed to by the parties concerned.

(b) Supply conductors. Supply conductors shall be installed in one of the following ways:

(i) In conduit. Conductors of all voltages may be enclosed in the same way and to the same extent as required in 1 above for metal-sheathed cables.

(ii) On pins and insulators. Vertical and lateral conductors of street-lighting circuits and service leads of less than 750 volts to ground may be run on the street side of the pole in multiple-conductor cable having suitable substantial insulating covering if such cable is held taut on standard insulators supported on pins or brackets and arranged so that the cable shall be held at a distance of approximately 5 inches away from the surface of the pole or from any pole steps.

(iii) Installed on the pole surface. Secondary supply conductors of not more than 300 volts to ground may be run in multiple-conductor cables attached directly to the pole surface in such a manner as to avoid abrasion at the points of attachment. In the case of aerial services, the point where such cables leave the pole shall be at least 40 inches above the highest, or 40 inches below the lowest, communication attachment. Each conductor of such cable which is not effectively grounded shall be insulated for a potential of at least 1,000 volts.

(iv) Suspended from supply crossarm. Lamp leads of street lighting circuits may be run from supply crossarms directly to a street lamp bracket or luminaire under the following conditions:

(A) The vertical run shall consist of paired wires or multiple-conductor cable securely attached at both ends to suitable brackets and insulators.

(B) The vertical run shall be held taut at least 40 inches from the surface of the pole (through the communication space), at least 12 inches beyond the end of any communication crossarm by which it passes, and at least 6 inches from communication drop wires.

(C) Insulators attached to lamp brackets for supporting the vertical run shall be capable of meeting, in the position in which they are installed, the same flashover requirements as the luminaire insulators.

(D) Each conductor of the vertical run shall be No. 10 AWG or larger.

(c) Supply grounding wires. Supply grounding wires shall be covered with wood molding or other suitable insulating covering to the extent required for metal-sheathed cables in subsection (6)(a) above.

Exception: If there are no trolley attachments on the pole, insulating covering is not required for a grounding conductor which is metallically connected to a conductor which forms part of an effective grounding system.

(d) Separation from through bolts. Vertical runs of supply conductors shall be separated from the ends of through bolts associated with communication line equipment by one-eighth of the circumference of the pole where practicable, but in no case less than 2 inches.

(7) **Requirements for vertical communication conductors passing through supply space on jointly used poles.** All vertical runs of communication conductors passing through supply space shall be installed as follows:

(a) Metal-sheathed communication cables. Vertical runs of metal-sheath communication cables shall be covered with wood molding, or other suitable insulating material, where they pass trolley feeders or other supply-line conductors. This insulating covering shall extend from a point 40 inches above the highest trolley feeders, or other supply conductors, to a point 6 feet below the lowest trolley feeders or other supply conductors, but need not extend below the top of any mechanical protection which may be provided near the ground.

Exception: Communication cables may be run vertically on the pole through space occupied by railroad-signal supply circuits in the lower position, as permitted in WAC 296-44-298(2)(c), without insulating covering within the supply space.

(b) Communication conductors. Vertical runs of insulated communication conductors shall be covered with wood molding, or other suitable insulating material, to the extent required for metal-sheathed communication cables in (7)(a) above, where such conductors pass trolley feeders or other supply conductors.

Exception: Communication conductors may be run vertically on the pole through space occupied by railroad-signal supply circuits in the lower position, as permitted in WAC 296-44-298(2)(c), without insulating covering within the supply space.

(c) Communication grounding conductors. Vertical communication grounding conductors shall be covered with wood molding or other insulating material between points at least 6 feet below and 40 inches above any trolley feeders or other supply line conductors by which they pass.

Exception: Communication grounding conductors may be run vertically on the pole through space occupied by railroad-signal supply circuits in the lower position, as permitted in WAC 296-44-298(2)(c) without insulating covering within the supply space.

(d) Separation from through bolts. Vertical runs of communication conductors shall be separated from the ends of through bolts associated with supply-line equipment by one-eighth of the circumference of the pole

where practicable, but in no case less than 2 inches. [§ 23 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-340 Grades of construction—General. For the purpose of "Strength requirements", sections (WAC 296-44-361 et seq.) and "Line insulators", sections (WAC 296-44-373 et seq.) of this code, conductors and their supporting structures are classified under the grades specified in this section on the basis of the relative hazard existing. [§ 24 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-343 Grades of construction—Application of grades of construction to different situations.
 (1) **Supply cables.** For the purposes of these rules, supply cables are divided into two classes as follows:

(a) Specially installed cables. In this class are included metal-sheathed supply cables installed in accordance with WAC 296-44-361(7)(a).

Note: Such cables are sometimes permitted to have a lower grade of construction than open-wire supply conductors of the same voltage.

(b) Other cables. In this class are included all other supply cables.

Note: Such cables are required to have the same grade of construction as open-wire supply conductors of the same voltage.

(2) **Two or more conditions.** In any case where two or more conditions affecting the grade of construction exist, the grade of construction used shall be the highest one required by any of the conditions.

(3) **Order of grades.** For supply and communication conductors and supporting structures, the relative order of grades is B, C, and N, grade B being the highest. Where grades D and N are specified for communication lines, grade D is the higher.

Note: Grade D cannot be directly compared with grades B and C, but subsection (4)(c)(iii) below provides for cases where these two conditions are present.

(4) **At crossings.**

(a) Grade of upper line. Conductors and supporting structures of a line crossing over another line shall have the grade of construction specified in subsection (4)(c) below and WAC 296-44-346 and 296-44-349.

(b) Grade of lower line. Conductors and supporting structures of a line crossing under another line need only have the grades of construction which would be required if the line at the higher level were not there.

(c) Multiple crossing.

(i) Where a line crosses in one span over two other lines. The grade of construction of the uppermost line shall be not less than the highest grade which would be required of either one of the lower lines if it crossed the other lower line.

Example: If a 2,300-volt line crosses in the same span over a communication line and a direct-current trolley contact conductor of more than 750 volts, the 2,300-volt line is required to comply with grade B construction at the crossing. This is a double crossing and introduces a

greater hazard than where the upper supply line crosses the communication line only.

(ii) Where one line crosses over a span in another line, which span is in turn involved in a second crossing. The grade of construction for the highest line shall be not less than that required for the next lower line.

Exception: This requirement does not apply when the two upper lines are of such a nature and have such circuit protection that the danger of causing a break in the lower of these two lines by mechanical or electrical contact is eliminated.

(iii) Where communication conductors cross over supply conductors and railroad tracks in the same span. The grades of construction shall be in accordance with Table 13.

Recommendation: It is recommended that the placing of communication conductors above supply conductors at crossing, conflicts, or on jointly used poles, be avoided unless the supply conductors are trolley contact conductors and their associated feeders.

TABLE 13.—Grades of construction for communication conductors crossing over railroad tracks and supply lines

When crossing over—	Communication conductor grades
Railroad tracks and supply lines of 0 to 750 volts to ground, or specially installed supply cables of all voltages	D
Railroad tracks and supply lines exceeding 750 volts to ground	B

(5) **Conflicts.**

(a) How determined. Where two lines are adjacent (except at crossing spans) the distance between them and the relative heights above ground of poles and of conductors of each line determine whether conflict exists, and, if so, whether the conflict is a structure conflict (see definition) or a conductor conflict (see definition), or both.

(b) Conductor conflict. At conductor conflicts, the grade of construction of the conflicting conductor shall be as required by subsection (4)(c) above and WAC 296-44-346.

(c) Structure conflict. At structure conflicts, the grade of construction of the conflicting structure shall be as required by WAC 296-44-349. [§ 24 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-346 Grades of construction—Grades of construction for conductors. The grades of construction required for conductors of all classes in different situations are given in Tables 14 and 15. For the purpose of these tables certain classes of circuits are

treated as follows: (1) **Status of constant-current circuits.** The grade of construction for a constant-current supply circuit involved with a communication circuit and not in specially installed cable shall be based on either its current rating or on the open-circuit voltage rating of the transformer supplying such circuit, as set forth in Tables 14 and 15. In all other cases the grade of construction for a constant-current circuit shall be based on its nominal full-load voltage.

(2) **Status of railway feeders and trolley contact conductors.** In determining grades of construction where railway feeders and trolley-contact conductors are involved, they shall be considered as other supply conductors of the same voltage.

Exception: Direct-current trolley circuits exceeding 750 volts to ground where crossing over, conflicting with, or on jointly used poles with and above communication

circuits, shall have the grades of construction specified in Table 14 for direct-current railway feeders.

(3) **Status of communication circuits used exclusively in the operation of supply lines.** In determining grades of construction where communication circuits used exclusively in the operation of supply lines are concerned, they shall be considered as ordinary communication circuits when run as such (see WAC 296-44-424(1)(c)) and as supply circuits when run as such (see WAC 296-44-424(1)(d)).

Exception: Communication circuits located below supply circuit with which they are used shall not require such supply circuits to meet any rules for grade of construction other than that the sizes of such supply conductors shall be not less than required for grade C (see WAC 296-44-364(6)(b)).

TABLE 14.—Grades of construction for supply conductors alone, at crossings, at conflicts, or on same poles with other conductors

(All voltages are between wires except as indicated. Corresponding voltages to grounded neutral of grounded circuits are shown in parentheses. In applying the table to two-wire grounded circuits use the "to neutral" voltage.)

Conductors, Tracks and Right of Ways at Lower Levels	Supply Conductors at Higher Levels		Constant-potential supply conductors other than direct-current railway feeders												Constant current supply conductors				Direct current railway feeders				Communication conductors used exclusively in the operation of, and run as, supply lines			
	0 to 750 Volts (0 to 750 Volts to Neutral)		750 to 5000 Volts (750 to 2900 Volts to Neutral)				5000 to 8700 Volts (2900 to 5000 Volts to Neutral)				Exceeding 8700 Volts (Exceeding 5000 Volts to Neutral)				0 to 7.5 Amperes		Exceeding 7.5 Amperes		0 to 750 Volts		Exceeding 750 Volts					
	Urban	Rural	Urban	Cable	Rural	Open or Cable	Urban	Cable	Rural	Open or Cable	Urban	Cable	Rural	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable			
	Open or Cable	Open or Cable	Open	Cable	Open or Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable	Open	Cable			
Fenced right of ways	N	N	^b N	N	N	N	^b N	N	N	N	^b N	^b N	N	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*C or N *See Rule 242-C			
Elsewhere than on fenced right of ways	N	N	C	N	N	C	N	N	N	^c B	C	N	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*C or N *See Rule 242-C				
Railroad tracks—Main or Minor	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B		
Street-railway tracks having no overhead contact conductor	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N			
Constant-potential supply conductors	0-750 Volts (0-750 Volts to Neutral)		Open or Cable	N	N	C	N	N	C	N	N	N	^c B	C	^d C	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*B, C or N *See Rule 242-C	
	750-5000 Volts (750 to 2900 Volts to Neutral)		Open	^c C	N	C	C	N	C	C	N	N	^c B	C	N	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*B, C or N *See Rule 242-C	
	5000 to 8700 Volts (2900 to 5000 Volts to Neutral)		Open	^c C	N	C	C	N	C	C	N	N	^c B	C	N	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*B, C or N *See Rule 242-C	
	Exceeding 8700 Volts (Exceeding 5000 Volts to Neutral)		Open	^c B	^c C	B	B	N	B	B	N	N	^c B	C	N	N	*B, C or N *See Rule 242-A				*B, C or N *See Rule 242-B				*B, C or N *See Rule 242-C	
Constant current supply conductors—open or cable		*B, C or N *See Rule 242-A																								
Direct current railway feeders—open or cable		*B, C or N *See Rule 242-B																								
Trolley contact conductors—alternating or direct current		*B, C or N *See Rule 242-B																								
Communication conductors, open or cable, used exclusively in the operation of supply lines		*B, C or N *See Rule 242-C																								
Communication conductors—urban or rural, open or cable		Major	N	N	C	C	C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	^g B	^h C	
		Minor	N	N	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	

a. The words "open" and "cable" appearing in the headings have the following meanings as applied to supply conductors: "Cable" means the specially installed cables described in WAC 296-44-343(1)(a). "Open" means open wire and also supply cables not "specially installed."

b. Where lines are located so that they can fall outside the fenced right of way into urban districts, the construction shall comply with the grades specified for lines not on fenced right of ways for corresponding voltages.

c. If circumstances within a given area warrant it, supply conductors need only meet the requirements of

grade C construction if the supply circuits are so constructed, operated, and maintained that such circuits will be promptly deenergized, both initially and following subsequent breaker operations, in the event of a contact with lower supply conductors or other grounded objects.

d. Grade N construction may be used, if crossing over or conflicting with, supply services only.

e. If the wires are service drops, they may have grade N sizes and sags as set forth in tables 28 and 29 (WAC 296-44-370(5)).

f. Grade N construction may be used where the communication conductors consist only of not more than 1 insulated twisted-pair or parallel-lay conductor, or

where 2 or more such insulated conductors are involved and these consist of service drops not grouped together in a single run.

g. The supply conductors need only meet the requirements of grade C construction if both of the following conditions are fulfilled:

(1) The supply and communication circuits are so constructed, operated and maintained that the supply circuits will be promptly deenergized, both initially and following subsequent breaker operations, in the event of a contact with the communication plant.

(2) The voltage and current impressed on the communication plant in the event of a contact with the supply conductors are not in excess of the safe operating limit of the communication protective devices.

h. Grade C construction applies to any supply cable on jointly used poles if carried above communication attachments and supported on an effectively grounded messenger.

i. Grade C construction may be used if the open-circuit voltage of the transformer supplying the circuit does not exceed 2,900 volts.

*Rules 242A, 242B and 242C are now codified as subsections (1), (2), and (3) of WAC 296-44-346.

(4) **Status of fire-alarm conductors.** In determining grades of construction where fire-alarm conductors are concerned, they shall be considered as other communication circuits.

Exception: Fire-alarm conductors shall always meet grade D where the span length is from 0 to 150 feet, and grade C where the span length exceeds 150 feet.

(5) **Status of neutral conductors of supply circuits.** Supply-circuit neutral conductors, which are effectively grounded throughout their length and are not located above supply conductors of more than 750 volts to ground, shall have the same grade of construction as supply conductors of not more than 750 volts to ground, except that they need not meet any insulation requirements. Other neutral conductors shall have the same grade of construction as the phase conductors of the supply circuits with which they are associated.

TABLE 15.—Grades of construction for communication conductors alone, or in upper position at crossings, at conflicts, or on joint poles

(All voltages are to ground, which, for ungrounded circuits, means the highest voltage between any two conductors.)

Conductors, tracks, and rights-of-way at lower levels	Communication conductors at higher levels ¹	Communication conductors, rural or urban, open or cable, including communication conductors run as such, but used exclusively in the operation of supply lines	
		Major	Minor
Fenced rights-of-way		N	N
Elsewhere than on fenced rights-of-way		N	N
Railroad tracks—main or minor		D	D
Street—railway tracks having no overhead-contact wire		N	N
Constant-potential supply conductors ²	0 to 750 volts .. Open or cable...	N	N
	750 to 2,900 volts .. do.	C	C
	Exceeding 2,900 volts .. (Open .. Cable ..) Open ³	B	C
Constant-current supply conductors ²	0 to 7.5 amperes .. do ³	C	C
	Exceeding 7.5 amperes .. do ³	B ⁴	C
Direct-current railway feeders ²	0 to 750 volts .. Open or cable...	N	N
	Exceeding 750 volts .. do.	B	C
Trolley-contact conductors	0 to 750 volts .. ac or dc	C	C
	Exceeding 750 volts .. { ac	B or C	B or C
	Exceeding 750 volts .. { dc	B	C
Communication conductors, open or cable, used exclusively in the operation of supply lines		B, C, or N ⁶	
Communication conductors, open or cable, urban or rural, major or minor		N	

¹ It is recommended that the placing of communication conductors above supply conductors at crossings, conflicts, or on jointly used poles be avoided, unless the supply conductors are trolley-contact conductors and their associated feeders.

² The words "open" and "cable" appearing in the headings have the following meaning as applied to supply conductors: "Cable" means the specially installed cables described in WAC 296-44-343(1)(a). "Open" means open wire and also supply cables not specially installed.

³ Where constant-current circuits are in specially installed cable, they are considered on the basis of the nominal full-load voltage.

⁴ Grade C construction may be used if the open-circuit voltage of the transformer supplying the circuit does not exceed 2,900 volts.

⁵ See WAC 296-44-346(2).

⁶ See WAC 296-44-346(3).

[§ 24 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-349 Grades of construction—
Grades of supporting structures. (1) Pole or towers. The grade of construction shall be that required for the highest grade of conductors supported.

Exception 1: The grade of construction of jointly used poles, or poles used only by communication lines, need not be increased merely because of the fact that communication wires carried on such poles cross over trolley contact conductors of 0 to 750 volts to ground.

Exception 2: Poles carrying grade C or D fire-alarm conductors, where alone, or where concerned only with

other communication conductors, need meet only the requirements of grade N.

Exception 3: Poles carrying supply service loops of 0 to 750 volts to ground shall have at least the grade of construction required for supply line conductors of the same voltage.

Exception 4: Where communication lines cross over supply conductors and a railroad in the same span and grade B is required by WAC 296-44-343(4)(c)(iii) for the communication conductors, due to the presence of railroad tracks, the grade of the poles or towers shall be D.

Exception 5: At structure conflicts, even though no conductor conflict exists, the grade of construction which would be required by WAC 296-44-346, if the conductors were in conflict, shall be applied to the pole or tower.

Note: This requirement may result in a higher grade of construction for the pole or tower than for the conductors carried thereon.

Exception 6: In the case where a structure conflict does not exist, but any conductor is in conductor conflict, the grade of construction of the pole or tower is not required to meet the conductor grade due to the conductor conflict.

(2) **Crossarms.** The grade of construction shall be that required for the lightest grade of conductors carried by the crossarm concerned.

Exception 1: The grade of construction of crossarms carrying only communication conductors need not be increased merely because of the fact that such conductors cross over trolley-contact conductors of 0 to 750 volts to ground.

Exception 2: Crossarms carrying grade C or D fire-alarm conductors, where alone or where concerned with other communication conductors, need meet only the requirements for grade N.

Exception 3: Crossarms carrying supply service loops of 0 to 750 volts to ground shall have at least the grade of construction required for supply line conductors of the same voltage.

Exception 4: Where communication lines cross over supply conductors and a railroad in the same span and grade B is required by WAC 296-44-343(4)(c)(iii) for the communication conductors due to the presence of railroad tracks, the grade of the crossarm shall be D.

(3) **Pins, insulators, and conductor fastenings.** The grade of construction shall be that required for the conductor concerned.

Exception 1: The grade of construction of pins, insulators, and conductor fastenings carrying only communication conductors need not be increased merely because of the fact that such conductors cross over trolley-contact conductors of 0 to 750 volts to ground.

Exception 2: In the case of grade C or D fire-alarm conductors where alone, or where concerned only with other communication conductors, pins, insulators, and conductor fastenings need meet only the requirements for grade N.

Exception 3: In the case of supply service loops of 0 to 750 volts to ground, pins, insulators, and conductor fastenings shall have at least the same grade of construction as required for supply-line conductors of the same voltage.

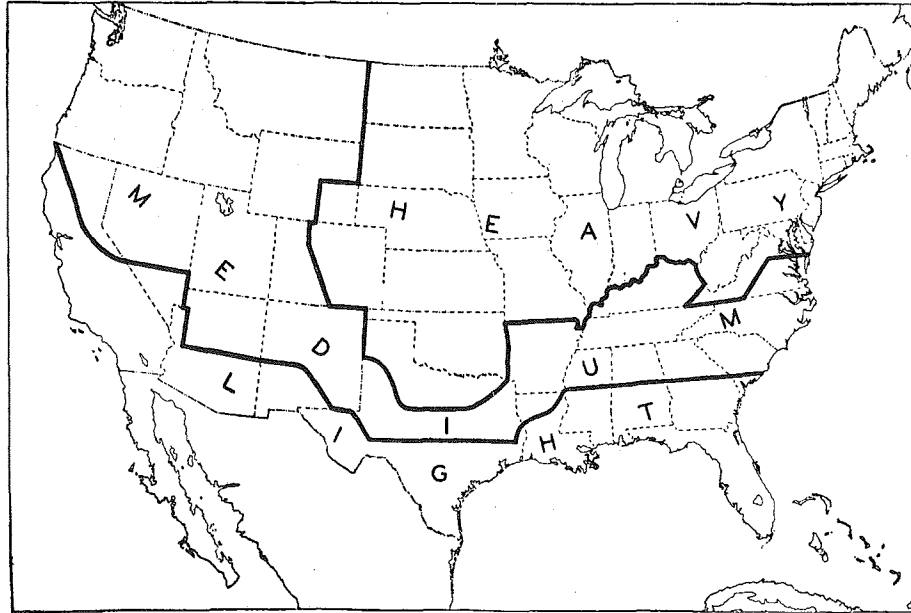
Exception 4: Where communication lines cross over supply conductors and a railroad in the same span, and grade B is required by WAC 296-44-343(4)(c)(iii) for the communication conductors due to the presence of railroad tracks, the grade of pins, insulators, and conductor fastenings shall be D.

Exception 5: In case communication conductors are required to meet grade B or C, the insulators need meet only the requirements for mechanical strength for these grades. [§ 24 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-352 Loading for grades B, C, and D—General loading map. Three general degrees of loading due to weather conditions are recognized and are designated as heavy, medium, and light loading. The map in Figure 1 shows the districts in the United States in which these loadings are normally applicable. It is recognized that loadings in certain areas in each of the loading districts are greater, and in some cases may be less, than those specified for the districts. Any variation in the general loadings specified should be based on factual weather and experience data for the local area involved.

Note: The localities in the different groups are classed according to the relative prevalence of high wind velocity and thickness of ice which accumulates on wires, light loading being, in general, for places where little, if any, ice ever accumulates on wires.

Where high wind velocities are frequent in a given place the loading for that place may be classed as heavy, even though ice does not accumulate to any greater extent than at some other place having less severe winds which has been classed as a medium loading district.



[§ 25 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-355 Loading for grades B, C, and D—Conductor loading. The loading on conductors shall be assumed to be the resultant loading per foot equivalent to the vertical load per foot of the conductor, ice-covered where specified, combined with the transverse loading per foot due to a transverse, horizontal wind pressure upon the projected area of the conductor, ice-covered where specified, to which equivalent resultant shall be added a constant. In the tabulation below are the values for ice, wind, temperature, and constants which shall be used to determine the conductor loading.

	Loading district		
	Heavy	Medium	Light
Radial thickness of ice (in.)	0.50	0.25	0
Horizontal wind pressure in pounds per square foot	4	4	9
Temperature (°F)	0	+15	+30

	Loading district		
	Heavy	Medium	Light
Constant to be added to the resultant in pounds per foot:			
For bare conductors of copper, steel, copper alloy, copper-covered steel, and combinations thereof	0.29	0.19	0.05
For bare conductors of aluminum (with or without steel reinforcement)	.31	.22	.05
For weather-proof and similar covered conductors (all materials)	.31	.22	.05

Note: Since heavy ice does not often form on conductors in a heavy wind, the transverse loading assumed is deemed sufficient for the purpose, but is not sufficient to represent the vertical (or combined) load which is imposed on conductors by the heavy deposits of ice which frequently form in comparatively still air. In order to apply a total loading to conductors representing more nearly the conditions encountered in practice, constants have been added to the conductor loading which make no substantial change in the

conductor loading specified in the fourth edition of this code.

Where cables are concerned, the specified loadings shall be applied to both cable and messenger.

In applying loadings to bare stranded conductors, the coating of ice shall be considered as a hollow cylinder touching the outer strands. [§ 25 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-358 Loading for grades B, C, and D—Loads upon line supports. (1) **Assumed vertical loading.** The vertical loads upon poles, towers, foundations, crossarms, pins, insulators, and conductor fastenings shall be their own weight plus the superimposed weight which they support, including all wires and cables, ice-coated in heavy and medium loading districts, together with the effect of any difference in elevation of supports. The radial thickness of ice shall be computed only upon wires, cables, and messengers, and shall be taken as the following:

- Heavy loading district (H), 0.50 inch of ice.
- Medium loading district (M), 0.25 inch of ice.
- Light loading district (L), no ice.

Ice is assumed to weigh 57 pounds per cubic foot.

Note: The weight of ice upon supports is ignored for the sake of simplicity.

(2) **Assumed transverse loading.** In computing the stresses in poles, towers, and side guys the loading shall be taken as one of the following according to climatic conditions of the locality concerned.

(a) **Heavy loading (H).** A horizontal wind pressure, at right angles to the direction of the line, of 4 pounds per square foot upon the projected area of cylindrical surfaces of all supported conductors and messengers, when covered with a layer of ice 0.5 inches in radial thickness and on surfaces of the poles and towers without ice covering, shall be called heavy loading. (See (d) and (e) following.)

For supporting structures carrying more than 10 wires, not including cables supported by messengers, where the pin spacing does not exceed 15 inches, the transverse load shall be calculated on two-thirds of the total number of such wires with a minimum of 10 wires.

(b) **Medium loading (M).** A horizontal wind pressure at right angles to the direction of the line, of 4 pounds per square foot upon the projected area of cylindrical surfaces of all supported conductors and messengers when covered with a layer of ice 0.25 inch in radial thickness and on the surfaces of the poles and towers without ice covering, shall be called medium loading. (See (d) and (e) following.)

For supporting structures carrying more than 10 wires, not including cables supported by messengers, where the pin spacing does not exceed 15 inches, the transverse load shall be calculated on two-thirds of the total number of such wires with a minimum of 10 wires.

(c) **Light loading (L).** A horizontal wind pressure at right angles to the direction of the line of 9 pounds per square foot upon the projected area of cylindrical surfaces of all supported conductors and messengers, poles

and towers without ice covering, shall be called light loading. (See (d) and (e) following.)

(d) **Trolley-contact conductors.** When a trolley-contact conductor is supported on a pole it shall be included in the computation of the transverse load on the structure.

(e) **Flat surfaces.** For flat surfaces the assumed unit wind pressure shall be increased by 60 percent. Where latticed structures are concerned, the actual exposed area of one lateral face shall be increased by 50 percent to allow for the pressure on the opposite face; this total, however, need not exceed the pressure which would occur on a solid structure of the same outside dimensions. The results obtained by more exact calculations may be substituted for the values obtained by this simple rule.

(f) **At angles (combined longitudinal and transverse loading).** Where a change in direction of wires occurs, the loading upon the structure, including guys, shall be assumed to be a resultant load equal to the vector sum of the transverse wind load given in (a), (b), or (c) above and the resultant load imposed by the wires due to their change in direction. In obtaining these loadings, a wind direction shall be assumed which will give the maximum resultant load, proper reduction being made in loading to account for the reduced wind pressure on the wires resulting from the angularity of the application of the wind to the wires.

(3) **Assumed longitudinal loading.**

(a) **Change in grade of construction.** The longitudinal loading upon supporting structures, including poles, towers, and guys at ends of sections required to be of grade B construction, when located in lines of lower than grade B construction, shall be taken as an unbalanced pull in the direction of the higher grade section equal to the pull of two-thirds of the conductors supported thereon which are smaller than No. 2 AWG, the conductor loading to be that given in WAC 296-44-355, and such two-thirds of the conductors being selected so as to produce the maximum stress in the supports.

If the application of the above results in a fractional part of a conductor, the nearest whole number shall be used. In no case shall the assumed unbalanced pull on the supporting structure be less than the maximum loaded tension in any two of the conductors carried (including overhead ground wires), such two conductors being selected so as to produce the maximum stress in the supports.

(b) **Jointly used poles at crossings over railroads or communication lines.** Where a joint line crosses over a railroad or a communication line and grade B is required for the crossing span, the tension in the communication conductors of the joint line may be considered as limited to one-half their breaking strength, provided they are smaller than No. 8 Stl. WG, if of steel, or No. 6 AWG, if of copper, regardless of how small the initial sags of the communication conductors at 60° F.

(c) **Dead-ends.** The longitudinal loading upon supporting structures shall be taken as an unbalanced pull equal to the tensions of all conductors and messengers (including overhead ground wires), under the conditions of conductor loading specified in WAC 296-44-355.

(d) Communication conductors on unguyed supports at railroad crossings. The longitudinal loading shall be assumed equal to an unbalanced pull in the direction of the crossing of all open-wire conductors supported, the pull of each conductor being taken as 50 percent of its ultimate strength in the heavy loading district, 33-1/3 percent in the medium loading district, and 22 1/4 percent in the light loading district.

(4) Average span lengths.

(a) General. The calculated transverse loads upon poles, towers, and crossarms, except as provided in (b) below, shall be based upon the average span length of a section of line that is reasonably uniform as to height, number of wires, grade, and span length. In no case shall the average value taken be less than 75 percent or more than 125 percent of the actual average of the two spans adjacent to the structure concerned.

(b) Crossings. In the case of crossings over railroads or communication lines (other than minor communication lines) the actual lengths of the two spans adjacent to the two structures concerned shall be used.

(5) Simultaneous application of loads.

(a) When calculating transverse strength, the assumed transverse and vertical loads shall be taken as acting simultaneously.

(b) In calculating longitudinal strength, the assumed longitudinal loads shall be taken without consideration of the vertical or transverse loads. [§ 25 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-361 Strength requirements—Preliminary assumptions. It is recognized that deformation, deflection, or displacement of parts of the structure will, in some cases, change the effects of the loads assumed. In the calculation of stresses, however, no allowance shall be made for such deformation, deflection, or displacement of supporting structures (including poles, towers, guys, crossarms, pins, conductor fastenings, and suspension insulators) unless the methods used to evaluate them have been approved by the administrative authority. [§ 26 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-364 Strength requirements—Grades B and C construction. (1) Poles and towers. The strength requirements for poles and towers may be met by the structures alone or with the aid of guys or braces.

(a) Average strength of three poles. A pole (single-base structure) not individually meeting the transverse strength requirements will be permitted when reinforced by a stronger pole on each side, if the average strength of the three poles meets the transverse strength requirements, and the weak pole has not less than 75 percent of the required strength.

An extra pole inserted in a normal span for the purpose of supporting a service loop may be ignored, if desired, in the calculation of the strength of the line.

Exception: In the case of crossings over railroads or communication lines (other than minor communication lines), the actual strengths of the crossing poles shall be used.

(b) Reinforced-concrete poles. Reinforced-concrete poles shall be of such material and dimensions as to withstand, for vertical and transverse strength, the loads assumed in WAC 296-44-358(1) and (2), and for longitudinal strength the loads in WAC 296-44-358(3), without exceeding the following percentages of their ultimate strength at the ground line for unguyed poles, or at the point of guy attachment for guyed poles. (Where guys are used, see subsection (3) of this section.)

	Percentage of ultimate strength for reinforced-concrete poles	
	Grade B	Grade C
For transverse strength (when installed)	25	37.5
For longitudinal strength (at all times):		
In general.....	100	No requirement
At dead-ends.....	50	75.0

(c) Steel supporting structures. In the design of steel structures, the term "overload capacity factor" referred to in Table 16 is to be interpreted in such a manner that the completed structure, if tested, shall support without permanent deflection the maximum loading to which it will be subjected as specified in WAC 296-44-352 through 296-44-358, multiplied by the factors given in Table 16. The absence of permanent set on the structure indicates that no part has been stressed beyond the yield point. Allowance should be made for bolt slip.

Steel supports, steel towers, and metal poles shall be designed and constructed so as to meet the following requirements:

(i) Vertical and transverse strength. The completed structure shall be so designed and of sufficient strength as to provide overload capacity factors specified in Table 16 under the vertical and transverse loading specified in WAC 296-44-358(1) and 296-44-358(2)(a) to (2)(e), inclusive.

(ii) Longitudinal strength. *Grade B.* The completed structure shall be so designed and of sufficient strength as to provide overload capacity factors specified in Table 16 under the longitudinal loading specified in WAC 296-44-358(3).

Grade C. No longitudinal strength requirements except at dead-ends.

(iii) Minimum strength. Steel structures shall have strength sufficient to withstand, with an overload capacity factor of 1.1, a transverse load on the structures without conductors, equal to six times the specified wind pressure.

(iv) Strength at angles in a line. At an angle in a line having supports of steel poles or towers, the strength of the support shall be sufficient to withstand a combination of the transverse and longitudinal loadings specified in WAC 296-44-358(2)(f). For grade B the transverse load shall be multiplied by 1.54, and for grade C by 2.00, before combining with the load arising from change in direction of conductors. The allowable overload capacity factor at dead-ends given in Table 16 shall be provided for the total load thus computed.

TABLE 16.—Minimum overload capacity factors of completed structures

(Based on yield point of steel)

	Overload capacity factors	
	Grade B	Grade C
Vertical strength	1.27	1.10
Transverse strength	2.54	2.20
Longitudinal strength:		
At crossings—		
In general	1.10	No requirement.
At dead-ends	1.65	1.10
Elsewhere—		
In general	1.00	No requirement.
At dead-ends	1.65	1.10

(v) Thickness of steel. The thickness of metal in members of steel poles or towers shall be not less than the following:

TABLE 17.—Thickness of steel

	Thickness of main members of crossarms and legs	Thickness of other members
	Inches	Inches
For localities where experience has shown deterioration of protective covering is rapid	1/4	3/16
For other localities	3/16	1/8

(vi) Unsupported length of compression members. The ratio of L, the unsupported length of a compression member, to R, the least radius of gyration of the member, shall not exceed the following (these figures do not apply to the complete structure):

TABLE 18.—L/R for compression members

Kind of compression member	L/R
Leg Members	150
Other members having figured stresses	200
Secondary members without figured stresses .	250

(vii) General construction features. Steel poles or towers, including parts of footings above ground, shall be constructed so that all parts are accessible for inspection, cleaning, and painting, and so that pockets are not formed in which water can collect.

Recommendation: Unless sample structures, or similar ones, have been tested to assure the compliance of structures in any line with these requirements, it is recommended that structures be designed to have a computed strength at least 10 percent greater than that required by these rules.

(viii) Protective covering or treatment. All iron or steel poles, towers, or supporting structures shall be protected by galvanizing, painting, or other treatment which will effectively retard corrosion. Such protective covering shall be adequately maintained.

(d) Wood poles. Wood poles shall be of such material and dimensions as to meet the following requirements (where guys are used, see subsection (3) of this section):

(i) Transverse strength. Wood poles shall withstand the transverse and vertical loads assumed in WAC 296-44-358(1) and 296-44-358(2)(a) to (2)(d), inclusive, without exceeding at the ground line for unguyed poled, or at the point of guy attachment for guyed poled, the appropriate percentages of their ultimate stress given in Table 20.

(ii) Longitudinal and dead-end strength. The longitudinal and dead-end strength of wood poles shall be such that they will withstand the appropriate longitudinal loading specified in WAC 296-44-358(3), without exceeding, at the ground line for unguyed poles or at the point of guy attachment for guyed poles, the following percentages of the applicable ultimate fiber stress given in Table 19.

	Percentage of ultimate fiber stress for wood poles	
	Grade B	Grade C
Longitudinal:		
When installed	75 ¹	No requirement.
At replacement	100	Do.
Dead-ends:		
When installed	50 ¹	75 ¹
At replacement	75	100

¹Where supply lines alone are involved and built for a fixed period of temporary service not exceeding 5 years the prescribed percentage of fiber stress at installation may be increased, provided the percentage of ultimate fiber stress required at replacement is not exceeded during the life of the line.

Exception 1: At a Grade B crossing, in a straight section of line, wood poles of approximately round cross section, complying with the transverse strength requirements of subsection (1)(d)(i), without the use of transverse guys, shall be considered as having the required longitudinal strength. This exception does not modify the requirements of this rule for dead-ends.

Exception 2: At a Grade B crossing of a supply line over a highway and a communication line in the same span, where there is an angle in the supply line, wood poles of approximately round cross section shall be considered as having the required longitudinal strength if all of the following conditions obtain:

1. The angle is not over 20 degrees.
2. The corner pole is guyed in the plane of the resultant of the conductor tensions on both sides of the corner pole; the tension in this guy not to exceed 50 percent of its ultimate strength under the loading of WAC 296-44-358(2)(f).

Exception 3: The corner pole has sufficient strength to withstand, without guys, the transverse loading of WAC 296-44-358(2)(a), (b) or (c), which would exist if there

were no angle at that pole, without exceeding 25 percent of its ultimate stress when installed, or 37 1/2 percent at replacement.

(iii) Ultimate fiber stress. Different kinds of wood poles are considered as having the ultimate fiber stresses given in Table 19.

TABLE 19.—Ultimate fiber stresses of wood poles

Kind of wood	Ultimate fiber stress
	lb./sq. in.
Creosoted southern pine	7,400
Douglas fir	7,400
Lodgepole pine	6,600
Chestnut	6,000
Western red cedar	5,600
Cypress	5,000
Northern white cedar	3,600
Redwood	3,600
Western Larch	8,400

When values for ultimate stresses of cypress and redwood have been approved as standard by the American Standards Association, such values shall be used in place of those given above.

(iv) Allowable percentages of ultimate stress. The allowable percentages of ultimate stress of treated and untreated poles to withstand vertical and transverse loads are given in Table 20, except as modified in the following paragraph.

At crossings where grade B construction is required, if the supply line is not maintained throughout (or between and including the nearest guyed points on each side of the crossing) so that the poles will not be stressed at any time in excess of 50 percent of their ultimate stress under the transverse loading assumed in WAC 296-44-358(2), the crossing poles, if unguyed, shall be of such strength that they will withstand the transverse loading assumptions of WAC 296-44-358(2)(a), (b) or (c), without exceeding 16 2/3 percent of their ultimate stress at installation or 25 percent at replacement. If the crossing poles are side guyed, such guys shall meet the requirements of subsection (3)(e) of this section.

TABLE 20.—Allowable percentages of ultimate stress for treated or untreated wood poles under vertical and transverse loading

	When installed	At replacement
Grade B	25.0	37.5
Grade C:		
At crossings	37.5	75.0
Elsewhere	50.0	75.0

(v) Freedom from defects. Wood pole shall be of suitable and selected timber free from observable defects that would decrease their strength or durability.

(vi) Minimum pole sizes. Wood poles shall have a nominal top circumference of not less than 15 inches.

(vii) Spliced and stub-reinforced poles. Spliced poles shall not be used at crossings, conflicts, or joint-use sections requiring grades B or C construction.

Except at crossings over major railroad tracks, the use of stub reinforcements that develop the required strength of the pole is permitted, provided the pole above the ground is in good condition and is of sufficient size to develop its required strength.

(e) Transverse-strength requirements for structures where side guying is required, but can only be installed at a distance.

Grade B. In the case of structures where, because of very heavy or numerous conductors or relatively long spans, the transverse-strength requirements of this section can not be met except by the use of side guys or special structures, and it is physically impracticable to employ side guys, the transverse-strength requirements may be met by side-guying the line at each side of, and as near as practicable to, the crossing or other transversely weak structure, and with a distance between such side-guyed structures of not over 800 feet, provided that:

(i) The side-guyed structures for each such section of 800 feet or less shall be constructed to withstand the calculated transverse load due to wind on the supports and ice-covered conductors, on the entire section between the side-guyed structures.

(ii) The line between such side-guyed structures shall be substantially in a straight line and the average length of span between the side-guyed structures shall be not in excess of 150 feet.

(iii) The entire section between the transversely strong structures shall comply with the highest grade of construction concerned in the given section, except as to the transverse strength of the intermediate poles or towers.

Grade 3. The above provision is not applicable to grade C.

(f) Longitudinal-strength requirements for sections of higher grade in lines of a lower grade of construction.

(i) Methods of providing longitudinal strength.

Grade B. The longitudinal-strength requirements for sections of line of higher grade in lines of a lower grade (for assumed longitudinal loading, see WAC 296-44-358(3)(a)) are usually met by placing supporting structures of the required longitudinal strength at either end of the higher-grade section of the line. Where this is impracticable, the supporting structures of the required longitudinal strength may be located one or more span lengths away from the section of higher grade, within 500 feet on either side and with not more than 800 feet between the longitudinally strong structures, provided such structures and the line between them meet the requirements as to transverse strength and stringing of conductors, of the highest grade occurring in the section, and provided that the line between the longitudinally strong structures is approximately straight or suitably guyed.

The requirements may also be met by distributing the head guys over two or more structures on either side of the crossing, such structures and the line between them complying with the requirements for the crossing as to transverse strength and as to conductors and their fastenings.

Where it is impracticable to provide the longitudinal strength, the longitudinal loads shall be reduced by increasing the conductor sags. This may require greater conductor separations. (See WAC 296-44-325(1)(b)(i).)

Grade C. The above provision is not applicable to grade C.

(ii) Flexible supports.

Grade B. When supports of the section of higher grade are capable of considerable deflection in the direction of the line, as with wood or concrete poles, or some types of metal poles and towers, it may be necessary to increase the normal clearances specified in WAC 296-44-310 through 296-44-337, or to provide head guys or special reinforcement to prevent such deflection.

So-called flexible steel towers or frames, if used at such locations, shall be adequately reinforced to meet the requirements of subsection (1)(c)(ii) of this section.

When the situation is one involving an isolated crossing of higher grade in a line of lower-grade construction, then the structure shall, when practicable, be head-guyed or otherwise reinforced to prevent reduction in the clearances required in WAC 296-44-310 through 296-44-337.

Grade C. The above provision is not applicable to grade C.

(g) Strength at angles in a line. At an angle in the line, the strength of a pole at the ground line, if not guyed, or at the point of guy attachment if guyed, shall be sufficient to withstand a combination of the transverse and longitudinal loadings specified in WAC 296-44-358(2)(f). For grade B the transverse load shall be multiplied by 2.0 and for grade C by 1.5, before combining with the load arising from change in direction of conductors. The allowable percentage of ultimate stress at dead-ends given in subsection (1)(d)(ii) of this section shall not be exceeded for the total load thus computed.

(2) Foundations.

(a) Use of foundations.

(i) Wood and reinforced-concrete poles. No special foundation construction is generally required.

(ii) Steel poles or towers. Steel poles or towers set in earth shall be suitably protected against injurious corrosion at and below the ground line.

(b) Strength of foundations.

(i) Steel supports. The foundations and footings shall be so designed and constructed as to withstand the stresses due to the loads assumed in WAC 296-44-358. Steel parts shall withstand these loads with the overload capacity factors specified in Table 16. Since in many localities the soil and climatic conditions are such as to alter the strength of foundations considerably from time to time, there should usually be provided a considerable margin of strength in foundations above that which (by calculation) will just withstand the loads under the assumption of average conditions of climate and soil.

(ii) Wood and concrete poles. Foundations and settings for unguyed poles shall be such as to withstand the loads assumed in WAC 296-44-358(1), (2), and (3).

(3) Guys.

(a) General. The general requirements for guys are covered under "Miscellaneous Requirements" (See WAC 296-44-400 through 296-44-427.)

(b) For poles in insecure earth. Where crossing poles are set in insecure earth the transverse strength requirements should, where practicable, be met by the use of side guys or braces.

(c) On steel structures. The use of guys to obtain compliance with these requirements is regarded as generally undesirable. When guys are necessarily used, the steel supports or towers, unless capable of considerable deflection, shall be regarded as taking all of the load up to their allowable working load, and the guys shall have sufficient strength to take the remainder of the assumed maximum load. (See subsection (1)(f)(ii) of this section for flexible supports.)

(d) On wood or concrete poles. When guys are used to meet the strength requirements for wood or concrete poles, they shall be considered as taking the entire load in the direction in which they act, the poles acting as struts only. Frequently the use of shorter spans or larger poles will permit the omission of guys at crossings.

(e) Strength of guys.

(i) Guys, when required, shall be of such material and dimensions as will withstand the transverse loads assumed in WAC 296-44-385(2)(a) to 296-44-358(2)(e), inclusive, and the longitudinal load assumed in WAC 296-44-358(3), without exceeding the following percentages of their ultimate strength:

	Percentage of ultimate strength	
	Grade B	Grade C
For transverse strength (when installed)	37.50	50.00
For longitudinal strength (at all times):		
In general	100.00	No requirement.
At dead-ends	66.67 ¹	87.50 ¹

¹If deflection of supporting structures is taken into account in the computation, 66 2/3 percent shall be reduced to 60 percent and 87 1/2 percent shall be reduced to 75 percent.

(ii) At an angle in the line, the strength of a transverse guy or guys shall be sufficient to withstand the combination of transverse and longitudinal loadings specified in WAC 296-44-358(2)(f). The transverse load shall be multiplied by 1.78 for both grades B and C before combining with the load arising from the change in direction of conductors. The allowable percentage of ultimate strength at dead-ends given in (i) above shall not be exceeded for the total load thus computed.

(4) Crossarms.

(a) Vertical strength. Crossarms shall, when installed, withstand the vertical loads specified in WAC 296-44-358(1) without the stress under these loads exceeding 50 percent of the assumed ultimate stress of the material. Metal crossarms, when used on wood poles to support electric-supply conductors, shall be grounded.

Exception: For built up steel crossarms on steel structures, see Table 16 for minimum overload capacity factors.

(b) Bracing. Crossarms shall be securely supported by bracing, if necessary, so as to support safely all other loads to which they may be subjected in use, including linemen working on them. Any crossarm or buckarm shall be capable of supporting a vertical load of 225 pounds at either extremity in addition to the weight of the conductors. This rule shall not apply to the top crossarm on poles used solely for communication circuits.

(c) Longitudinal strength.

(i) General. Crossarms shall withstand any unbalanced longitudinal loads to which they are exposed, with a limit of unbalanced tension where conductor pulls are normally balanced, of 700 pounds at the outer pin.

(ii) At dead-ends and at ends of higher-grade construction in line of lower grade.

Grade B. Wood crossarms shall be of sufficient strength to withstand at all times, without exceeding their ultimate stresses, an unbalanced pull equal to the tension in all supported conductors under the assumed conductor loading given in WAC 296-44-355. Steel arms shall withstand this load with the overload capacity factor for longitudinal loads given in Table 16.

Grade C. The above provisions do not apply to grade C.

(iii) At ends of transversely weak sections.

Grade B. The crossarms connected to the structure at each end of the transversely weak section, such as described in subsection (1)(e) of this section, shall be such as to withstand at all times without exceeding their ultimate stresses, under the conductor loading prescribed in WAC 296-44-355, an unbalanced load equivalent to the combined pull in the direction of the transversely weak section of all the conductors supported.

Grade C. The above provision does not apply to grade C.

(iv) Methods of meeting subsections (4)(c)(ii) and (iii) of this section.

Grade B. Where conductor tensions are limited to a maximum of 2,000 pounds per conductor, double wood crossarms fitted with spacing bolts equipped with spacing nuts and washers, pipe spacers, or similar construction, or with spacing blocks or plates, will be considered as meeting the strength requirements in (ii) and (iii) preceding.

Grade C. The above provisions do not apply to grade C.

(d) Dimensions of crossarms of selected yellow pine or fir. The cross-sectional dimensions of selected yellow pine or fir crossarms shall be not less than the values of Table 21.

TABLE 21.—Crossarm cross sections

Number of pins	Grade B	Grade C	
		Supply	Communication
	Inches	Inches	Inches
2 or 4.....	3 by 4	2 3/4 by 3 3/4	.....
6 or 8.....	3 1/4 by 4 1/4	3 by 4	.....
6.....	.....	.....	2 3/4 by 3 3/4
10.....	.....	.....	3 by 4

(e) Double crossarms or brackets.

Grade B. Where pin-type construction is used, two points of support shall be provided for each conductor by means of double crossarms or double brackets at each crossing structure, at ends of joint use or conflict sections, at dead-ends, and at corners where the angle of departure from a straight line exceeds 20 degrees.

Exception: Where communication cables or conductors cross below supply conductors and are attached to the same pole, the above does not apply unless another condition which requires double pins and fastenings for the supply conductors is involved.

Grade C. The above provision applies to grade C where supply conductors of more than 5,000 volts between wires (or of more than 2,900 volts to ground in the case of grounded neutral circuits) cross over minor communication lines at locations such that the supply pole is more than 6 feet from the nearest communication conductor, unless other means of providing equivalent safety and stress are agreed to be the parties involved.

(f) Location. In general, crossarms should be maintained at right angles to the axis of the pole and to the direction of the attached conductors. At crossings, crossarms should be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used.

(5) Pins and conductor fastenings.

(a) Longitudinal strength.

(i) General. Pins and ties or other conductor fastenings shall have sufficient strength to withstand an unbalanced tension in the conductor, up to a limit of 700 pounds per pin or fastening.

(ii) At dead-ends and at ends of higher-grade construction in line of lower grade.

Grade B. Pins and ties or other conductor fastenings connected to the structure at each end of the higher-grade section shall be of sufficient strength to withstand at all times without exceeding their ultimate strength, an unbalanced pull due to the conductor loading specified in WAC 296-44-355.

Grade C. The above provisions do not apply to grade C.

(iii) At ends of transversely weak sections.

Grade B. Pins and ties or other conductor fastenings connected to the structure at each end of the transversely weak section as described in subsection (1)(e) of this section shall be such as to withstand at all times without exceeding their ultimate strength under the conductor loading prescribed in WAC 296-44-355, the unbalanced pull in the direction of the transversely weak section of the conductor supported.

Grade C. The above provisions do not apply to grade C.

(iv) Method of meeting subsections (5)(a)(ii) and (5)(a)(iii) of this section.

Grade B. Where conductor tensions are limited to 2,000 pounds and such conductors are supported on pin insulators, double pins, and ties or equivalent fastenings will be considered to meet the requirements of (ii) and (iii) preceding.

Grade C. The above provision does not apply to grade C.

(b) Sharp edges on fastenings. Tie wires, fastenings, or supports shall have no sharp edges or burrs at contacts with the conductors.

(c) Height of pin. The height of the pin and the conductor fastenings and the material and cross section of the pin should be chosen so as to afford the required strength.

Note: The method of attaching conductors by suitable ties to single pin-type insulators mounted on 1 1/2 by 9 inch wood pins of locust or equivalent wood will usually provide strength up to 1,000 pounds conductor tension with the conductor 3.5 inches above the crossarm. Steel pins may afford greater strength, both for the pins and for the crossarms.

Grade B. Where pin-type construction is used, two points of support shall be provided for each conductor by means of double pins and conductor fastenings at each crossing structure, at ends of joint use or conflict sections, at dead-ends, and at angles where the angle of departure from a straight line exceeds 20 degrees.

Exception: Where communication cables or conductors cross below supply conductors and are attached to the same pole, the above does not apply unless another condition which requires double pins and fastenings for the supply conductors is involved.

Grade C. The above provision applies to grade C where supply conductors of more than 5,000 volts between wires (or of more than 2,900 volts to ground in the case of grounded neutral circuits) cross over minor communication lines at locations such that the supply pole is more than 6 feet from the nearest communication conductor, unless other means of providing equivalent safety and strength are agreed to be the parties involved.

(6) Open supply conductors.

(a) Material. Conductors shall be of material or combinations of materials which will not corrode excessively under the prevailing conditions.

Recommendation: It is recommended that hard-drawn or medium-hard-drawn copper wire (conforming to the specifications of the American Society for Testing Materials) be used instead of soft in new construction where bare wire or cable is used, especially for sizes smaller than No. 2.

(b) Minimum sizes of supply conductors. Supply conductors, both bare and covered, shall have an ultimate strength and an over-all diameter of metallic conductor not less than that of medium-hard-drawn copper of the gage size AWG shown in Table 22, except that conductors made entirely of bare or galvanized iron or steel shall have an over-all diameter not less than Stl. WG of the gage sizes shown.

Exception 1: At railroad crossings, for stranded conductors, other than those in which a central core wire is entirely covered by the outside wires, any individual wire of such a stranded conductor containing steel shall be not less than 0.100 inch in diameter if copper-covered

and not less than 0.115 inch in diameter if otherwise protected or if bare.

Exception 2: Supply service leads of 0 to 750 volts to ground may have the sizes set forth in WAC 296-44-370(5).

Exception 3: Where the short-span method of construction is employed in accordance with subsection 11, of this section, the conductor sizes and sags herein specified are not required.

TABLE 22.—Minimum over-all conductor sizes

Grade of construction	Gage size ¹
B	6
C	8

¹For No. 6 and No. 8 medium-hard-drawn copper wire the nominal diameters are 0.1620 and 0.1285 inch, and the minimum values of breaking load are 1,010 and 643.9 pounds, respectively. For steel wire gage the nominal diameters are 0.192 inch for No. 6 and 0.162 inch for No. 8.

(c) Lightning protection wires. Lightning-protection wires paralleling the line conductors shall be regarded in respect to size, material, and stringing requirements as supply conductors with which they are associated.

(d) Sags and tensions. Conductor sags shall be such that, under the assumed loading of WAC 296-44-355 for the district concerned, the tension of the conductor shall be not more than 60 percent of its ultimate strength. Also the tension at 60° F, without external load, shall not exceed the following percentage of the conductor ultimate strength:

Exception: In the case of conductors having a cross section of a generally triangular shape, such as cables composed of three wires, the final unloaded tension of 60° F. shall not exceed 30 percent of the ultimate strength of the conductor.

Note: The above limitations are based on the use of recognized methods for avoiding fatigue failures by minimizing chafing and stress concentration. If such practices are not followed, lower tensions should be employed.

(e) Splices and taps.

Grade B. Splices shall as far as practicable be avoided in the crossing and adjacent spans. If it is impracticable to avoid such splices, they shall be of such a type and so made as to have a strength substantially equal to that of the conductor in which they are placed. Taps shall be avoided in the crossing span where practicable, but if required shall be of a type which will not impair the strength of the conductors to which they are attached.

Grade C. The above does not apply to Grade C.

(f) Trolley contact conductors. In order to provide for wear, no trolley contact conductor shall be installed of less size than No. 0, if of copper, or No. 4, if of silicon bronze.

(7) Supply cables.

(a) Specially installed supply cables. Cables having effectively grounded continuous metal sheath or armor,

where located on jointly used poles, or where located on other poles and having a grade of construction less than that required for open wire supply lines of the same voltage, shall meet the requirements of (i), (ii), (iii), and (iv) below.

(i) Messengers. Messengers shall be stranded and of corrosion-resistant material, and shall not be stressed beyond 60 percent of their ultimate strength under the loadings specified in WAC 296-44-355.

(ii) Grounding of cable sheath and messenger. Each section of cable between splices shall be suitably and permanently bonded to the messenger wire at not less than two places. The messenger wire shall be grounded at the ends of the line and at intermediate points not exceeding 800 feet apart. (See WAC 296-44-058 through 296-44-076 for method.)

(iii) Cable splices. Splices in the cable shall be made so that their insulation is not materially weaker than the remainder of the cable. The sheath or armor at the splice shall be made electrically continuous.

(iv) Cable insulation. The conductors of the cable shall be insulated so as to withstand a factory potential test of at least twice the operating voltage at operating frequency applied continuously for 5 minutes between conductors and between any conductor and the sheath or armor.

(b) Other supply cables. The following requirements apply to all supply cables not included in (a) above.

(i) Messenger. The messenger shall be of corrosion-resistant material, and shall not be stressed beyond 60 percent of its ultimate strength under the loadings specified in WAC 296-44-355.

(ii) Cable. There are no strength requirements for cables supported by messengers.

(8) **Open-wire communication conductors.** Open-wire communication conductors in grade B or C construction shall have the sizes and sags given in subsections (6)(b) and (d) for supply conductors of the same grade.

Exception: Where open-wire communication conductors in spans of 150 feet or less are above supply circuits of 5,000 volts or less between conductors, grade C sizes and sags may be replaced by grade D sizes and sags, except that where the supply conductors are trolley-contact conductors of 0 to 750 volts to ground, No. 12 wire may be used for spans of 0 to 100 feet, and No. 9 steel wire may be used for spans of 125 to 150 feet.

(9) Communication cables.

(a) Metal-sheathed communication cables. There are no strength requirements for such cables supported by messengers.

(b) Messenger. The messenger shall be of corrosion-resistant material, and shall not be stressed beyond 60 percent of its ultimate strength under the loadings specified in WAC 296-44-355.

(10) Paired communication conductors.

(a) Paired conductors supported on messenger.

(i) Use of messenger. A messenger of corrosion-resistant material may be used for supporting paired conductors in any location, but is only required for paired conductors crossing over trolley-contact conductors of more than 7,500 volts to ground.

(ii) Sag of messenger. Messenger used for supporting paired conductors required to meet grade B construction because of crossing over trolley-contact conductors shall meet the sag requirements for grade D messengers.

(iii) Size and sag of conductors. There are no requirements for paired conductors when supported on messenger.

(b) Paired conductors not supported on messenger.

(i) Above supply lines.

Grade B. Sizes and sags shall be not less than those required by subsections (6)(b) and (d) for supply conductors of similar grade.

Grade C. Sizes and sags shall be not less than the following:

Spans 0 to 100 feet. No sag requirements. Each conductor shall be of corrosion-resistant material, and shall have an ultimate strength of not less than 170 pounds.

Spans 100 to 150 feet. Sizes and sags shall be not less than required for grade D communication conductors.

Spans exceeding 150 feet. Sizes and sags shall be not less than required for grade C supply conductors. (See subsection (6)(d).)

(ii) Above trolley-contact conductors.

Grade B. Sizes and sags shall be not less than the following:

Spans 0 to 100 feet. No size requirements. Sags shall be not less than for No. 8 AWG hard-drawn copper. (See subsection (6)(d).)

Spans exceeding 100 feet. Each conductor shall be of corrosion-resistant material, and shall have an ultimate strength of not less than 170 pounds. Sags shall be not less than for No. 8 AWG hard-drawn copper. (See subsection (6)(d).)

Grade C. Sizes and sags shall be as follows:

Spans 0 to 100 feet. No requirements.

Spans exceeding 100 feet. No sag requirements. Each conductor shall be of corrosion-resistant material, and shall have an ultimate strength of not less than 170 pounds.

(11) **Short-span crossing construction.** Where supply lines cross over railways or communication lines by the short-span method the requirements for grade B or C conductor sags and sizes are waived in so far as such grades are required by the crossing, provided that an effectively grounded guard arm is installed at each cross-over support in such a manner as to prevent conductors which break in either adjoining span from swinging back into the conductors crossed over, or in the case of a railroad crossing into the space between the crossing supports.

Note: The short-span method of crossing requires the cross-over span to be of such a height that a conductor breaking in that span cannot come within 15 feet of the ground or rails at a railroad crossing or make contact with any wires crossed over at a wire crossing.

This character of construction is facilitated where the cross-over supports can be placed quite near together and in the case of wire crossings where the span crossed over is at a minimum elevation above ground.

(12) **Cradles at supply-line crossing.** Cradles should not be used.

Note: It is less expensive and better to build the supply line strong enough to withstand extreme conditions than to build a cradle of sufficient strength to catch and hold the supply line if it falls.

(13) **Protective covering or treatment for metal work.** All hardware, including bolts, washers, guys, anchor rods, and similar parts of material, subject to injurious corrosion under the prevailing conditions, shall be protected by galvanizing, painting, or other treatment which will effectively retard corrosion. [§ 26 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-367 Strength requirements—Grade D construction. (1) Poles.

(a) Strength of unguyed poles. Unguyed poles, except as provided in subsection (1)(h), shall withstand the vertical and transverse loads specified in WAC 296-44-358(1) and (2), and the longitudinal loads specified in WAC 296-44-358(3)(d), without exceeding the following percentages of their ultimate stress:

	Percentages of ultimate stress
For transverse loads:	
When installed	25.0
At replacement	37.5
For longitudinal loads:	
When installed	75.0
At replacement	100.0

(b) Strength of guyed poles. Where poles are guyed, the poles shall be considered as acting as struts, resisting the vertical component of the tension in the guy, calculated as in subsection (3), combined with the vertical load.

(c) Strength requirements for poles where guying is required, but can only be installed at a distance. Where on account of physical conditions it is impracticable to guy or brace the crossing poles as specified in subsection (3), the requirements there given may be met by head-guying and side-guying the line as near as practicable to the crossing, but at a distance not exceeding 500 feet from the nearest crossing pole, provided that the line is approximately straight and that a stranded steel wire or other standard strand of strength equivalent to that of the head guy is run between the two guyed poles, being attached to the guyed poles at the point at which the head guys are attached, this wire being securely attached to every pole between the guyed poles.

(d) Pole locations at crossings. Where communication lines cross over railroads, the poles shall be located as follows:

(i) The poles supporting the crossing span and the adjacent spans should be located in a straight line, if practicable. Where the poles supporting the crossing span

and the adjacent spans are not in line, guying shall be placed to take care of the unbalanced load.

(ii) The crossing span shall, where practicable, not exceed 100 feet in the heavy loading district, 125 feet in the medium loading district, and 150 feet in the light loading district.

(e) Freedom from defects. Wood poles shall be of suitable and selected timber free from observable defects that would decrease their strength or durability.

(f) Minimum pole size. Wood poles shall have a nominal circumference of not less than 15 inches.

(g) Spliced and stub-reinforced poles. Spliced poles shall not be used at grade D crossings. At crossings over minor railroad tracks, the use of stub-reinforcements that develop the required strength of the pole is permitted, provided the pole above the ground line is in good condition and is of sufficient size to develop its required strength.

(h) Poles located at crossings over spur tracks. Where a communication line paralleling a railroad track on the right-of-way of the railroad crosses a spur or stub track without any change in the general direction of line, the transverse strength requirements for grade D construction may be met without the use of side guys, provided the pole is not stressed beyond one-third of its ultimate stress. No requirements for longitudinal strength are made if the conductor tensions are balanced. Where conductor tensions are not balanced, due to a small angle in the line at one or both poles, or to dead-ending any of the wires, either guys or braces capable of withstanding such unbalanced tensions shall be installed.

(2) **Pole settings.** Foundations and settings for unguyed poles shall be such as to withstand the loads assumed in WAC 296-44-358(1), (2), and (3).

(3) Guys.

(a) General. The general requirements for guys are covered under "Miscellaneous Requirements" (WAC 296-44-400 through 296-44-427).

(b) Where used. Side guys or braces shall be used on poles supporting the crossing span to withstand the loads put upon them in accordance with the conditions specified in WAC 296-44-358(2). Head guys shall be installed in accordance with Table 23.

Exception 1: Side guys are not required where the crossing poles have the transverse strength specified in section (1)(a) without the reduction for conductor shielding specified in WAC 296-44-358(2)(a) and (2)(b).

Exception 2: Head guys are not required where the crossing poles have the longitudinal strength specified in subsection (1)(a), or where they carry a cable supported on 6,000-pound or stronger messenger.

Exception 3: Where a line crossing a railroad changes direction more than 10 degrees at either crossing support, the side guy within the angle may be omitted and the head guy, if required shall be placed in the direction of the adjacent span unless the angle of turn is greater than 60 degrees.

Exception 4: Guying may be omitted where communication lines cross over spur or stub tracks as provided in subsection (1)(h).

Exception 5: This rule does not apply to crossing poles under the special conditions set forth in subsection (1)(c).

TABLE 23.—Strength (in pounds) of head guys required for loading districts indicated.¹
(Combinations of standard-size guys may be used)

Number of wires	Ratio of guy lead to height not less than—				
	1 1/4	1	3/4	2/3	1/2
HEAVY LOADING					
2	4,000	4,000	4,000	4,000	4,000
6	4,000	4,000	4,000	4,000	6,000
10	6,000	6,000	6,000	10,000	10,000
20	10,000	10,000	12,000	16,000	16,000
30	16,000	16,000	20,000	20,000	26,000
40	20,000	20,000	26,000	26,000	32,000
50	20,000	20,000	30,000	32,000	42,000
60	26,000	30,000	36,000	36,000	48,000
70	30,000	30,000	40,000	48,000	60,000
80	36,000	40,000	48,000	60,000	70,000
MEDIUM LOADING					
2	4,000	4,000	4,000	4,000	4,000
6	4,000	4,000	4,000	4,000	4,000
10	4,000	4,000	6,000	6,000	6,000
20	6,000	10,000	10,000	10,000	12,000
30	10,000	10,000	12,000	16,000	16,000
40	12,000	16,000	16,000	16,000	20,000
50	16,000	16,000	20,000	20,000	26,000
60	20,000	20,000	26,000	26,000	30,000
70	20,000	20,000	26,000	30,000	36,000
80	26,000	26,000	30,000	32,000	40,000
LIGHT LOADING					
2	4,000	4,000	4,000	4,000	4,000
6	4,000	4,000	4,000	4,000	4,000
10	4,000	4,000	4,000	4,000	4,000
20	4,000	6,000	6,000	6,000	10,000
30	6,000	10,000	10,000	10,000	12,000
40	10,000	10,000	10,000	12,000	16,000
50	10,000	10,000	16,000	16,000	20,000
60	12,000	16,000	16,000	16,000	20,000
70	16,000	16,000	20,000	20,000	26,000
80	16,000	20,000	20,000	26,000	30,000

¹This table is based on ultimate or breaking strength of guys equal to seven-sixths of the nominal strengths shown in the table and a wire

load of 50 percent No. 8 BWG iron and 50 percent No. 9 AWG copper with an average pull of 408.75 pounds per wire.
No guy will be required for cable, since the messenger serves as a head guy.

(c) Guys used for transverse strength. Side guys used in straight sections of line shall be considered as taking the entire load in the direction in which they act, without exceeding 37.5 percent of their ultimate strength.

(d) Guys used for longitudinal strength.

(i) Direction of head guys. Where head guys are required, they shall be installed in the direction away from the crossing.

(ii) Size and number of head guys. Guys, if required for various open-wire loads, shall be in accordance with Table 23.

(e) Maintenance. Guys and anchors shall be maintained so that the guys carry the load.

(4) Crossarms.

(a) Material. Wood crossarms supporting the crossing span shall be of yellow pine, fir, or other suitable timber.

(b) Minimum size.

(i) Wood crossarms. Wood crossarms shall have a cross section not less than the following:

	Nominal length		Nominal cross section (Inches)
	Feet	Inches	
2	1	4 1/2	2 5/16 by 3 5/16
4	3	4 1/2	2 5/16 by 3 5/16
6	0	0	2 3/4 by 3 3/4
10	8	6	2 3/4 by 3 3/4
10	10	0	3 by 4
12 ¹	10	0	3 1/4 by 4 1/4
16 ²	10	0	3 1/4 by 4 1/4

¹Where crossarms are bored for 1/2-inch steel pins, 3-inch by 4 1/4-inch crossarms may be used.

²Permitted in medium and light loading districts only.

(ii) Steel or iron crossarms. Galvanized or painted iron or steel crossarms of strength equal to wood crossarms may be used.

(c) Double crossarms. Crossarms and insulators shall be double on the crossing poles. The crossarms shall be held together with properly fitted spacing blocks or bolts placed immediately adjoining the outside pins. Spacing blocks or spacing bolts are not required for two-pin crossarms.

(5) **Brackets and racks.** Wood brackets may be used only if used in duplicate or otherwise designed so as to afford two points of support for each conductor. Single metal brackets, racks, drive hooks or other fixtures may be used if designed and attached in such manner as to withstand the full dead-end pull of the wires supported.

(6) Pins.

(a) Material. Insulator pins shall be of steel, wrought iron, malleable cast iron, or locust or equivalent wood.

(b) Strength. Insulator pins shall have sufficient strength to withstand the loads to which they may be subjected.

(c) Size.

(i) Wood pins. Wood pins shall be sound and straight-grained with a diameter of shank not less than 1 1/4 inches.

(ii) Metal pins. Steel or iron pins shall have diameter of shank not less than 1/2 inch.

(7) **Insulators.** Each insulator shall be of such pattern, design, and material that when mounted it will withstand without injury and without being pulled off the pin, the ultimate strength of the conductor attached to the insulator.

(8) **Attachment of conductor to insulator.** The conductor shall be securely tied to each supporting insulator.

(9) **Conductors.**

(a) Material. Conductors shall be of material or combinations of materials which will not corrode excessively under the prevailing conditions.

(b) Size. Conductors of the crossing span, if of hard-drawn copper or galvanized steel, shall have sizes not less than specified in (i) and (ii) below. Conductors of material other than the above shall be of such size and so strung as to have a mechanical strength not less than that of the sizes of copper conductors given in (i) and (ii) below.

(i) Spans not exceeding 150 feet. The sizes in Table 24 apply for all loading districts.

TABLE 24.—Minimum wire sizes

(AWG for copper; Stl. WG for steel)

Conductor	Spans of 125 feet or less	Spans 125 to 150 feet
Copper, hard-drawn	10	9
Steel, galvanized:		
In general	10	8
In rural districts of arid regions	12	10

(ii) Spans exceeding 150 feet. If spans in excess of 150 feet are necessary, the size of conductors specified above or the sags of the conductors shall be correspondingly increased.

(c) Paired conductors without messengers. Paired wires without a supporting messenger shall be eliminated as far as practicable and where used shall meet the following requirements:

(i) Material and strength. Each conductor shall be of material which will not corrode excessively under the prevailing conditions and shall have an ultimate strength of not less than 170 pounds.

(ii) Limiting span lengths. Paired wires shall in no case be used without a supporting messenger in spans longer than 100 feet in the heavy loading district, 125 feet in the medium loading district, and 150 feet in the light loading district.

(d) Sags. Table 25 specifies the recommended sags for wires shown in Table 24.

**TABLE 25.—Stringing sags
HEAVY AND MEDIUM LOADING DISTRICTS**

Length of span	100°F	80°F	60°F	40°F	20°F	0°F
	in.	in.	in.	in.	in.	in.
70	5.7	4.4	3.4	2.7	2.2	1.8
75	6.4	5.1	4.0	3.1	2.5	2.1
80	7.4	5.8	4.5	3.5	2.9	2.4
85	8.4	6.6	5.1	4.0	3.2	2.7
90	9.4	7.3	5.7	4.5	3.6	3.0
95	10.0	8.2	6.3	5.0	4.0	3.4
100	11.6	9.0	7.0	5.5	4.5	3.7
110	14.0	11.0	8.5	6.7	5.4	4.5
120	16.6	13.0	10.1	7.9	6.4	5.4
130	19.5	15.3	11.8	9.3	7.6	6.3
140	22.6	17.7	13.7	10.8	8.8	7.3
150	26.0	20.3	15.8	12.4	10.1	8.4

LIGHT LOADING DISTRICT

Length of span	110°F	100°F	80°F	60°F	40°F	20°F	10°F
	in.	in.	in.	in.	in.	in.	in.
80	5.5	5.0	4.2	3.4	2.8	2.4	2.2
85	6.2	5.7	4.7	3.9	3.2	2.7	2.5
90	7.0	6.4	5.3	4.3	3.6	3.0	2.8
95	7.8	7.1	5.8	4.8	4.0	3.4	3.1
100	8.6	7.9	6.5	5.3	4.4	3.7	3.5
110	10.4	9.5	7.8	6.5	5.4	4.5	4.2
120	12.4	11.3	9.3	7.7	6.4	5.4	5.0
130	14.6	13.3	11.0	9.0	7.5	6.3	5.9
140	16.9	15.4	12.7	10.5	8.7	7.3	6.8
150	19.4	17.7	14.6	12.0	10.0	8.4	7.8

(e) Splices and taps. Splices shall as far as practicable be avoided in the crossing and adjacent spans. If it is impracticable to avoid such splices, they shall be of such a type and so made as to have a strength substantially equal to that of the conductor in which they are placed.

Taps shall be avoided in the crossing span where practicable, but if required shall be of a type which will not impair the strength of the conductors to which they are attached.

(10) **Messengers.**

(a) Minimum size.

(i) Spans not exceeding 150 feet. Table 26 gives the minimum sizes of galvanized steel-strand messenger to be used for supporting different sizes of cables:

TABLE 26.—Minimum sizes of messenger

Size of cable in weight per foot	Messenger (nominal breaking load)
	Pounds
Less than 2.25 pounds	6,000
2.25 to 5 pounds	10,000
Exceeding 5 and less than 8.5 pounds	16,000

(ii) Spans exceeding 150 feet. For spans exceeding 150 feet or for heavier cables a proportionately larger messenger or other proportionately stronger means of support shall be used.

(b) Sags and tensions. Multiple-conductor cables and their messengers shall be so suspended that when they are subjected to the loading prescribed in WAC 296-44-355, the tension in the messenger will not exceed 60 percent of its ultimate strength.

(11) **Inspection.** (See WAC 296-44-286.) [§ 26 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-370 Strength requirements—Grade N construction. (1) **Poles and towers.** Poles used for lines for which neither grade B, C or D is required shall be of such initial size and so guyed or braced, where necessary, as to withstand safely the loads to which they may be subjected, including linemen working on them. Such poles and stubs on state and federal highways shall be located as far as practicable from the traveled portion of such highways. The number of crossings over such highways should be kept to a minimum. Such poles and stubs located within falling distance of the traveled portion of such highways, or so located that their failure would permit wires, cables, guys, or other equipment to fall into the traveled portion of the highway, or would reduce the clearances specified in Table 1 over the traveled portion of such highways, shall be periodically inspected and maintained in safe condition.

(2) **Guys.** The general requirements for guys are covered under "Miscellaneous Requirements" (WAC 296-44-400 through 296-44-427).

(3) **Crossarm strength.** Crossarms shall be securely supported, by bracing if necessary, so as to support safety loads to which they may be subjected in use, including linemen working on them. Any crossarm, or buckarm, shall be capable of supporting a vertical load of 225 pounds at either extremity, in addition to the weight of the conductors.

Note: Double crossarms are generally used at crossings, unbalanced corners, and dead-ends, in order to permit conductor fastenings at two insulators, and so prevent slipping, although single crossarms might provide sufficient strength. To secure extra strength, double crossarms are frequently used, and crossarm guys are sometimes used.

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(4) **Supply-line conductors.**

(a) **Material.** All supply-line conductors shall be of material or combinations of materials which will not corrode excessively under the prevailing conditions.

(b) **Size.** Supply-line conductors shall be not smaller than the following:

TABLE 27.—Grade N minimum sizes for supply-line conductors

(AWG for copper and aluminum; Stl. WG for steel)

	Urban	Rural
Soft copper	6	8
Medium or hard-drawn copper	8	8
Steel	9	9

	Urban and rural	
	Spans 150 feet or less	Spans exceeding 150 feet
Stranded aluminum:		
Not reinforced	1	0
Steel-reinforced	6	4

Recommendation: It is recommended that, except as modified in WAC 296-44-364(6)(b), these minimum sizes for copper and steel not to be used in spans longer than 150 feet for the heavy-loading district, and 175 feet for the medium and light-loading districts.

(5) **Supply services.**

(a) **Material.** All supply service conductors shall be of material or combinations of materials which will not corrode excessively under the prevailing conditions.

(b) **Size of open-wire services.**

(i) Not over 750 volts between conductors. Supply-service leads of not over 750 volts between conductors shall be not smaller than required by (A) or (B) below:

(A) Spans not exceeding 150 feet. Sizes shall be not smaller than specified in Table 28.

TABLE 28.—Minimum sizes of service leads carrying 750 volts or less

(All voltages are between conductors except trolley-contact conductors where voltages are to ground)

(AWG for copper; Stl. WG for steel)

Situation	Copper wire		Steel wire
	Soft-drawn	Medium or hard-drawn	
Alone	10	12	12
Concerned with communication conductors	10	12	12
Over supply conductors of—			
0 to 750 volts	10	12	12
750 to 8,700 volts ¹	8	10	12
Exceeding 8,700 volts ¹	6	8	9

Situation	Copper wire		Steel wire
	Soft-drawn	Medium or hard-drawn	
Over trolley-contact conductors—			
0 to 750 volts ac or dc	8	10	12
Exceeding 750 volts ac or dc	6	8	9

¹Installation of service leads of not more than 750 volts above supply lines of more than 750 volts should be avoided where practicable.

(B) Spans exceeding 150 feet. Sizes shall be not smaller than required for Grade C. (WAC 296-44-364(6)(b)).

(ii) Exceeding 750 volts between conductors. Sizes of supply-service leads of more than 750 volts between conductors shall be not less than required for supply-line conductors of the same voltage.

(c) Sag, open-wire services.

(i) Not over 750 volts between conductors. Supply service leads of not over 750 volts between conductors shall have sags not less than shown in Table 29.

TABLE 29.—Sags for open-wire services

Span lengths	Sag
Feet	Inches
100 or less	12.
100 to 125	18.
125 to 150	27.
Exceeding 150	Grade C sags.

(ii) Exceeding 750 volts between conductors. Supply service leads of more than 750 volts between conductors shall comply as to sags with the requirements for supply line conductors of the same voltage.

(d) Cabled services. Supply service leads may be grouped together in a cable, provided the following requirements are met:

(i) Size. The size of each conductor shall be not less than required for leads of separate conductors (subsection (5)(b).)

(ii) Sag. The sag of the cable should be not less than required for leads of separate conductors (subsection (5)(c).)

(iii) Insulation. The insulation should be sufficient to withstand twice the normal operating voltage.

(6) **Lightning-protection wires.** Lightning-protection wires paralleling the line conductors shall be regarded, in respect to size and material requirements, as supply conductors.

(7) **Trolley-contact conductors.** In order to provide for wear, no trolley-contact conductors shall be installed of less size than No. 0, if of copper, or No. 4, if of silicon bronze.

(8) **Cradles at supply-line crossing.** Cradles should not be used.

Note: It is less expensive and better to build the supply line strong enough to withstand extreme conditions

than to build a cradle of sufficient strength to catch and hold the supply line if it falls.

(9) **Communication conductors.** There are no specific requirements for grade N communication line conductors or service drops. [§ 26 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-373 Line insulators—Application of rule. These requirements apply only to supply lines in situations where grade B construction is required. (See WAC 296-44-346(5), for insulation requirements for neutral conductors.) [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-376 Line insulators—Material and marking. Insulators for operation on supply circuits at voltages of 2,300 and above shall be of porcelain, made by the wet process or one equally suitable as regards electrical and mechanical properties, or other material which will give equally good results in respect to mechanical and electrical performance and durability. They should be marked by the maker with his name, trademark, or identification number so applied as not to reduce the electrical or mechanical strength of the insulator. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-379 Line insulators—Electrical strength of insulators in strain position. Where insulators are used in a strain position they shall have not less electrical strength than the insulators generally used on the line when under the normal mechanical stresses imposed by the loadings specified in WAC 296-44-352 through 296-44-358. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-382 Line insulators—Ratio of flash-over to puncture voltage. Insulators shall be designed so that their dry flash-over voltage is not more than 75 percent of their puncture voltage at a frequency of 60 cycles per second. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-385 Line insulators—Test voltages. Insulators when tested under the current specifications of the American Standard Association shall not flash over at values less than given in Table 30.

TABLE 30.—Test-voltage requirements

(For application see rules 275 and 278)

Nominal voltage between conductors	Minimum test dry flash-over voltage of insulators	Nominal voltage between conductors	Minimum test dry flash-over voltage of insulators
750	5,000	46,000	125,000
2,400	20,000	69,000	175,000
7,200	40,000	115,000	315,000
13,200	55,000	138,000	390,000
23,000	75,000	161,000	445,000
34,500	100,000	230,000	640,000

(Interpolate for intermediate values.)

[§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-388 Line insulators—Factory tests. Each insulator or insulating part thereof for use on circuits operating at voltages in excess of 15,000 volts shall be subjected to a routine dry flash-over test at the factory for a period of 3 minutes at a frequency of 60 cycles per second or to any other test sanctioned by good modern practice, such as high-frequency tests. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-391 Line insulators—Selection of insulators. (1) **Insulators for constant-current circuits.** Insulators for use on constant-current circuits shall be determined on the basis of the nominal full-load voltage of the circuit.

(2) **Insulators for single-phase circuits directly connected to three-phase circuits.** Insulators used on single-phase circuits directly connected to three-phase circuits (without intervening isolating transformers) shall have a flash-over voltage not less than that required for the insulators on the three-phase circuits.

(3) **Insulators for nominal voltages between conductors.** In selecting insulators of the test voltage to be used for any nominal voltage between conductors, consideration shall be given to the conditions under which the line will operate as follows:

(a) Where the system is of moderate extent, in open country, subject to intermittent rains and moderate lightning, insulators having flash-over values not less than given in Table 30 shall be used.

(b) Where operating conditions are more severe than set forth in (a) above, due to extent of system, prevalence of exceptionally severe lightning, bad atmospheric conditions (caused by chemical fumes, smoke, cement dust, salt fog, or other foreign matter), or to a long, dry season with heavy dust accumulation followed by moisture, insulators having a higher flash-over than given in Table 30 or other equally effective means of increasing insulation shall be used. The increase is to be determined by local conditions and experience. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-394 Line insulators—Protection against arcing. In installing the insulators and conductors, such precautions as are sanctioned by good modern practice shall be taken to prevent, as far as possible any arc from forming or to prevent any arc which might be formed from injuring or burning any parts of the supporting structures, insulators or conductors which might render the conductors liable to fall. [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-397 Line insulators—Compliance with WAC 296-44-394 at crossings. Construction in accordance with any one of the methods ((1) to (7)) given below will be considered as a means of meeting the requirements of WAC 296-44-394 above, provided that insulators having a flash-over not less than required by WAC 296-44-391(3)(a) or (3)(b) are used, and in no case having a lower flash-over than insulators generally used in adjacent sections of the line.

Exception: If the insulator hardware on the structure is grounded at crossings and is not grounded on the adjacent parts of the line, construction in accordance with (1) or (2) below should be followed, or other equally effective means employed.

The use of grounded construction at crossings only should in general be avoided.

(1) The use of a protective device such as a gap, protector tube, lightning arrester, or the like, on or adjacent to the insulator, which is effective in suppressing the power arc or in holding it clear of the insulator, conductor, supporting structure, and hardware.

(2) The use of protective gaps or other voltage-limiting devices on structures adjacent to crossing structures, if such devices limit the voltage to not more than 80 percent of the flash-over value of the insulators on the crossing structures.

(3) The use of circuit protection by fast-clearing fuses or circuit-breakers. Fuses, or breakers in combination with their relays, shall be considered "fast-clearing" if they interrupt fault currents within one-fifth second (12 cycles at 60 cycles per second).

(4) The use of one or more overhead ground wires installed at a higher level than the phase wires on not less than five consecutive spans, including two adjacent spans on each side of the crossing span, provided the ground wire is effectively grounded at structures adjacent to crossing structures.

Such overhead ground wires shall not be grounded at crossing structures unless such structures are inherently grounded or unless the ground wires are grounded at each of the two supporting structures on both sides of and adjacent to the crossing structures. In this latter case the down leads from the overhead ground wires shall be suitably offset from the crossing structures or otherwise arranged so as not to appreciably increase the probability of lightning flash-over from the overhead ground wire and its connections to the phase wires and other current-carrying parts.

(5) The use of insulators with ungrounded pins or supporting insulator attachments carried on wood arms.

(6) The use of insulators having a flash-over 25 percent greater than those employed on adjacent sections of the line, but not less than 25 percent greater than the values in Table 30.

(7) If the insulator supports on the crossing structure and on adjacent sections of the line are grounded, the use of insulator strings with higher flash-over voltage at crossing supports than on the adjacent sections, as follows:

(a) If the adjacent parts of the line have five or less units—one extra unit at the crossing.

(b) If the adjacent parts of the line have six or more units—two extra units at the crossing.

(c) Insulation equivalent to that provided by (a) or (b). [§ 27 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-400 Miscellaneous requirements—Supporting structures for overhead lines. (1) **Poles and towers.**

(a) Rubbish. Poles and towers shall be placed, guarded, and maintained so as to be exposed as little as practicable to brush, grass, rubbish, or building fires.

(b) Guarding poles.

(i) Protection against mechanical injury. Where poles and towers are exposed to abrasion by traffic or to other damage which would materially affect their strength, they shall be protected by guards.

(ii) Protection against climbing. On closely latticed poles or towers carrying supply conductors exceeding 300 volts to ground, either guards or warning signs shall be used, except as follows:

Exception 1: Where the right-of-way is completely fenced.

Exception 2: Where the right-of-way is not completely fenced, provided the poles or towers are not adjacent to roads, regularly traveled thoroughfares, or places where people frequently gather, such as schools or public playgrounds.

(c) Warning signs.

(i) On poles or towers. For warning signs on poles or towers, see subsection (1)(b)(ii).

(ii) On bridge fixtures. Structures attached to bridges for the purpose of supporting conductors shall be plainly marked with the name, initials, or trade-mark of the utility responsible for the attachment and, in addition, where the voltage exceeds 750 volts to ground, by the following sign or its equivalent:

"Danger—Do Not Touch."

(d) Pole steps. All poles along which shall be run vertically any wire or cable used to conduct or carry a voltage of over two hundred fifty volts may be provided with steps, and no steps shall be placed nearer the ground than seven feet.

(e) Identification of poles. Poles, towers and other supporting structures on which are maintained electric conductors shall be so constructed, located, marked, or numbered as to facilitate identification by employees authorized to work thereon. Date of installation of such structures shall be recorded where practicable by the owner.

Wood poles shall bear markings by which the depth of setting can be determined.

(f) Obstructions. All poles should be kept free from posters, bills, tacks, nails, growing vines, and other unnecessary obstructions, such as through bolts not properly trimmed. [See Figure 11 in Appendix.]

(2) **Crossarms.**

(a) Location. In general crossarms should be maintained at right angles to the axis of the pole and to the direction of the attached conductors, and at crossings should be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used.

Note: Double crossarms are generally used at crossings, unbalanced corners, and dead-ends in order to permit conductor fastenings at two insulators and so prevent slipping, although single crossarms might provide sufficient strength. To secure extra strength, double

crossarms are frequently used and crossarm guys are sometimes used.

(b) Bracing. Crossarms shall be securely supported, by bracing if necessary, so as to support safely loads to which they may be subjected, including linemen working on them. Any crossarm or buckarm shall be capable of supporting a vertical load of 225 pounds at either extremity in addition to the weight of the conductors.

This rule shall not apply to the top crossarm on poles used solely for communication circuits. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-403 Miscellaneous requirements—

Tree trimming. (1) **General.** Where trees exist near supply-line conductors, they shall be trimmed, if practicable, so the neither the movement of the trees nor the swinging or increased sagging of conductors in wind or ice storms or at high temperatures will bring about contact between the conductors and the trees.

Exception: For the lower-voltage conductors, where trimming is difficult, the conductor may be protected against abrasion and against grounding through the tree by interposing between it and the tree a sufficiently nonabsorptive and substantial insulating material or device.

(2) **At wire crossings and railroad crossings.** The crossing span and the next adjoining spans shall be kept free, as far as practicable, from overhanging or decayed trees which might fall into the line. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-406 Miscellaneous requirements—

Guying. (1) **Where used.** When the loads to be imposed on poles, towers, or other supporting structures are greater than can be safely supported by the poles or towers alone, additional strength shall be provided by the use of guys, braces or other adequate construction.

Guys shall be used also, where necessary, wherever conductor tensions are not balanced, as at corners, angles, dead-ends, and changes of grade of construction.

Note: This is to prevent undue increase of sags in adjacent spans as well as to provide sufficient strength for those supports on which the loads are considerably unbalanced.

(2) **Strength.** The strength of the guy shall meet the requirements of WAC 296-44-361 through 296-44-367 for the grade of construction that applies.

When guys are used with wood or other poles or towers capable of considerable deflection before failure, the guys shall be able to support the entire load in the direction in which they act, the pole acting simply as a strut.

(3) **Point of attachment.** The guy should be attached to the structure as near as practicable to the center of the conductor load to be sustained, but for voltages exceeding 8,700 volts between conductors, the insulation afforded by wood crossarms and poles should not be reduced any more than is necessary.

(4) **Guy fastenings.** Guys should be stranded and where attached to anchor rods should be protected by

suitable guy thimbles or their equivalent. Cedar and other softwood poles around which any guy having a strength of 10,000 pounds or more is wrapped should be protected by the use of suitable guy shims and, where there is a tendency for the guy to slip off the shim, guy hooks or other suitable means of preventing this action should be used. Shims are not necessary in the case of supplementary guys, such as storm guys.

(5) **Guy guards.** The ground end of all guys attached to ground anchors exposed to traffic shall be provided with a substantial and conspicuous wood or metal guard not less than 8 feet long.

Recommendation: It is recommended that in exposed or poorly lighted locations such guards be painted white or some other conspicuous color.

(6) **Insulating guys from metal poles.** Where anchors would otherwise be subject to electrolysis, guys attached to metal poles or structures and not containing guy insulators should be insulated from the metal pole or structure by suitable blocking.

(7) **Anchor rods.** Anchor rods shall be installed so as to be in line with the pull of the attached guy when under load, except in rock or concrete. The anchor rod shall have an ultimate strength in the eye and shank equal to that required of the guy.

The anchor rod eye shall extend above ground when installed.

(8) **Grounding.** The anchored end of guys attached to wood poles carrying circuits of more than 15,000 volts shall be effectively grounded (see section 9 for method) wherever this part of the guy has a clearance of less than 8 feet to ground.

Exception 1: This does not apply to guys in rural districts.

Exception 2: This does not apply if the guy contains an insulator which will meet the requirements of WAC 296-44-409(1)(b) for the highest voltage liable to be impressed on it. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

**WAC 296-44-409 Miscellaneous requirements—
Insulators in guys attached to poles and towers. (1)
Properties of guy insulators.**

(a) Material.

(i) **Grade B.** Guy insulators shall be made by the wet-porcelain process or a process equally suitable as regards electrical and mechanical properties.

(ii) **Grade C, D, and N.** No requirements are made for material.

(b) Electrical strength. Guy insulators shall have a dry flash-over voltage at least double the normal voltage and a wet flash-over voltage at least as high as the normal line voltage between conductors.

(c) Mechanical strength. Guy insulators shall have a mechanical strength at least equal to that required of the guys in which they are installed.

(2) **Use of guy insulators.**

(a) One insulator. An insulator shall be located in each guy which is attached to a pole or structure carrying any supply conductors of more than 300 volts to

ground and not more than 15,000 volts between conductors, or in any guy which is exposed to such voltages. This guy insulator shall be located at least 8 feet above the ground.

Exception 1: A guy insulator is not required where the guy is grounded under the conditions set forth in (d) following.

Exception 2: A guy insulator is not required if the guy is attached to a pole on private right-of-way carrying no supply circuits whose voltage exceeds 550 volts or whose transmitted power exceeds 3,200 watts.

Exception 3: A guy insulator is not required if all supply conductors are in a cable having a grounded metal sheath or supported by a grounded messenger.

(b) Two insulators. Where a guy attached to any pole carrying communication or supply conductors or both, is carried over or under any overhead supply conductor of more than 300 volts to ground and where hazard would otherwise exist, two or more guy insulators shall be placed so as to include the exposed section of the guy between them as far as possible. Neither insulator shall be within 8 feet of the ground.

Exception: These insulators are not required where the guy is grounded under the conditions set forth in (d) following.

(c) Relative location of insulators in guys located one above the other. Where guys in which it is necessary to install insulators are so arranged that one crosses or is above another, insulators shall be so placed that in case any guy sags down upon another the insulators will not become ineffective.

(d) Grounding of guys. Insulators are not required in guys under the following conditions:

(i) Where the guy is electrically connected to grounded steel structures.

(ii) Where the guy is electrically connected to an effectively grounded line conductor which is a common or multi-grounded neutral for supply lines over 5000 volts, and lines of 750 to 5000 volts are not carried on the same pole or structure.

(iii) Where the guy is effectively grounded and used solely for support of communication lines.

(iv) Where the anchor guy is attached to a pole on private right-of-way carrying no supply circuits whose voltage exceeds 550 volts. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

**WAC 296-44-412 Miscellaneous requirements—
Span-wire insulators. (1) Mechanical strength.** Span-wire insulators shall have a mechanical strength at least equal to that required of the span wire in which they are installed.

(2) **Use of span-wire insulators.** All span wires, including bracket span wires, shall have a suitable strain insulator (in addition to an insulated hanger if used) inserted between each point of support of the span wire and the lamp or trolley-contact conductor supported, except that single insulation, as provided by an insulated hanger, may be permitted when the span wire or bracket

is supported on wood poles supporting only trolley, railway feeder, or communication conductors used in the operation of the railway concerned. In case insulated hangers are not used, the strain insulator shall be located so that in the event of a broken span wire the energized part of the spanwire cannot be reached from the ground.

Exception: This rule does not apply to insulated feeder taps used as span wires. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-415 Miscellaneous requirements—Overhead conductors. (1) **Identification.** All conductors of electric-supply and communication lines shall be arranged to occupy definite positions throughout, as far as practicable, and shall be constructed, located, marked, numbered, or attached to distinctive insulators or cross-arms, so as to facilitate identification by employees authorized to work thereon. This does not prohibit systematic transposition of conductors.

(2) **Branch connections.**

(a) **Accessibility.** Connections of branches to supply circuits, service loops, and equipment in overhead construction shall be readily accessible to authorized employees. When possible, connections shall be made at poles or other structures.

(b) **Clearance.** Branch connections shall be supported and placed so that swinging or sagging cannot bring them in contact with other conductors or interfere with the safe use of pole steps, or reduce the climbing or lateral working space.

(3) **Common neutral.** Primary and secondary circuits may utilize a single conductor as a common neutral if such conductor has at least four ground connections in each mile of line, exclusive of individual service grounds. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-418 Miscellaneous requirements—Equipment on poles. (1) **Identification.** All equipment of electric-supply and communication lines shall be arranged to occupy definite positions throughout, as far as practicable, or shall be constructed, located, marked, or numbered so as to facilitate identification by employees authorized to work thereon.

(2) **Location.** Transformers, regulators, lightning arresters, and switches, when located below conductors or other attachments, shall be mounted outside of the climbing space.

(3) **Street lighting equipment.**

(a) **Clearances from pole surface.** All exposed metal parts of lamps and their supports, unless effectively insulated from the current-carrying parts, shall be maintained not less than 20 inches from the surface of wood poles, except where lamps are located at pole tops.

(b) **Clearances above ground.** Street lamps shall be mounted not less than the following heights above ground:

- over walkways 10 feet
- over roadways 15 feet

(c) **Horizontal clearance.** Arc and incandescent lamps in series circuits should have at least 3 feet horizontal

clearance from windows, porches, and other spaces accessible to the general public.

(d) **Material of suspension.** The lowering rope or chain for lighting units arranged to be lowered for examination or maintenance shall be of a material and strength designed to withstand climatic conditions and to sustain the lighting unit safely. The lowering rope or chain, its supports, and fastenings shall be examined periodically.

(e) **Insulators in suspension ropes.** When street lamps are supported by span wires, such metallic ropes or chains shall be so arranged so that they do not establish a metallic conducting path around the span wire sectionalizing insulators.

(f) **Arc-lamp disconnectors.** A suitable device shall be provided by which each arc-lighting unit on series circuits of more than 300 volts to ground may be safely and entirely disconnected from the circuit before the lamp is handled, unless the lamps are always worked on from suitable insulating stools, platforms, or tower wagons, or handled with suitable insulating tools, and treated as under full voltage of the circuit concerned.

(g) **Grounding lamp posts.** Metal lamp posts shall be effectively grounded.

(4) **Transformers.**

(a) **Position on poles.**

(i) Transformers installed on poles or other structures shall be placed so as to provide adequate climbing and working space.

(ii) Cases and tanks of transformers supported on arms or poles, except on multiple pole rack construction, shall be not less than 17 feet above the ground in areas accessible to vehicles and not less than 10 feet above ground in other areas.

(iii) Where practicable, transformers shall be mounted between primary and secondary supply conductors connected to the transformer and secondary wires may pass along the side of the transformer tank below the level of the primary leads.

(iv) Transformers should not be installed on supply line junction or corner poles which require primary buckarm construction.

(b) **Grounding.**

(i) The neutral conductor of all single phase, two phase or three phase transformer secondary windings, shall be grounded where the maximum voltage between the ground and any secondary circuit conductor will not exceed 150 volts. Where the maximum voltage between the ground and any secondary circuit conductor will, when one secondary conductor is grounded, exceed 150 volts to ground, grounding shall be permitted.

(ii) Transformer secondary ground connections shall be provided at the transformer pole or at a pole adjacent to the transformer pole or shall be connected to an effectively grounded neutral.

(c) **Cutouts and disconnecting devices.** Transformer cutouts, fuses, disconnects or switches shall be located so that they are readily operable from climbing and working spaces. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-421 Miscellaneous requirements—
Protection for exposed overhead communication lines. (1) **Open wire.** Communication lines for public use and fire-alarm lines shall be treated as follows, if at any point they are exposed to supply (including trolley) lines of more than 400 volts to ground:

(a) At stations for public use they shall be protected by one of the methods specified in WAC 296-44-661 through 296-44-667.

(b) Elsewhere they shall be isolated by elevation or otherwise guarded so as to be inaccessible to the public.

(2) **Metal-sheathed cables.** Metal-sheathed cables and messengers shall be isolated or grounded in conformity with the general requirements of WAC 296-44-277 through 296-44-295. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-424 Miscellaneous requirements—
Circuits of one class used exclusively in the operation of circuits of another class. (1) Overhead communication circuits used exclusively in the operation of supply circuits.

(a) Choice of method. Communication circuits used exclusively in the operation of supply lines may be run either as ordinary communication circuits or as supply circuits under the conditions specified in (c) and (d) of this rule, respectively. After selection of the type of communication-circuit construction and protection for any section which is isolated, or is separated by transformers, such construction and protection shall be consistently adhered to throughout the extent of such isolated section of the communication system.

(b) Guarding. Communication circuits used in the operation of supply lines shall be isolated by elevation or otherwise guarded at all points so as to be inaccessible to the public.

(c) Where ordinary communication-line construction may be used. Communication circuits used in the operation of supply lines may be run as ordinary communication conductors under the following conditions:

(i) Where such circuits are below supply conductors in the operation of which they are used (including high-voltage trolley feeders) at crossings, conflicts, or on commonly used poles, provided:

(A) Such communication circuits occupy a position below all other conductors or equipment at crossings, conflicts, or on commonly used poles.

(B) Such communication circuits and their connected equipment are adequately guarded and are accessible only to authorized persons.

(ii) Where such circuits are below supply conductors in the operation of which they are used and are above other supply or communication conductors at wire crossings, conflicts, or on the same poles, provided the communication circuits are protected by fuseless lightning arresters, drainage coils, or other suitable devices to prevent the communication circuit voltage from normally exceeding 400 volts to ground.

Note: The grades of construction for communication conductors with inverted levels apply.

(d) Where supply-line construction must be used. Communication circuits used in the operation of supply lines shall comply with all requirements for the supply lines with which they are used, where they do not comply with the provisos of subsections (c)(i) or (c)(ii) above.

Exception 1: If the voltage of the supply conductors concerned excess 8,700 volts between conductors, the communication conductors, need only meet the requirements for supply conductors of 5,000 to 8,700 volts between conductors.

Exception 2: Where the supply conductors are required to meet grade C, the size of the communication conductors may be the same as for grade D (see WAC 296-44-367(9)(b)) for spans up to 150 feet.

(2) **Supply circuits used exclusively in the operation of communication circuits.** (See also WAC 296-44-430 through 296-44-457.) Circuits used for supplying power solely to apparatus forming part of a communication system may be run either in open wire or in aerial or underground cable as follows:

(a) Where run in open wire, such circuits shall have the grades of construction, clearances, insulation, etc., prescribed elsewhere in WAC 296-44-274 through 296-44-457 for supply or communication circuits of the voltage concerned.

(b) Where run in aerial or underground cable and the following requirements are met, the grades of construction, clearances, separations, locations, etc., prescribed elsewhere in WAC 296-44-274 through 296-44-457 for communication cables shall apply:

(i) Such cables are covered with effectively grounded continuous metal sheaths or are carried in metal cable rings on effectively grounded messengers.

(ii) All circuits in such cables are owned or operated by one party and are maintained only by qualified employees.

(iii) Supply circuits included in such cables are terminated at points accessible only to qualified employees.

(iv) Communication circuits brought out of such a cable, if they do not terminate in a repeater station or terminal office, shall be so protected or arranged that in the event of a failure within the cable, the voltage on these communication circuits will not exceed 400 volts to ground.

(v) Terminal apparatus for the power supply shall be arranged so that live parts are inaccessible when such supply circuits are energized. [See Fig. 11.A, in Appendix at end of this chapter.]

Exception: The provisions of (2)(a) and (2)(b) above, do not apply to supply circuits of 550 volts or less and which carry power not in excess of 3,200 watts, covered in WAC 296-44-298(2)(c). [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-427 Miscellaneous requirements—
Overhead electric railway construction. (1) **Trolley-contact conductor supports.** All overhead trolley-contact conductors shall be supported and arranged so that the breaking of a single contact conductor fastening will not

allow the trolley conductor, live span wire, or current-carrying connection to come within 10 feet (measured vertically) from the ground, or from any platform accessible to the general public.

Span-wire insulation for trolley-contact conductors shall comply with WAC 296-44-412.

(2) **High-voltage contact conductors.** Every trolley-contact conductor of more than 750 volts in urban districts where not on fences right-of-way shall be suspended so as to minimize the liability of a break and, as far as practicable, so that if broken at a single point, it can not fall within 12 feet (measured vertically) from the ground or any platform accessible to the general public.

(3) **Third rails.** Third rails shall be protected where not on fenced rights-of-way by adequate guards composed of wood or other suitable material.

(4) **Prevention of loss of contact at railroad crossings.** Trolley-contact conductors shall be arranged as set forth in either (a) or (b) following, at grade crossings with interurban or other heavy-duty or high-speed railroad systems:

(a) The trolley-contact conductor shall be provided with live trolley guards of suitable construction, or,

(b) The trolley-contact conductor shall be as far as practicable at the same height above its own track throughout the crossing span and the next adjoining spans. Where a uniform height above rail is not adhered to, the change shall be made in a very gradual manner. Where the crossing span exceeds 100 feet, catenary construction shall be used.

Exception: This rule does not apply where the system is protected by interlocking derails or by gates.

(5) **Guards under bridges.**

(a) Where guarding is required. Guarding is required where the trolley-contact conductor is so located that a trolley pole leaving the conductor can make simultaneous contact between it and the bridge structure.

(b) Nature of guarding. Guarding shall consist of a substantial inverted trough of nonconducting material located above the contact conductor, or other suitable means of preventing contact between the trolley pole and the bridge structure. [§ 28 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-430 Rules for underground lines (See also WAC 296-44-424(2)(b))—Location. (1) **General location.** Underground systems of electric conductors should be located so as to be subject to the least practicable disturbance. Railway tracks and underground structures, including catch basins, gas pipes, etc., should be avoided where practicable.

(2) **Ducts.** The ducts between adjacent manholes or other outlets should be laid as straight and direct as practicable.

(3) **Manholes.** Manhole openings shall be located so as to provide safe and convenient access. Manhole openings shall be not less than three feet from the nearest railway or street car tracks except by permission of the recognized administrative authority. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-433 Rules for underground lines (See also WAC 296-44-424(2)(b))—Construction of duct and cable systems. (1) **Material, size, and finish of ducts.** Ducts shall be of such material, size, mechanical strength, and finish as to facilitate the installation and maintenance of conductors or cables. Ducts shall be freed from burrs before laying and shall have clear bores.

(2) **Grading of ducts.** Where it is necessary to drain ducts the grade of the ducts shall be such as to permit proper and adequate drainage.

(3) **Settling.** Ducts should be suitably reinforced or be laid on suitable foundations of sufficient mechanical strength where necessary to protect them from settling.

(4) **Clearances.**

(a) General. The clearance between duct or cable systems and other underground structures paralleling them, shall be as great as practicable. The distance between the top covering of the system and the pavement surface, or other surface under which the system is constructed, shall be sufficient to protect the system from injury by traffic.

(b) Below base of rail. The top of all duct and cable system structures, except as hereafter specified shall generally be located at a depth of not less than 30 inches, in the case of street railways, and not less than 42 inches, in the case of steam and electric railroads, below the base of rail. Where unusual conditions exist or where proposed construction would interfere with existing construction, a greater depth than specified above may be required.

Exception 1: Where this is impracticable, or for other reasons, this clearance may be reduced by agreement between the parties concerned. In no case, however, shall the top of the conduit protection extend higher than the bottom of the ballast section which is subject to working or cleaning.

Exception 2: Where physical and chemical conditions will permit, a conduit consisting of not more than two iron pipes, not exceeding 4 inches in diameter, or two creosoted wood ducts not exceeding 6 inches square, or one or more cables of a type designed for burying directly in the earth used for communication lines, or for service supply circuits not exceeding 750 volts, may be laid in the ground beneath railroad tracks without any form of protection at a minimum depth of 18 inches below the base of the rail unless the worked ballast section of the roadbed exceeds 18 inches, in which case the conduit shall be laid below the ballast section.

(c) Iron pipe conduit. Where iron pipe is used as a conduit for underground cables or conductors, it shall not be laid in contact with water, gas, or steam metallic-pipe systems. Where the clearance is less than two inches, the metal conduit shall be adequately separated from other metallic-pipe systems by a barrier of suitable materials, or they shall be electrically bonded together at the point of least separation.

(5) Separations between supply and communication duct systems.

(a) General. Duct systems, including laterals, to be occupied by communication conductors for public use

should be separated, where practicable, from duct systems, including laterals, for supply conductors by not less than 3 inches of concrete, 4 inches of brick masonry, or 12 inches of well-tamped earth.

Exception 1: Extensions may, however, be made to existing interconnected or jointly owned and jointly occupied duct systems used in common by municipalities, communication companies, or supply companies with less effective separations than above specified by permission of the recognized administrative authority.

Exception 2: Cables containing circuits of 550 volts or less between conductors and having a total transmitted power of not in excess of 3,200 watts, used exclusively in connection with the operation of a railway signal or supply system, may be carried in the same duct system with communication cables, if such construction is agreed to by all parties concerned, and where the communication cables are exclusively used for the operation of the railway signal or supply system, they may be carried in the same duct.

(b) Entering manholes. Where communication and supply conductors or cables occupy ducts terminating in the same manhole, the two classes of ducts should be separated as widely as practicable and where practicable should enter the manhole from opposite sides.

Note: This requirement is made so that cables can be racked alongside walls with a minimum of crosses between the two classes of conductors.

(6) **Duct entrances into manholes.** Iron-pipe conduit terminating in manholes, handholes, or other permanent openings of underground systems, shall be provided with an effective shield, bushing or other smooth outlet.

Exception: This does not apply to communication conductors, to supply conductors of less than 300 volts between conductors, or to armored cables of any voltage.

(7) **Sealing laterals.** Lateral ducts for service connections to buildings, through which gas or water may enter buildings or other duct systems, should be effectively plugged or cemented by the use of asphaltum, pitch, or other suitable means.

(8) **Duct arrangement for dissipation of heat.** Duct systems intended to carry supply cables of large current capacity should be arranged, where practicable, so that ducts carrying such cables will not dissipate their heat solely through other ducts. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-436 Rules for underground lines (See also WAC 296-44-424(2)(b))—Construction of manholes. (1) **Minimum strength.** The design and construction of manholes and handholes shall provide sufficient strength to sustain, with a suitable margin of safety, the loads which may reasonably be imposed on them.

(2) **Dimensions.** Manholes shall meet the following requirements where practicable:

(a) **Width.** The least horizontal inside dimension shall be not less than 3 feet 6 inches.

(b) **Height.** The vertical dimension shall be not less than 6 feet except in manholes where the opening is within 1 foot of each side of the full size of the manhole.

Exception: The dimensions specified in 1 and 2 above are not necessary in service boxes, handholes, or in manholes used exclusively for communication-system equipment or cables.

(c) **Working space.** Adequate and readily accessible working space shall be maintained about all electrical parts or equipment which require adjustment, examination or work of any nature done on them if exposed while in service. The horizontal clearance shall be not less than those clearances set forth in WAC 296-44-115(2). The vertical clearance shall be not less than 6 feet unless constructed in accordance with 2 above and its exception.

(3) **Drainage.** Where drainage is into sewers, suitable traps shall be provided to prevent entrance of sewer gas into manholes.

(4) **Ventilation.** Adequate ventilation to open air shall be provided for manholes from which any openings exist into subways entered by the public. Where such manholes house transformers, sectionalizing switches, or regulators, etc., the ventilator ducts shall be cleaned at necessary intervals.

(5) **Manhole openings.** No manhole shall have an opening to the outer air less than twenty-six inches in diameter, and the cover of same shall be provided with vent hole or holes equivalent to three square inches in area.

(6) **Manhole covers.** Manholes and handholes, while not being worked in, shall be securely closed by covers of sufficient strength to sustain such loads as may reasonably be imposed upon them.

(7) **Supports for cables.** Cables should be adequately supported at each manhole.

(8) **Manhole location.** Manhole openings shall, where practicable, be located so that barriers or other suitable guards can be placed to protect the opening effectively when uncovered. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-439 Rules for underground lines (See also WAC 296-44-424(2)(b))—Location of cables. (1) **Accessibility.** Cables in manholes shall be accessible to workmen and clear working space shall be maintained at all times.

(2) **Cables carrying large currents.** Cables intended to carry large currents should be located, where practicable, in outside ducts so that they will not necessarily dissipate heat solely through adjacent ducts.

(3) **Separation between conductors.**

(a) Cables of different voltages. Cables shall be arranged and supported in ducts and manholes so that those operating at higher voltages will be separated as far as practicable from those operating at lower voltages.

(b) Cables of different systems. Cables belonging to different systems, particularly supply-distribution and communication systems, shall not be installed in the same duct.

Exception: This does not apply to the insulation of railway-signal supply and communication cables in the same duct, as permitted by exception 2 in WAC 296-44-433(5)(a).

(c) Cables of supply and communication systems.

(i) General. Supply cables and communication cables for public use shall be maintained in separate duct systems, and particularly in separate manholes except by permission of the recognized administrative authority.

Exception 1: Cable extensions may be made to existing interconnected or jointly owned and jointly occupied duct systems used in common by municipalities, communication companies, or supply companies.

Exception 2: This does not apply where railway-signal supply and communication cables are carried in the same duct system as permitted in exception 2, WAC 296-44-433(5)(a).

(ii) In the same manhole. Where supply cables and communication cables for public use have been permitted by administrative authority to occupy the same manhole, they shall be maintained on opposite sides of the manhole.

Where the supply and communication cables cross in these manholes, a separation of at least one foot should be maintained. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-442 Rules for underground lines (See also WAC 296-44-424(2)(b))—Protection and separation of conductors buried in earth. (1) **Separation.** The separation between buried communication and buried supply conductors or cables shall consist of not less than twelve inches of well tamped earth, four inches of brick, or three inches of concrete.

Exception 1: this separation and protection is not required where supply circuits having a potential of 550 volts or less between conductors and having a total transmitted power of not in excess of 3,200 watts are laid adjacent to communication cables, if all cables are used exclusively for the operation of a railway-signal or supply system, and are maintained by the same company.

Exception 2: This separation and protection is not required where supply circuits have a potential of 550 volts or less between conductors and are installed using insulated conductors with a neutral conductor.

Exception 3: This separation and protection is not required where communication and power supply conductors or cables which have a potential of over 550 volts between conductors, are buried in a common trench at the same depth with random separation under the following conditions:

(a) When a concentric neutral type power cable is used. A concentric neutral type of direct burial multiple or single conductor power cable is one designed for the purpose using insulated conductors, the insulation being covered with a semi-conducting layer which has a concentrically applied multi-conductor bare neutral of

equal current carrying capacity to the insulated conductor. This neutral to consist of not less than six wires or their equivalent with a lay of not more than eight times the cable diameter.

(b) When a spiral of continuous sheath type power cable is used with a neutral of equal conductivity to the phase wire. A spiral of continuous sheath type of direct burial multi or single conductor cable is one that has a continuous or spiral metal sheath. The conductivity may be obtained with the sheath or with a separate neutral laid not more than three inches from the cable and be not smaller than No. 4 AWG. Either the separate neutral or the sheath shall be bare and in direct contact with the earth and the two shall be interconnected.

Exception 4: No separation is required between communication and supply conductors or cables located beneath transformers, switch and terminal cabinets or their supporting pads or structures.

(2) **Protection at crossings of cables.** At all crossings where buried supply conductors or cables are above communication conductors or cables, the supply conductors or cables shall be protected from digging operations by concrete or creosoted wood plank or equivalent mechanical protective covering extending at least two feet in each direction from the point of crossing.

Exception 1: This protection is not required where supply circuits have a potential of 550 volts or less between conductors.

Exception 2: This protection is not required where supply conductors over 550 volts between conductors are installed in accordance with subsection (1), exception 3.

(3) **Protection of cables installed parallel.** Where buried communication and buried supply conductors or cables are installed in the same trench generally parallel to each other, the buried supply conductors or cables shall be covered with concrete or creosoted wood planking or equivalent mechanical protection, except that this covering may be omitted in the following cases:

(a) Where the voltage of the supply conductors does not exceed 550 volts between conductors.

(b) Where the supply conductors or cables are encased in a continuous metallic sheath effectively grounded.

(c) Where the supply conductors or cables are installed more than two feet horizontally from communication conductors.

(d) Where supply conductors over 550 volts between conductors are installed in accordance with subsection (1), exception 3.

(4) **Fault protection.** Where buried communication and power supply conductors of 550 volts or more between conductors are installed in the same trench without separation and in accordance with the requirements of subsection (1), the cable shall be protected by fuses capable of clearing phase to ground faults. The total clearing time shall not exceed twelve cycles and such protection shall not reclose.

(5) **Identification of conductors.** Each company using a random burial method of the underground system shall

properly identify their cable and employees of a company shall know the identification of the cable belonging to their company.

(6) **Ground protection.** Where communication and power supply conductors are buried in the same trench without separation, the following ground protection shall be provided:

(a) At each transformer and/or pedestal installation, all grounds shall be interconnected. The common neutral conductor shall be continuous. Where straight splices are required in the common neutral, only two ends of the conductors shall be joined with one connector. All interconnections to the common neutral required by this section shall be made by taps to the common neutral, including equipment neutral connections.

(b) Telephone protectors, telephone service cable shields and secondary neutrals shall be connected to a common ground at each customer's service entrance when telephone circuits are underground without separation from power conductors.

(7) **Depth of buried cables.** Where communication and power supply cables of over 550 volts between conductors are buried without separation in the same trench or without mechanical protection, the power cable shall be buried to a minimum depth of thirty inches except under railroad tracks where they shall be buried with a minimum cover of forty-two inches. In rock, a twenty-four inch minimum depth will be acceptable or a lesser depth will be accepted where an adequate means of mechanical protection is provided. [§ 29 (part), Rule 294, filed 10/30/64, effective 12/1/64; § 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-445 Rules for underground lines (See also WAC 296-44-424(2)(b))—Protection of conductors in duct systems and manholes. (1) **Protection against arcing.** A suitable fire-resistant covering should be placed on the following cables to prevent injury from arcing:

(a) Closely grouped lead-sheathed supply cables containing circuits of more than 8,700 volts, or of large current capacity operating at more than 750 volts ac or 300 volts dc.

(b) Communication cables and supply cables of large current capacity, if occupying the same side of the manhole, or if they cross each other.

(2) **Bonding.** Exposed metallic cable sheaths shall be bonded at suitable intervals with a conductor of suitable size, electrolysis conditions permitting. Supply cable sheaths need not be bonded to communication cable sheaths. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-448 Rules for underground lines (See also WAC 296-44-424(2)(b))—Guarding of live parts in manholes. (1) **Conductor joints or terminals.** Joints or terminals of conductors or cables of supply systems shall be arranged so that there are no bare ungrounded current-carrying metal parts exposed to accidental contact within manholes or handholes.

(2) **Apparatus.** Live parts of protective, control or other apparatus installed and maintained in manholes shall be enclosed in suitable grounded cases or in cases

having no exposed metallic parts. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-451 Rules for underground lines (See also WAC 296-44-424(2)(b))—Construction at risers from underground. (1) **Separation between risers of communication and supply systems.** The placing of risers for communication systems and risers for supply systems on the same pole should be avoided where practicable. Where located on streets or highways, risers should, where practicable, be placed on poles so as to be in the safest available location from the point of view of traffic damage.

The number of risers on one pole shall be so limited and the risers shall be placed so as to permit replacement of the pole upon deterioration.

(2) **Mechanical protection of conductors.** All supply conductors or cables from underground systems which connect to overhead systems shall be protected by a metal pipe or conduit which gives suitable mechanical protection up to a point not less than 8 feet above the ground and 40 inches above communication circuits for public use.

Such supply conductors or cables on the pole above this protection shall be covered with wood molding or other suitable protective material.

Exception: Armored cables.

(3) **Grounding of riser pipes.** Exposed metal riser pipes containing supply conductors shall be effectively grounded.

(4) **Conductor terminal construction.** The terminals of underground cables operating at more than 750 volts to ground and connecting to overhead open-wire systems shall meet the following requirements:

(a) Protection against moisture. Protection shall be provided so that moisture will not enter the cable.

(b) Insulation of conductors. Conductors shall be properly insulated from the grounded metal sheath. In addition, the conductors of multiple-conductor cable shall be properly separated and insulated from each other.

(c) Identification. When riser terminals used for different voltage classifications are identical, the terminals shall be readily identified by position.

(5) **Clearance above ground for open supply wiring.** For supply wires connecting to underground system see WAC 296-44-316(3). [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-454 Rules for underground lines (See also WAC 296-44-424(2)(b))—Identification of conductors. Cables shall be permanently identified by tags or otherwise at each manhole or other permanent opening of the underground system. Where the duct formation on opposite sides of the manhole is the same, the cables where practicable should be installed in corresponding ducts.

Exception: This requirement does not apply where the position of a cable, in conjunction with diagrams supplied to workmen, gives sufficient identification, or

where the manhole is occupied solely by the communication cables of one utility, or of two utility companies agreeing thereto. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-457 Rules for underground lines (See also WAC 296-44-424(2)(b))—Identification of apparatus connected in multiple. Where transformers, regulators, or other similar apparatus not located in the same manhole operate in multiple, special tags, diagrams, or other suitable means shall be used to indicate that fact.

Exception: This requirement does not apply where disconnecting devices are provided to permit cutting such equipment completely off the system. [§ 29 (part), filed 3/23/60, effective 12/1/58.]

INSTALLATION AND MAINTENANCE OF ELECTRIC UTILIZATION EQUIPMENT

WAC 296-44-460 Installation and maintenance of electric utilization equipment—General requirements—Scope. (1) **Voltage limits and occupancies.** The following rules apply to electric utilization equipment between 25 and 750 volts, where accessible to other than qualified electrical operators, as in mills, factories, mercantile establishments, hotels, theaters, and other public buildings, cars and other vehicles, dwellings, and similar places. Communication equipment connected to communication lines (see definition) is exempted, except from rules under WAC 296-44-661 through 296-44-664.

(2) **Equipment of more than 750 volts.** Equipment and conductors of more than 750 volts between conductors where accessible to other than qualified electrical operators, shall (in addition to complying with the rules of WAC 296-44-460 through 296-44-664 for conductors of more than 300 volts) comply also with the rules for electrical supply stations, WAC 296-44-079 through 296-44-271, where such rules require more than the rules of WAC 296-44-460 through 296-44-664. Current-carrying parts shall be either incased in permanently grounded metal cases or conduits, or otherwise suitably guarded to prevent access (or too close approach) to such current-carrying parts by any but qualified persons.

(3) Utilization equipment regarded as supply equipment. Electric utilization equipment, however, as well as generating equipment, if inclosed in a separate room which is inaccessible to unqualified persons, and if when in service is under the control of a qualified person, may be installed in conformity with the rules applying to electrical supply stations (WAC 296-44-079 through 296-44-271) and in that case does not come under these rules. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-463 Installation and maintenance of electric utilization equipment—General requirements. (1) **Approved equipment.** Equipment which has been subjected to examination by some properly qualified body and found to comply with the general requirements of this code, the National Electrical Code, the state of

Washington "Rules and regulations for installing electric wires and equipment," and other nonconflicting accepted standards which apply for any given purpose, should be used; otherwise, the approval of the department of labor and industries shall be obtained in advance.

Note: In order to avoid the necessity for repetition of such examinations by different examiners, frequently with inadequate facilities for such work, and to avoid the confusion which would result from conflicting reports as to the suitability of equipment examined for a given purpose, it is necessary that such examinations should be made under standard conditions, and the record made generally available through promulgation by organizations properly equipped and qualified for experimental testing, inspections of the run of goods at factories, and service-value determinations, through field inspections, and whose findings are subject to appeal to the National Bureau of Standards.

(2) **Future inspections.** Electric utilization equipment shall be installed and maintained in conformity with these safety rules. Persons in charge of equipment shall have periodic inspections of equipment and wiring made, and similar inspections shall be made by the supervising authority. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-466 Installation and maintenance of electric utilization equipment—Reference to other codes. Reference is to the other properly approved codes and particularly the National Electrical Code, state of Washington rules and regulations for industrial electric wires and equipment, and applicable local codes. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-469 Installation and maintenance of electric utilization equipment—Grounding. (1) **Grounding method.** Where grounding is required, all grounding of circuits, lightning arresters equipment, or wire raceways, which is intended to be a permanent and effective protective measure, shall be made in accordance with the methods specified in WAC 296-44-058 through 296-44-076.

(2) **Circuits required to be grounded.** All circuits included in WAC 296-44-460(1) shall be effectively grounded in accordance with the rules of WAC 296-44-058 through 296-44-076, except that the following are not are not required to be grounded:

Exception 1: Circuits on two-wire direct-current systems, provided the system is equipped with a ground detector.

Exception 2: Delta-connected three-phase circuits; except that such circuits when partly used for lighting shall be so arranged and grounded, that the lighting circuits will have the lowest practicable voltage to ground.

Exception 3: Circuits of more than 150 volts to ground.

Note: It is recommended that such circuits be grounded if the voltage to ground of any conductor of the circuit will not exceed 300 volts after grounding.

Exception 4: Electric furnace circuits. (See WAC 296-44-589.)

Exception 5: Electric crane circuits operating over combustible fibers.

Exception 6: Circuits of less than 50 volts between conductors unless run overhead between buildings, or supplied by transformers operating on circuits of more than 150 volts to ground, or by transformers operating on ungrounded circuits.

(3) **Grounding noncurrent-carrying metal parts.** Conductor armor, conductor raceways, and all equipment supplied directly by metal-encased wiring shall be grounded.

Exposed noncurrent-carrying metal parts of other fixed electric utilization equipment (such as frames of motors, cranes, cars, and switchboards, and inclosures of switches and transformers) shall be grounded under any one of the following conditions: (See WAC 296-44-058 through 296-44-076 for method of grounding, and WAC 296-44-628 for portable appliances.)

(a) If operated at more than 150 volts to ground, regardless of location.

(b) If located where exposed grounded surfaces, such as metal frames of other machines, plumbing fixtures, conducting floors or walls, exist within reach of persons while touching the metal parts under consideration. (Usually grounded surfaces within 5 feet horizontally of the parts considered and within 8 feet vertically of the floor are considered within reach.)

(c) If located where explosives, inflammable gas, or inflammable flyings normally exist in dangerous quantities, regardless of voltage.

Exception 1: Parts of machines, such as name plates, screws in wood, and similar small parts, and metal covers of fuses and switch bases which are thoroughly and effectively insulated, and which are not liable to become alive except under very unusual circumstances are not considered as coming under this rule and may be left ungrounded.

Exception 2: No ground connection need be made to expose metal frames of switchboards, motors, or lighting fixtures connected to direct-current trolley or third-rail circuits, or where accessible to qualified persons only, provided that such frames are effectively insulated from ground, and provided that the metal frames in question are so located with reference to insulating mats, floors, or platforms that persons cannot readily touch the metal frames in question without standing on such mats, floors, or platforms.

Exception 3: No ground connection need be made to metal inclosures housing interior wiring conductors, provided such inclosures do not exceed 25 feet in length, are insulated from grounded piping or other grounded surfaces and are out of reach from grounded surfaces or guarded against contact by persons.

Exception 4: No ground connection need be made to metal pipe used for the mechanical protection of interior

wiring conductors, provided each of the conductors contained are enclosed in a continuous nonconducting flexible tubing. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-472 Installation and maintenance of electric utilization equipment—Working spaces about electric equipment. (1) **Adequate space.** Suitable working space shall be provided and maintained about all electric utilization equipment.

(2) **Dimensions.** The horizontal dimension of the working space in front of live parts shall be not less than:

(a) For parts on one side of more than 150 volts to ground and no live or grounded parts on the other side of the working space, 2.5 feet.

(b) For parts on one side of more than 150 volts to ground and live or grounded parts on the other, 4 feet.

(c) For parts on one side of less than 150 volts to ground and no live or grounded parts on the other, 1.5 feet.

(d) For parts on one side of less than 150 volts to ground and live or grounded parts on the other, 2.5 feet.

(3) **Clear spaces.** Working spaces adjacent to exposed live parts shall not be used as passageways.

(4) **Elevation of equipment.** The elevation of the equipment at least 8 feet above ordinarily accessible working platforms usually affords protection at least equivalent to that provided by the horizontal clearances of B and may be used in lieu thereof. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-478 Installation and maintenance of electric utilization equipment—Guarding or isolating live parts. (1) **Inclosure or elevation.** Except as elsewhere required or permitted by this code, all bare, ungrounded live parts of electric utilization equipment, such as bus bars, conductors, and terminals, operating at more than 50 volts to ground, shall be protected by one of the following means:

(a) Inclosure, which gives access to live parts only through opening a door or cover.

(b) Guarding, as by railing, screen, or barriers which remove the liability of contact or approach.

(c) Isolation, by placing at least 8 feet above the floor line, or by removing beyond ready accessibility.

Note: Inclosures may consist of suitable casings or suitable insulating coverings. The continuous insulating covering of conductors should be depended upon only when the circuit is grounded in accordance with WAC 296-44-058 through 296-44-076 or is less than 300 volts to ground and entirely unexposed to leakage or induction from higher voltage circuits, and where in addition it is impracticable to install more suitable guards. It should be depended upon then only when the covering is not exposed to liability of mechanical injury, and is very substantial, thoroughly dry, and contains no noninsulating flameproofing compound or oil-soaked rubber. It is recommended that in addition to the protection afforded by such coverings the insulating mats or platforms called for in subsection (2) below be used.

Where covers, casings, or barriers must at any time be removed from the current-carrying parts which they guard, while these parts are alive, the covers, casings, or barriers, should be of insulating material, or so arranged that they cannot readily be brought in contact with the live parts.

(2) Exception where mats and platforms are used.

Where current-carrying parts of more than 150 volts to ground must necessarily be exposed (unguarded) within 8 feet from the floor, all surrounding conducting floors and other conducting surfaces within reach shall be covered with suitable insulating platforms, mats or other insulating devices.

Note: Mats may be of wood, held together by wood pins, or of cork matting, linoleum, or rubber. The material and construction should be suitable for the voltage concerned and for the prevailing conditions. If subject to moisture or to accumulation of conducting dust, flyings, or chips, mats should present surfaces minimizing the hazards from these sources. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-481 Installation and maintenance of electric utilization equipment—Hazardous locations.

(1) Where explosives and inflammable exist. In locations where explosives, inflammable gas, or inflammable flyings normally exist in dangerous quantities, all parts at which high temperature, sparking, or arcing is liable to occur shall be inclosed by one of the following methods:

(a) By installing in a separate room or compartment, free from explosive material.

(b) By surrounding with an inclosure of nonabsorptive, noncombustible material capable of withstanding without injury and without transmitting flame to the outside any explosion that may occur within.

(2) In wet places. External parts of lighting fixtures and all other electric equipment when within eight feet of the floor in wet locations shall be constructed of nonabsorptive insulating materials or, if of metal, shall be grounded as required in WAC 296-44-469(3). [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-484 Installation and maintenance of electric utilization equipment—Protection by disconnection.

Electric utilization equipment which will require maintenance work upon it shall have approved means of disconnecting it from all ungrounded conductors of its supply circuit.

Note: Every installation has a switch or switches controlling the power supply or subdividing it. These switches may be used as the required disconnecting means where readily accessible, but in many cases it is recommended that additional disconnecting means be provided for convenience and in order not to interfere with other apparatus.

(1) If the control apparatus opens all the main leads to the motor, and the pilot circuits are fused, a disconnecter only is required for connected loads in excess of 50 horsepower.

(2) If the control apparatus does not open all of the main leads to the motor, a circuit switch or other approved disconnecting means shall be used.

Note: By main leads to the motor is meant: dc motors—all armature circuits (not including shunt-field circuits; ac motors—all primary leads (not including the secondary leads of a slip-ring motor or the field circuit of a synchronous motor).

(3) The disconnecting means shall make all circuits of the controller and motor dead.

(4) If the disconnecting means is equipped for locking in the open position it need not be in sight of the motor.

(5) If the starter is not designed for opening the motor circuit, a circuit switch should be provided in the branch circuit of each motor. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-487 Installation and maintenance of electric utilization equipment—Identification of equipment.

(1) Safety by identification. All electric utilization equipment shall be suitably identified when added safety can be obtained thereby. (See also WAC 296-44-496, 296-44-550 and 296-44-634.)

Note: The identification may be by location, color, number, name plate, label, design, or other means.

(2) Voltage and use. The voltage and intended use shall be shown wherever it will reduce the hazard or decrease the liability of error in operation. [§ 30 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-490 Conductors—Electrical protection.

(1) Fuses and circuit-breakers. Each conductor (except neutral conductors, grounded conductors, grounding conductors, and conductors of circuits the opening of which may cause special hazard by the interruption of service or removal of protection) shall be protected against excessive current by a suitable fuse or other automatic circuit-breaking device or by the design of the system.

(2) Grounded and neutral conductors. No fuse or other automatic circuit-breaking device shall be placed in any conductor which is required to be grounded, nor in the neutral conductor of a three-wire system, except as follows:

(a) Simultaneous opening. If the automatic circuit-breaking device simultaneously opens all conductors of the circuit.

(3) Switches. Switches shall open all conductors of the circuit by one operation except as follows:

(a) The switch need not open a grounded conductor. In the case of service switches, if the switch does not interrupt the grounded conductor, other means shall be provided in the service cabinet or on the switchboard for disconnecting the grounded conductor from the interior wiring.

(b) Single-pole switches may be used in two-wire branch circuits; on grounded circuits they shall be placed in the ungrounded conductor.

(c) On three-wire systems with a grounded neutral conductor the service switch may open either outside

wire independently of the other, provided the neutral cannot be opened without opening both outside wires.

(d) Electric meters and control circuits of time switches may be connected on the supply side of the service switch and fuses or circuit-breaker on alternating-current supply not exceeding 750 volts between conductors, provided no wiring or live parts are exposed and the connections are inaccessible to unauthorized persons. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-493 Conductors—Protective covering. (1) **Mechanical protection.** Where exposed to mechanical injury, suitable casing, armor or other means shall be employed to prevent injury or disturbance to conductors, their insulation, or supports.

(2) **Bare conductors.** Bare conductors shall be used only for circuits of less than 300 volts to ground where accessible to qualified persons only, or in locations where insulated conductors are not feasible, such as contact conductors, bus bars, and battery connections. Such bare conductors shall be fixed at adequate separations by the use of suitable supports. Except at the point where a permanent ground connection is made, such conductors within buildings shall be kept insulated from the ground. Bare conductors shall not be used where inflammable gases or explosives are liable to be present. (See WAC 296-44-484 and 296-44-502.) [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-496 Conductors—Identification of conductors and terminals. (1) **Conductors.** The grounded neutral conductor of multiwire alternating-current circuits, the grounded neutral conductor of three-wire circuits and the grounded conductor of two-wire circuits shall be so arranged as to be readily identified. This may be done by maintaining a specified relative position on open wiring or the conductors may be tagged or otherwise suitably identified if run in conduits. For rubber-covered wires (not including flexible cord or fixture wire) of size No. 6 (0.162 inch) and smaller the only allowable identification shall consist of a white or natural-gray covering. This conductor shall be run and maintained without change in polarity throughout the entire installation and connected at all fittings to marked terminals or to terminals which can be identified by their location relative to others, in order to preserve the continuity of the marking.

If the system to which the circuit is connected is a grounded system, the identified conductor shall be connected to the grounded conductor of this system. The identified conductor shall be connected to the screw shell of all lampholders.

Exception: Identification need not be maintained between switch and equipment controlled.

(2) **Terminals.** All devices provided with terminals for the attachment of conductors and intended for connection to more than one side of the circuit shall, unless specifically excepted, have a pair of connecting terminals properly marked for identification, unless the electrical connection between the pair of terminals intended to be connected to the grounded conductor is clearly evident.

(a) The terminals of lighting panelboards and of devices having a normal rating exceeding 30 amperes need not be marked for identification, except as required in paragraphs (e) and (f) below for polarized receptacles for attachment plugs and polarized attachment-plug caps.

(b) The terminals of utilization appliances need not be marked to indicate the proper connection to the grounded conductor. If a terminal of an utilization appliance which includes single-pole switches is marked for identification, the switches shall not be connected in the identified conductor of the circuit.

(c) The terminals of portable appliances need not be marked for identification.

(d) Devices, to the terminals of which only one side of the line is connected, need not have terminals marked for identification.

(e) Two-wire attachment-plug receptacles without screw shells, and two-wire attachment-plug caps, unless of the polarity type, need not have their terminals marked for identification. Two-wire polarized receptacles for attachment plugs and polarized attachment-plug caps shall have the terminal intended for connection to the grounded conductor marked for identification.

(f) Three-wire attachment-plug receptacles and three-wire attachment-plug caps, in which one terminal may be used for the connection of a grounding conductor, shall have such terminal identified in a manner differing from that specified in subsection (3) below. The other terminals need not be marked for identification.

(g) In the case of devices with screw shells, the identified terminal shall be the one connected to the screw shell. This does not apply to screw shells which serve as plug fuseholders.

(h) In the case of screw-shell devices with attached leads, the conductor attached to the screw shell shall have white or natural-gray finish. The outer finish of the other conductor shall be of a solid color that will not be confused with the white or natural-gray finish which is to indicate the grounded conductor.

(3) **Means of identification of terminals.** The marking of terminals shall be done by means of a metallic plated coating substantially white in color, as nickel or zinc, or the terminals may be of material substantially white in color. The other terminals shall be of a readily distinguishable different color. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-499 Conductors—Guarding and isolating conductors. Insulated conductors of more than 300 volts to ground, or open, bare, ungrounded conductors of all voltages, if less than 8 feet above the floor or working platform and accessible to unqualified persons, shall be guarded by approved screens, barriers, or enclosures. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-502 Conductors—Guarding in damp or hazardous locations. (1) **Support of conductors in damp locations.** Conductors in damp locations or where exposed to corrosion, if not in waterproof conduit, or in waterproof metal sheaths in other suitable ducts,

shall be effectively isolated and supported on insulators of a suitable type.

(2) **Conductors in hazardous locations.** Conductors in locations where inflammable gas normally exists shall be in grounded rigid metal conduit. All fittings and outlets for conduit shall be electrically and mechanically continuous with the conduit, and the conduit shall be sealed by the use of suitable potheads or equivalent devices to prevent entrance of gases.

Conductors in locations where inflammable flyings normally exist shall be in grounded rigid metal conduit or cable approved for the purpose. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-505 Conductors—Precautions against excessive inductance and eddy currents. Supply conductors of alternating-current or direct-current circuits should not be run in separate iron conduits or on opposite sides of I beams or other iron structures or to be otherwise run so as to increase abnormally the self-inductance of the circuit.

Note: Such construction, by introducing large self-inductance in direct-current circuits, causes fuses to blow explosively; in alternating-current circuits it causes heating due to eddy currents in the metal. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-508 Conductors—Splicing and taping. Conductors shall be so spliced or joined as to be mechanically and electrically secure without solder and, unless made with a suitable splicing device, shall then be soldered with a fusible metal or alloy. Ends and joints of insulated conductors, unless otherwise adequately guarded, shall have equal insulating covering with other portions of the conductor, and this covering shall be securely held in place. [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-511 Conductors—Uninsulated conductors. Uninsulated conductors may be used in the following cases under the conditions specified below: (1) As a grounded neutral service conductor, provided the secondaries of the supplying system operate at not more than 208 volts to ground and the conditions specified in WAC 296-44-067 for a common grounding conductor are met. Except in the service drop, such an uninsulated service conductor shall be part of an approved type of service cable or shall be installed in a rigid metal raceway.

(2) As a grounding conductor for equipment, as a common grounding conductor, or as an independent circuit-grounding conductor if used where a common grounding conductor is permissible. (See WAC 296-44-058 through 296-44-076 for installation method.) [§ 31 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-514 Fuses, circuit-breakers, switches and controllers—General requirements for switches. (1) Accessibility, marking, and installation.

(a) All switches, fuses, automatic circuit-breakers, motor starters, and other control devices shall be readily and safely accessible and shall be installed in such a

manner as to minimize the danger of accidental operation.

(b) The place of operation of starters and controllers for motors, heating, and furnaces shall be within sight of the motor or equipment controlled, except where it is inaccessible to other than qualified and authorized persons, or where the controller or disconnecting means is capable of being locked in the "off" position.

Note: This is to minimize the hazard of starting when persons are in dangerous positions, but exception is made to permit the remote control of fans, pumps, etc., when properly isolated.

(c) Where practicable, switches shall be so installed that gravity cannot close them; and such switches as may close by gravity shall be provided with a stop block or latch to prevent accidental closing.

(d) Oil switches and oil circuit-breakers shall be marked with the following data:

- (i) Manufacturer's name and address.
- (ii) Manufacturer's type and designation number.
- (iii) Rated amperes.
- (iv) Rated volts.
- (v) Frequency if other than 60 cycles.

Such marking shall be placed on the switch or circuit-breaker and not on removable parts that may be interchanged.

(2) **Switches for special circuits.** Switches controlling emergency lighting circuits, elevator circuits, circuits in theaters, hospital operating rooms, and other circuits, the interruption of which might cause special hazard, shall be arranged so as to be accessible only to authorized persons.

(3) **Control of exit and emergency lights.** In buildings where emergency and exit lamps are installed, the control switch shall be located where it will be under competent supervision.

(4) **Control of exit lights in assembly halls.** Exit lamps and all lamps normally kept lighted in halls, corridors, and any other parts of theaters and other public assembly halls used by the audience except the general auditorium lighting, shall be supplied independently of the stage lighting and shall be controlled from the lobby or other place convenient to the main entrance to the building. In addition to the control required by the foregoing, there may be—

(a) A switch at the main service or on the control panel of special current source.

(b) A switch located adjacent to the emergency switch, or an automatic light-actuated device approved for the purpose, to control separately those lights on the exterior of the building which are not required for illumination when there is sufficient daylight. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-517 Fuses, circuit-breakers, switches and controllers—Hazardous locations. When necessary to install fuses, circuit-breakers, switches, or other control devices in locations where explosives, inflammable gas, or inflammable flyings exist, they shall be suitably protected. (See WAC 296-44-484.) Flush snap

switches, if mounted in ungrounded metal boxes and located within reach of conducting floors or other conducting surfaces, shall be provided with covers of nonconducting material. (Usually grounded surfaces within 5 feet horizontally of the parts considered and within 8 feet vertically of the floor are considered within reach.) [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-520 Fuses, circuits-breakers, switches and controllers—Where switches are required. (1) **Service switches.** Suitable switches and fuses, or circuit-breakers, or equivalent devices shall be installed in all ungrounded service conductors connecting utilization installations to the main service conductors from either overhead or underground lines. If fuses are used, unless access to them is under the control of the electric service company, they shall be disconnected by opening the service switch.

Service switches and fuses, or circuit-breakers, or equivalent devices shall be readily accessible and as close as practicable to the point where the service enters the building.

Unless mounted upon a switchboard or panelboard accessible to qualified persons only, service switches, fuses, and circuit-breakers shall be inclosed. Switches shall be operable without opening the inclosure unless additional switches are provided for separate control of the individual circuits, such switches being inclosed and externally operable.

If supply is from two or more different sources, the switch or switches controlling the supply shall be so constructed or arranged that it will be impossible to connect to one source unless the other is disconnected.

Exception: Floating batteries or supply units or systems normally operated in parallel.

(2) **Circuit switches.** Suitable switches, circuit-breakers, or equivalent devices shall be inserted in all circuit leads to lamps, motors, transformers, storage batteries, electric furnaces, and similar utilization equipment to make possible the disconnection of all such equipment from the source of supply.

Note: On a branch circuit not exceeding 15 amperes or 150 volts, plug fuses are recognized as an equivalent device.

Exception 1: Parts or pieces of apparatus intended to operate as a unit, as a motor and its starting device, may be controlled by one switch.

Exception 2: The switch need not open a grounded conductor. (See Wac 296-44-490(2) and (3).)

Exception 3: A group of incandescent lamps on the same branch circuit may be disconnected by one single-pole switch in the ungrounded conductor.

Exception 4: One switch may serve to disconnect several motors and their starting devices from the source of supply, if it complies with WAC 296-44-487.

Note: The use of a disconnecting means for each motor or a group of motors is a question of judgment, depending upon frequency of attention required by the motor and controller.

Single-pole switches shall not be placed in any neutral or grounded conductor. Three-way switches, or three-way and four-way switches used in combination, shall be classed as single-pole switches, and shall be so wired that only one pole of the circuit will be carried to any switch.

(3) **Fuses.** Switches shall be provided as necessary to make possible the disconnection of all fuses from the source of electrical supply before being handled, except as provided in WAC 296-44-526(2).

(4) **Switches or plugs on portables.** Switches or plug connectors shall be installed to permit the disconnection of temporary wiring, or of portable conductors from permanent or fixed wiring.

(5) **Emergency stop switches.** On equipment where the failure of any part of the operating or control circuits may create a life hazard and on equipment where there is possibility of the operator being caught or injured in the normal operation of the machine (such as rolls, mixers, beaters, etc.), an emergency stop switch shall be provided accessible to the operator in his usual working location. This switch shall be of a different color from any other switches on the operating or control panel and shall be clearly marked "Emergency Stop." Such switch shall not be dependent upon the action of springs for opening but shall be positively opened by the movement of the operating member itself. Springs may, however, be used to accelerate the separation of current-carrying parts. The circuit shall be so arranged that once the emergency stop switch has been operated, the equipment cannot be started without going through the normal starting sequence. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-523 Fuses, circuit-breakers, switches and controllers—Character of switches and disconnectors. (1) **Capacity of switches.** Switches used otherwise than as disconnectors shall have a capacity such as to insure safe interruption, at the working voltage, of the greatest current which they will be required to carry continuously, and shall be marked with the current and voltage for which they are rated.

(2) **Capacity of disconnectors and warning signs.** Disconnectors shall be of suitable voltage and ampere rating for the circuit in which they are installed and shall be accessible only to properly qualified persons. They shall also be protected by signs warning against opening them while carrying current in excess of the safe opening limit.

Note: Interlocking arrangements are desirable to prevent opening of such disconnectors under loads beyond their safe opening capacity and locking arrangements to prevent accidental opening.

(3) **Locking or blocking.** Where dependence for maintaining an open circuit as a protection for persons against unexpected starting or energizing the circuit is

put on certain switches or circuit-breakers, such switches or circuit-breakers shall be so arranged that they can be locked, blocked, or otherwise secured in the "Off" or "Open" position. (See WAC 296-44-538(1) and (2) and 296-44-541(12).)

Exception: Small-capacity snap switches, if near machines and in plain sight from all parts of the machines controlled are exempted. Switches of any size are exempted if the installation comprises only one motor, and the switch is in plain sight from all parts of the machines operated by the motor.

Note: Locking is to be preferred to blocking, wherever parts of the machinery driven are remote from the point of control.

(4) **Good contact.** Switches, controllers, and rheostats shall be so constructed as to make and maintain good contact. Knife switches shall maintain such alignment under service conditions that they may be closed with a single unhesitating motion.

(5) **Inclosure of switches.** Switches shall be of inclosed type unless inaccessible to other than qualified persons (see WAC 296-44-538).

(6) **Manual operation for power-operated apparatus.** It is recommended that power-operated circuit-breakers and similar switching apparatus be provided with means for readily closing them manually, and such equipment shall be provided with means for readily opening them manually. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-526 Fuses, circuit-breakers, switches and controllers—Disconnection of fuses and thermal cut-outs before handling. (1) **Automatic disconnection.** Fuses in circuits of more than 150 volts to ground shall, where accessible to others than qualified electrical attendants, be so arranged that the fuses are necessarily disconnected from all sources of electric energy before they can be touched. Where the circuit voltage is less than 150 volts to ground, this protection is recommended.

Note: This may be accomplished by a construction in which the fuse and its exposed current-carrying connections are accessible only when disconnected from the circuit, either by opening the fuse inclosure or by other means.

Where fuses are in locked cabinets (or otherwise made accessible only to qualified persons) sufficient protection is usually secured for all voltages if switches are provided to disconnect the fuses from all sources of electric energy.

If switches and fuses are inclosed in metal cabinets and live terminals are accessible, greater hazard to one replacing a fuse exists than if they were not so inclosed, as the live terminals are adjacent to grounded metal.

(2) **Switch ahead of the fuse.** Where fuses are not arranged so that they are necessarily disconnected from all sources of electric energy before they can be touched, switches shall be so placed or arranged that opening them will disconnect the fuses from all sources of electric energy, except service and meter switches, access to

which is controlled by the electric service company. If in order to comply with the above, the supply wires must be connected to certain terminals, such terminals shall be marked "Line" and the other terminals shall be marked "Load," or with other appropriate designation.

Electric meters and control circuits of time switches may be connected on the supply side of the service switch and fuses or circuit breaker on alternating-current supply not exceeding 750 volts between conductors, provided no wiring or live parts are exposed and the connections are inaccessible to unauthorized persons.

(3) **Live load.** Where a fused inclosed switch, accessible to unqualified persons, is connected between a source of supply and a live load of more than 150 volts to ground, as in the charging circuit of a storage battery, switches shall be used in which the fuses are so arranged that they will be disconnected before they become accessible unless a supplementary switch is provided for disconnection of the live load from the fuses.

(4) **Thermal cut-outs.** Thermal cut-outs shall comply with the requirements for fuses in (1) and (2). [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-529 Fuses, circuit-breakers, switches and controllers—Arcing or suddenly moving parts. (1) **Location.** Fuses and circuit-breakers shall be so located and shielded that persons will not be burned or otherwise injured by their operation.

(2) **Suddenly moving parts.** Handles or levers of circuit-breakers and similar parts which may move suddenly in such a way that persons in the vicinity are liable to be injured by being struck by them shall be guarded or isolated. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-532 Fuses, circuit-breakers, switches and controllers—Grounding noncurrent-carrying metal parts. Exposed noncurrent-carrying metal parts of switch and fuse cases, levers, and other similar parts to which leakage may occur from live parts shall be effectively grounded according to the provisions of WAC 296-44-472.

Exception: Small parts, such as name plates, screws, and metal covers of fuses and switch bases, which are thoroughly and effectively insulated, and which are not liable to become alive except under very unusual circumstances, are not considered as coming under the rule and may be left ungrounded. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-535 Fuses, circuit-breakers, switches and controllers—Guarding live parts. (1) **Guard disks and handles.** All manual switches, except switches less than 150 volts to ground and limited by fuses or automatic circuit-breakers to 60 amperes, shall have suitable casings or guards protecting the operator from danger of contact with current-carrying parts, or shall be provided with insulating handles and suitable insulating guard disks or shields so arranged between the handles and the live parts as to prevent the hand from slipping into contact with live parts or being burned by arcing at the switches.

(2) **Inclosure.** Current-carrying parts of switches, fuses, or automatic circuit-breakers of more than 300 volts to ground shall be provided with inclosing guards, effective during ordinary operation; and if accessible to other than qualified persons, current-carrying parts of more than 150 volts to ground shall be provided with such inclosing guards.

(3) **Platforms and mats.** Where switches or fuses of more than 150 volts to ground are not guarded during ordinary operation, suitable insulating floors, mats, or platforms shall be provided on which the operator must stand while handling the switches, fuses, or automatic circuit-breakers, and (unless operators invariably wear suitable insulating gloves while handling the switches) any conducting walls or machine frames within 3.5 feet shall be provided with suitable insulating guards.

Note: The suitable guarding of live parts will obviate the necessity for such insulating floors and other devices, and where use of such devices is impracticable from the nature of the location or mechanical process carried on, guards should always be used.

(4) **Blades dead.** Single-throw switches shall be so connected as to have no exposed blades alive when a switch is open, if the circuit configuration will allow. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-538 Fuses, circuit-breakers, switches and controllers—Inclosed air-break switches (not including snap switches). (1) **Locks for switches.** Inclosed switches, if used to comply with the requirement in WAC 296-44-484(5), 296-44-523(3), 296-44-541(8)(b), and 296-44-613(4), shall be provided with means for locking or sealing the switch in the "Off" position.

(2) **Locks for disconnectors.** Inclosed disconnectors shall have provisions for locking in both open and closed positions, where accessible to unqualified persons.

(3) **Marking.** Inclosed switches shall be plainly marked to show the manufacturer's name or trademark, the rating of the switch in amperes and volts (ac or dc), the open and closed positions of the switch handle, and when necessary for proper functioning, the terminals to be connected to "Line" and "Load." The marking of the manufacturer's name, the voltage, and the open and closed positions shall be on the outside of the case.

(4) **Operating handle.** Switches of the inclosed type shall be externally operable, and the external operating handle (if one is used) shall be of substantial construction, readily accessible, and provided with positive stops limiting its motion.

(5) **Grounding.** Inclosures and metal handles of switches shall be effectively grounded according to the provisions of WAC 296-44-472(3).

Note: Where a handle consists of a metal rod using the wall of the case as a bearing, and a test at rated voltage shows that the two make electrical contact, the handle will not need a separate ground connection.

(6) **Unused openings plugged.** All unused conduit and wiring openings in switch inclosures shall be effectively

closed by metal plugs or plates. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-541 Fuses, circuit-breakers, switches and controllers—Control equipment. (1) Classes of inclosures. Inclosures are classified as follows:

Class I.—A solid inclosure without slot or other opening.

Class II.—A solid inclosure except for a slot for the operating handle or openings for ventilation, or both.

Class III.—Wire mesh, perforated screens, or grillwork.

(2) **Material for inclosures.** Cast metal for inclosures whether of iron or other metal, shall be at least 1/8 inch in thickness at every point and of greater thickness at reinforcing ribs and door edges; except that die-cast metal may be not less than 3/32 inch in thickness for an area greater than 24 square inches or having any dimension greater than 6 inches, and may be not less than 1/16 inch in thickness for an area of 24 square inches or less, or having no dimension greater than 6 inches. Cast metal shall be at least 1/4 inch in thickness at threaded holes for conduit.

The minimum thickness required for sheet-metal construction varies with the size of the device. For classes I and II, protective parts of sheet metal shall be of gage not less than that given in Table 1.

TABLE 1.—Thickness of inclosures

Maximum volume of inclosure	Maximum area of any surface	Maximum dimension	Minimum thickness of metal—U. S. Std. Gage	
			Without supporting frame	With supporting frame or equivalent reinforcing
cu. ft.	sq. in.	in.		
3/4	—	12	20	24
1	—	18	18	20
—	360	24	16	18
—	1,200	48	14	16
—	1,500	60	12	16
—	Over 1,500	—	10	16

Wire screening used for inclosures shall conform to the following:

Maximum opening in screen	Minimum wire size steel wire gage
1/2 inch	No. 16
More than 1/2 inch and not more than 2 inches	No. 12

If the opening is more than one-half inch, the inclosure shall not be less than 4 inches from any live part.

(3) **Clearances.** (a) There shall be sufficient space within the inclosure to permit uninsulated parts of wire terminals to be separated so as to prevent their coming in contact with each other. Inclosures shall be such as to permit proper wire connections to be made with adequate spacing of the terminals and ends of conductors from adjacent points of the inclosures.

(b) Exposed nonarcing current-carrying parts within the inclosures shall have an air space between them and the uninsulated part of the inclosure of at least 1/2 inch for 750 volts or less, except that in a controller or other small device rated at not more than one horsepower and 300 volts and having an inclosure adequately rigid, the spacing may be less than 1/2 inch but not less than 1/8 inch in air nor less than 1/4 inch over the surface of insulating material. Inclosures of sizes, materials, or forms not having adequate rigidity shall have greater spacing. A suitable lining of insulating material not less than 1/32 inch in thickness may be provided in lieu of the air space of 1/2 inch.

(4) **Securing covers, etc.** All inclosures and parts of inclosures, such as doors, covers, tanks, etc., shall be provided with means for firmly securing them in place. Among the available means are locks, interlocks, screws, and seals.

(5) **Rating of controller.** A controller shall have appropriate ratings of voltage, frequency, and horsepower.

(6) **Marking of controllers.**

(a) Controllers should be marked to indicate the duty for which they are designed, such as starting, intermittent, varying, continuous, etc.

(b) Controllers shall be marked with their ratings in volts and horsepower and in addition if for alternating current, the cycles and number of phases.

(c) Parts of controllers which are operated manually (controller handles, push-button stations) shall be marked, if necessary, to indicate proper operation.

(d) Every controller shall be provided with a wiring diagram and, where practicable, this diagram shall be permanently attached to the controller or its mounting. All incoming and outgoing terminals of the control equipment shall be marked to correspond with the markings on the diagram.

Note: It is very desirable that instruction books, tags, or cards accompany each controller installation, showing in detail how to properly repair and adjust various parts of the equipment.

(e) Field rheostats shall be marked to indicate the total ohms, volts, ampere capacity of first step, and ampere capacity of last step.

(f) A thermal cutout used as part of the control equipment shall be marked with the maximum rating of the fuse with which it can be used safely.

(7) **Guarding live parts.**

(a) Controllers and electric remote-control stations operating at 50 volts or more between conductors shall be guarded against accidental contact of persons with live parts by inclosure or guarding or location.

(b) Manual controllers and manually operated electric remote-control stations operating at more than 150 volts to ground shall be externally operable.

(c) Controllers shall be guarded against contact with live parts by conducting objects by inclosure or guarding or location. Consideration shall be given to possible hazards, from above, from cranes or other moving apparatus; from below by objects placed under the controller mounting; and from objects being carried by persons, such as pipe, tools, etc.

(8) **Protection for workmen.**

(a) Any controller installation operating at over 300 volts to ground which, for any reason, must be alive when maintenance work is being done shall comply with the following:

(i) Live parts shall be accessible only to qualified and authorized persons.

(ii) An insulating mat or platform shall be provided on which a person must stand while inspecting or working on the controller.

(iii) Any conducting surfaces within 3 1/2 feet of the controller shall be provided with insulating guards.

(b) Means shall be provided for disconnecting all ungrounded conductors from the controller, except that controllers described in subparagraph (a) above are not required to have such disconnecting means if the controller opens all ungrounded conductors to the motor. The disconnecting means may be in the same inclosure or on the same panel as the controller. If not within sight of the controller, it shall be provided with means for locking it in the open position.

(9) **Guarding arcing parts.** Controllers shall be so located or shielded as to protect operators and other persons in the vicinity from burns or eye-flash which might result from arc-rupturing parts and so as to prevent arcing to adjacent surfaces. For this latter purpose, controllers installed without inclosure, and controllers whose inclosure is built up during or after installation of the controller, shall have the air spaces (or barriers) given in Table 2 between arc-rupturing parts and the walls of metal inclosure or other adjacent surface.

TABLE 2.—Air spaces in controllers

Horsepower rating	Distance from contacts in direction of blow-out				Vertical distance above contacts without blow-out				Horizontal distance from contacts and distance below contacts			
	dc and ac		dc		ac		dc and ac		dc and ac		dc and ac	
	300 volts	750 volts	300 volts	750 volts	300 volts	750 volts	300 volts	750 volts	300 volts	750 volts	300 volts	750 volts
	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches	Inches
5.....	1 3/4	3	4	1	1 3/4	3	3/4	1				
1/2												
10.....	2	4	5	1	2	4	3/4	1				
1/2												
50.....	3	5	6	1	3	5	1	2				
100.....	4	1	1	1	4	1	2	3				
Above 100..	1	1	1	1	1	1	1	1				

¹Barrier.

Note: All distances to be measured from contact tips or arc horns. Voltage values given are between conductors.

(10) **Location of controller.** All points from which the motor is controlled shall be within sight of the motor unless that is impracticable, in which case there shall be means readily available to the person inspecting the motor for preventing operation of the controller.

(11) **Overcurrent protection.** Control equipment shall include an automatic device which will interrupt the

electric power if the current exceeds a predetermined value. Such overload protection need not be a part of the controller but may be a separate unit. If a part of the controller, such overload protection shall conform to all applicable rules for the control equipment.

(12) **Under-voltage protection.** If the automatic re-starting of a motor on restoration of voltage may result in injury to any person under-voltage protection shall be furnished. See WAC 296-44-568(4).

(13) **Open-phase or phase-reversal protection.** If the motor operates equipment which is of such a nature that the opening of one phase of a polyphase circuit or the reversal of a phase or phases would result in possible injury to any person, means shall be provided which will prevent starting of the motor under such a condition. [§ 32 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-544 Switchboards and panelboards—Accessibility and convenient attendance. (1) **Control arrangement.** Switchboards and panelboards shall have all switches so arranged that the means of control are readily accessible to the operator.

(2) **Location of instruments.** Instruments, relays, or other devices requiring reading or adjusting shall be so placed that work can be readily performed from the working space provided. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-547 Switchboards and panelboards—Location and illumination. Switchboards shall be so placed that the persons necessarily near the board will not be endangered by machinery or equipment located near the board. Means for adequate illumination shall be provided.

Switchboards shall be made of noncombustible material and shall be kept free from moisture.

Switchboards shall be so installed and supported that they will withstand the stresses imposed by the operation of the apparatus mounted thereon, braces or other framework being installed if necessary, as covered in the General Safety Standards of Washington. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-550 Switchboards and panelboards—Arrangement and identification. Connections, wiring, and equipment of switchboards and panelboards shall be arranged in an orderly manner and all switches, fuses, and automatic circuit-breakers shall be plainly marked, labeled, or arranged so as to afford ready means for identifying circuits or equipment supplied through them.

It is recommended that a diagram of switchboard or panelboard connections and devices be kept posted in some convenient place near such equipment. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-553 Switchboards and panelboards—Spacing, barriers and covers. (1) **Separation of bare parts.** Bare parts of different potential on the front of switchboards, if accessible to unqualified persons, shall be so located or protected that they will not be readily short-circuited by tools or other objects.

(2) **Portable covers or shields.** Switchboards shall have current-carrying parts which are ordinarily isolated or guarded, but which may occasionally require adjustment or repair while alive, so arranged that suitable portable covers or shields can be effectively placed to protect workmen from contact with any neighboring live parts. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-556 Switchboards and panelboards—Grounding frames. Switchboard frames and metal cabinets shall be effectively grounded, with the exception noted in WAC 296-44-472. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-559 Switchboards and panelboards—Guarding current-carrying parts. (1) **Inclosure of parts at more than 150 volts to ground.** No switchboard or panelboard operating at more than 150 volts to ground shall have current-carrying parts exposed within 8 feet of the floor, unless accessible only to qualified operators. Parts of 100 to 150 volts to ground should not be accessible to unqualified persons. Locked cabinets or other inclosures may be provided where necessary to prevent such exposure. If the current-carrying parts are at any time exposed while alive, conducting floors about such boards shall be provided with a suitable insulating platform or mat so placed that no live parts can be inadvertently touched except while standing on the platform or mat. (WAC 296-44-481 and 296-44-535.)

(2) **Inclosure of low-voltage parts.** All switchboards and panelboards should be so arranged that current-carrying parts less than 150 volts to ground and less than 5 feet above the floor are inclosed in cabinets or screens.

Note: This is an effective precaution against accidental short-circuit or contact by persons in the vicinity.

(3) **Plug-type boards.** Plug-type switchboards if of more than 150 volts to ground, shall have no current-carrying parts exposed on face of boards, and plug connectors shall have all current-carrying parts guarded as long as they are alive.

(4) **Dead-front boards.** Switchboards having no current-carrying parts exposed on the face (working space) shall be used in theaters and similar places where rapid handling is necessary and the attention must be given to signals or to other processes.

(5) **Theater boards.** Theater switchboards at any voltage having current-carrying parts exposed on back to passersby shall be elevated or guarded by suitable railings to prevent contact with live parts. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-562 Switchboards and panelboards—Fuses on switchboards. (1) **Disconnection of fuses.** Fuses on switchboards shall be arranged in one of the following ways:

(a) So that they are necessarily disconnected from all sources of electric energy before they can be touched.

(b) So that they can be disconnected from all sources of electric energy by a switch.

(c) So that they can be conveniently handled by means of suitable insulating tools provided for the purpose.

When switchboards are accessible to unqualified persons the protection specified in (a) shall be provided if the voltage exceeds 150 volts to ground and should be provided if the voltage is less than 150 volts to ground.

(2) **Location of fuses.** Fuses shall be so located as to obviate the danger in removing or replacing them of short-circuiting other live parts. Open-link fuses shall not be installed on switchboards. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-565 Switchboards and panelboards—Panelboards. (1) **Arrangement of equipment.**

(a) Location of fuses. Fuses shall be so located as to limit as far as practicable the danger of short-circuiting other live parts when removing or replacing them.

(b) Connection of plug-fuse shells. The shells of plug-fuse holders in ungrounded conductors shall be connected to the load side of the circuit on all panelboards employing plug fuses without switches in main or branch circuits.

(2) **Material.** Panelboard bases shall be made of nonabsorptive, noncombustible insulating material.

(3) **Marking.** Panelboards shall be plainly marked to show the manufacturer's name or trade-mark and the rating in volts and amperes. The ampere rating shall be the maximum capacity of the busses.

(4) **Protection against moisture.** Where panelboards are installed so as to be exposed to excessive moisture they shall be inclosed in weatherproof cabinets.

(5) **Hazardous locations.** Panelboards shall not be installed where hazardous conditions exist due to the presence of inflammable gas or inflammable dust or flyings, except as permitted by WAC 296-44-484.

(6) **Residences.** Panelboards in residences shall be so installed that the lowest live part exposed when the cabinet door is opened to permit operation of switches shall not be less than 4 feet from the floor. [§ 33 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-568 Motors and motor-driven machinery—Control devices. (1) **Speed limitation.** Machines of the following types shall be provided with speed-limiting devices, unless their inherent characteristics or the load and the mechanical connection thereto are such as to safely limit the speed or unless the machine is always under the manual control of a qualified operator:

(a) Separately excited direct-current motors.

(b) Series motors.

(c) Motor-generators and converters which can be driven at excessive speed from the direct-current end as by a reversal of current or decrease in load.

Note: The required limitation of speed may be obtained by the use of a relay, centrifugal switch, or other similar device which will cut off the supply of energy when excessive speed is attained.

(2) **Adjustable-speed motors.** Adjustable-speed motors, if controlled by means of field regulation, shall be

so equipped and connected that the field cannot be weakened sufficiently to permit a dangerous speed, and so that the motor cannot be started under weakened field unless the motor is designed for such starting.

(3) **Wiring.** Where speed-limiting devices or remote-control switches are electrically operated, the control circuits by which such devices are actuated shall be adequately guarded, by conduit or otherwise, against mechanical injury.

(4) **Under- or low-voltage protection.** Where the re-starting of the motor on restoration of voltage may result in injury to any person or persons, under- or low-voltage protection shall be furnished. When the motor and driven machinery are isolated and accessible to qualified persons only, the provision of a disconnecting switch eliminates the hazard. [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-571 Motors and motor-driven machinery—Hazardous locations. Motors in which sparking or arcing can occur during operation shall, when in locations where explosives or inflammable gas or inflammable flying exist, be suitably protected as described in WAC 296-44-472(3) and 296-44-484. [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-574 Motors and motor-driven machinery—Deteriorating agencies. (1) **Inclosures.** Suitable guards or inclosures shall be provided to protect exposed current-carrying parts of motors and the insulation of motor leads where installed directly under equipment or in other locations where dripping oil, excessive moisture, steam, vapors, chemicals, or similar injurious agencies exist.

(2) **Grounding frames.** The metal frames and other exposed noncurrent-carrying metal parts of equipment in these locations shall be effectively grounded. (See WAC 296-44-472(3).) [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-577 Motors and motor-driven machinery—Guards for live parts. (1) **Inclosure of live parts.** Motors of more than 150 volts to ground, unless isolated by elevation at least 8 feet above the floor line, should be provided with permanent inclosures or other suitable guards so arranged as to prevent persons or conducting objects from inadvertently coming or being brought into contact with live parts or interfering with the operation of the motors.

(2) **Mats and platforms.** Suitable insulating mats or platforms of substantial construction and providing good footing shall be so placed on floors and, if necessary, on frames of machines having exposed live parts of more than 150 volts to ground that the operator or other persons in the vicinity cannot readily touch such parts unless standing on the mats, platforms, or insulating floors.

Note: The suitable guarding of live parts by inclosures or barriers effective during attendance or necessary adjustments of live parts will obviate the necessity for insulating mats, and where such mats are impracticable from the nature of the location or processes carried on, guards shall always be used.

Where connectors are used in motor leads, these should be provided with insulating covering equal to that on the conductors.

(3) **Steps and handrails.** Where necessary, steps and handrails should be installed on or about large machines to afford safe access to live parts which must be examined or adjusted during operation. [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-580 Motors and motor-driven machinery—Grounding machine frames. Where two or more machines, either of which operates at more than 150 volts to ground, are mechanically coupled together, and the operator can touch the frames of more than one at a time, the frames of all such machines shall be effectively grounded as required by WAC 296-44-472(3), unless they are bonded together electrically and surrounded by insulating mats or platforms on which persons must stand in order to touch the machine frames. If operating at more than 300 volts to ground, their frames shall always be grounded as required by WAC 296-44-472(3), and frames shall also be grounded wherever, from the nature of the location or of processes carried on, the use or maintenance of insulating mats or platforms is impracticable. [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-583 Motors and motor-driven machinery—Protecting moving parts. Suitable guards or inclosures shall be arranged at each motor or motor-driven machine when necessary to prevent persons or objects from inadvertently coming in harmful contact with moving parts, including chains, belts, gears, and pulleys. [§ 34 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-586 Electric furnaces, storage batteries, transformers, and lightning arresters—Protection from burns. (1) **Inclosure of glowing parts.** Electric furnaces and apparatus used for arc welding, where intensely glowing incandescent or arcing parts are exposed, shall be inclosed so that those parts will not be accessible or visible to unqualified persons.

(2) **Screens, hoods, goggles.** Suitable protecting screens, hoods, goggles, gloves, and other devices shall be provided for the qualified persons who must work or come near such exposed parts. (See American Standard Safety Code for the protection of the heads, eyes, and respiratory organs, ASA A2, for mechanical and optical protection.) [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-589 Electric furnaces, storage batteries, transformers, and lightning arresters—Grounding of furnace frames. The outside noncurrent-carrying metallic frames of furnaces shall be effectively grounded if they contain current-carrying parts connected to circuits of more than 150 volts to ground, or if the circuit within is not grounded and is exposed through transformer windings to a circuit of more than 150 volts to ground. [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-592 Electric furnaces, storage batteries, transformers, and lightning arresters—Guarding live parts. Except at points where necessarily left exposed (as at spot-welder contacts), current carrying parts of furnaces, welders, and control equipment of more than 150 volts to ground, shall be suitably guarded with inclosures or barrier guards. [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-595 Electric furnaces, storage batteries, transformers, and lightning arresters—Storage batteries. The installation of nonportable storage batteries shall be in accordance with WAC 296-44-142 through 296-44-166 of the rules for stations. [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-598 Electric furnaces, storage batteries, transformers, and lightning arresters—Transformers. The installation of transformers having either winding of more than 300 volts to ground shall comply with WAC 296-44-169 through 296-44-184 of the rules for stations, and if the operating voltage of any winding exceeds 750, the transformers shall be made inaccessible to unqualified persons. [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-601 Electric furnaces, storage batteries, transformers, and lightning arresters—Lightning arresters. The installation of lightning arresters shall comply with the rules of WAC 296-44-262 through 296-44-271 of the rules for stations, and if the operating voltage of the circuit exceeds 750 volts between conductors, the arresters shall be inaccessible to unqualified persons.

Lightning arresters when installed for the protection of utilization equipment may be installed on supply lines or service leads either within or without the buildings or inclosures containing the equipment to be protected. They shall be installed in accordance with the rules of WAC 296-44-079 through 296-44-667 depending upon their location, whether in stations, on outdoor lines, or with utilization equipment. [§ 35 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-604 Lighting fixtures and signs—Fixtures. (1) **Grounding.** The exposed noncurrent-carrying metal parts of all lighting fixtures, receptacle plates, and switch plates and other similar fixed electric devices shall be effectively grounded when used under the following circumstances (for exception, see WAC 296-44-472(3)):

(a) If in locations where explosives, inflammable gas, or inflammable flyings exist in dangerous quantities.

(b) If within reach of bathtubs, shower baths, plumbing fixtures, steam piping, or other grounded metal surfaces of the building. Metal pull chains used at these locations shall be provided with insulating links. (Usually grounded surfaces within 5 feet horizontally of the parts considered and within 8 feet vertically of the floor are considered within reach.)

(c) If connected to circuits operating in excess of 150 volts to ground, regardless of location.

Exception: Grounding is not required if the fixture, shell of socket lamp guards, etc., are made of or covered with suitable insulating material.

(2) **Polarizing lampholders.** On grounded systems the center contacts of lampholders shall be connected to the ungrounded side of the system, and the inner screw shells of the devices to the grounded side or neutral.

Note: This is in order to reduce the liability of breakdown of the dielectric between the inner screw shell and the grounded outer brass shell, and also to reduce the liability of injury to persons in replacing lamps. This is especially important in wiring electric signs.

[§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-607 Lighting fixtures and signs—Receptacle for convenience outlet. Receptacles installed for the attachment of portable cords shall be of a type not suitable for use with screw-shell-base devices. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-610 Lighting fixtures and signs—Exposed live parts. Electric fixtures, including lamp sockets and lamp bases, if within reach of grounded surfaces, shall be so designed and installed that no current-carrying parts will normally be exposed externally. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-613 Lighting fixtures and signs—Signs. (1) **Accessibility.** Electric signs at an elevation greater than 30 feet above roadways or footways, or at an elevation above a roof greater than the distance from the edge of the roof, shall, if they require attendance while in position, be provided with substantial, safely accessible, runways, ladders, or platforms from which all replacements and other necessary adjustments can be made. Provision for supporting workmen by safety belts should be made in the construction and installation of signs so located.

These provisions do not apply where the sign is so designed and installed that all maintenance is accomplished with external lift type equipment not dependent upon the sign structure for support.

(2) **Inclosure of live parts.** Electric signs outside buildings shall have no ungrounded current-carrying parts normally exposed to contact.

(3) **Grounding of noncurrent-carrying parts.** The exposed noncurrent-carrying metal parts of signs shall be effectively grounded, unless they are insulated from ground and from other conducting surfaces and are inaccessible to unauthorized persons. This does not apply to signs of the portable incandescent lamp type.

(4) **Control.** Electric signs, other than the portable type, shall be provided with switches arranged to entirely disconnect all ungrounded supply wires of the sign, and either located within sight of the sign or arranged so that they can be locked in the open position. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-616 Lighting fixtures and signs—Connectors for signs. Electric signs with changeable

connections shall be so arranged that the connections can be changed manually only by approved connectors. Approved connectors shall interrupt all ungrounded conductors of the circuit. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-619 Lighting fixtures and signs—Lamps in series circuits. (1) **In or on buildings.** Series lamps mounted in building or on external walls of building shall be installed only by permission of the division of safety, department of labor and industries and the local code enforcing authority.

(2) **Elevation.** Arc and incandescent lamps and other devices in series circuits, except in grounded circuits of which no part exceeds 150 volts to ground, shall be effectively isolated or suitably guarded.

Note: Isolation will ordinarily be deemed sufficient when a vertical clearance of 8 feet is provided from floors or other ordinarily accessible places within buildings, of 10 feet from footways outside buildings, and of 15 feet from roadways. Horizontal clearance from windows, porches, and other spaces accessible to the general public should be not less than 3 feet.

(3) **Suspension of lamps.** Lamps shall be securely supported, and the hanger, rope, chain, or other means of support shall be regularly and systematically inspected. All metal cable or chain supports for lamps shall be effectively insulated from the lamp or shall be permanently grounded. Metal chains or metal cables and other conducting parts used for lowering lamps in series circuits shall be grounded or interrupted by a suitable strain insulator, the minimum height of which from the floor or ground shall be 8 feet, whether the lamp is in position or lowered. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-622 Lighting fixtures and signs—Safe access to arc lamps. A suitable device shall be provided by which each arc lamp or other device on series circuits may be safely and entirely disconnected from the circuit before it is handled, unless the lamps are accessible only to properly qualified persons, worked on only from suitable insulating stools, platforms, or tower wagons, and treated always as under the full voltage of the circuit concerned. [§ 36 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-625 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Insulation. Portable appliances and devices shall be provided with an adequate dielectric (complying with the standardization rules of the American Institute of Electrical Engineers) interposed between ungrounded current-carrying parts and those external surfaces which persons can touch.

Exception: Toasters, grills, or other heating appliances in which the current-carrying parts at high temperature are necessarily exposed are exempted. (WAC 296-44-592.)

In locations where the dielectric is exposed to mechanical injury it shall be suitably protected. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-628 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Grounding of frames. Grounding noncurrent-carrying metal parts. Portable appliances and devices operating on circuits of more than 150 volts to ground, shall have their exposed metal frames grounded except (1) motors, if guarded. The exposed metal frames of portable appliances and devices used in hazardous locations as listed in WAC 296-44-481(1), shall be effectively grounded, regardless of the voltage of the circuit. The effective grounding of exposed metal frames of portable appliances and devices (especially when used in locations such as bathrooms, laundries, etc., under conditions where persons may easily touch grounded surfaces at the same time as the appliance or device) is recommended.

Note: Such grounding may be obtained by the use of a three-wire portable cord with the portable appliance or device, one wire being used for the grounding conductor and the connectors being properly designed so that wrong connections cannot be made by the user of the device. Safety may be accomplished and the need for grounding eliminated in many cases by insulating the metal frame from contact by persons, or by isolation of the device.

It is recommended that in industrial establishments portable lamps which are to be used in conductive locations, be operated at 32 volts or less between conductors through the use of step-down transformers, thus obviating the need for grounding such portable equipment. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-631 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Cable connectors. (1) **Break all conductors.** Where used with portable conductors, it is recommended that connectors be used which necessarily disconnect both or all poles from the live source of energy when the circuit is opened.

(2) **Design of connectors.** Connectors shall be so constructed (with guards when necessary) that the person using them cannot inadvertently come in contact with live parts, or be burned by arcing when interrupting the largest current for which they are rated or marked.

Separable connectors should be so designed that the plugs will not fit receptacles rated for larger currents than the plugs.

(3) **Live parts of connectors.** The end of a separable connector which is left alive, or the two ends of a separable connector where both are connected to live circuits (as in battery charging), shall have live parts suitably guarded.

(4) **Strain relief.** Where connectors are attached to portable cables, suitable means shall be provided for relieving the terminal connections of cable from strains. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-634 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Identified conductors, cords, and connectors. (1) **Portable appliances and devices.** Where portable appliances and devices have cases designed to be grounded and the connecting cable is provided with a separate grounding conductor for this purpose (see WAC 296-44-628), such grounding conductor and the corresponding parts of connectors shall have suitable identification, so that the grounding conductor in fixed wiring and portable cable will always be connected to the proper terminals of the connectors. Identification of an equipment grounding conductor of a portable cable may be the absence of insulating covering, but if an individual covering is provided for this conductor it shall be finished to show a green color.

Note: If portable cable containing a conductor identified as provided above is not available, the identifying color may be applied to one of the insulated conductors of the cable where the conductor is exposed at terminals.

(2) **Separable connectors.** Separable connectors shall be so constructed that wrong connection between the two parts is impossible. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-637 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Use of portables and pendants. (1) **Voltage limit of portables.** Portable and pendant conductors shall not be installed or used on circuits operating at more than 300 volts to ground, unless they are accessible only to qualified persons. In such cases they shall be of a type suited to the voltage and conditions.

In car houses and similar locations where service at low voltage is not available and where necessary to use low-voltage pendant or portable lamps or other equipment in series with lamps on trolley circuits, the equipment should be used only with great caution and be placed preferably on the grounded side of the circuit concerned.

(2) **Use of fixed receptacles for portables.** Where portable conductors are required, fixed receptacles shall be provided at safely accessible points. (See WAC 296-44-607.)

(3) **Hazardous locations.** Where exposed to dampness or corrosive influences, portable conductors shall be of a type specially suited, and where exposed to inflammable gas or flyings, they shall be so protected or isolated by elevation that they cannot be readily damaged. In the latter case connectors shall be so arranged as not to be exposed to accidental opening by persons handling the portable conductors or devices. Portable lamps in locations where explosives or inflammable gases are normally present shall be incased in vapor-proof globes with suitable mechanical guards.

Portable lamps in damp places shall be equipped with socket and approved handle of nonabsorptive insulating material, gasket guard, and approved cord.

(4) **Strain relief.** Portable and pendent conductors shall be so installed that no strain is placed on the terminal connections and shall have no joints except at suitable fittings.

(5) **Worn and defective portables.** The use of worn or defective portable and pendent conductors should be avoided because of the danger to users by wire strands piercing the insulation or becoming exposed through abrasion of the covering. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-640 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Portable outdoor equipment of more than 750 volts between conductors. (1) **Scope.** This rule is intended to apply to equipment supplied through portable cable and used for such outdoor surface work as well-drilling, strip mining, quarrying, dredging, shoveling, and log sawing.

(2) **Cables.**

(a) **Insulation.** Cables, wiring, and electric equipment shall be insulated for not less than line-to-line voltage.

(b) **Trailing cables.**

(i) Trailing cables used for connecting an electric supply to mining machines, dredges, shovels, and similar equipment shall be of sturdy construction and suitable for the intended service.

(ii) It is recommended that trailing cables be in continuous lengths. If splices are made they should be equivalent mechanically and electrically to the cable in which they are made.

(iii) The individual conductors of trailing cables shall be so connected to equipment and to the source of supply as to give solid and firm connections without injury to the cable and so that the cables cannot be inadvertently disconnected. Such connections shall be weatherproof and there shall be no exposed current-carrying parts.

(3) **Relays.** Each complete metallic circuit (not separated by insulation as in transformers) shall be equipped with a relay which shall operate on occurrence of ground fault on the circuit to deenergize the faulty circuit or equipment.

(4) **Grounding.** Machinery frames shall be effectively grounded in the manner required by WAC 296-44-058 through 296-44-076.

(5) **Impedors.** If it is desired to provide protection during the interval of time the fault current exists, the use of an impedor connected between the transformer secondary neutral and the grounding point is recommended. The value of this impedor should be such that the voltage which may occur between the machinery frame and ground will not exceed 100 volts. [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-643 Portable appliances, cables and connectors, and insect eliminators (not including those for communication systems)—Insect eliminators. Electric insect eliminators shall be of such low current output as not be a hazard to persons or property, or they shall be installed and guarded or isolated in accordance with

WAC 296-44-469(3) and 296-44-478(1). [§ 37 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-646 Electrically operated industrial locomotives, cars, cranes, hoists, and elevators—Guarding live and moving parts. (1) **Guarding and isolation.** All current-carrying parts accessible to unqualified persons which are connected to circuits of more than 150 volts to ground shall be so isolated or guarded that no person can inadvertently come in contact with them.

(2) **Conductors.** All conductors of more than 150 volts to ground in locations accessible to the public shall be run in conduit, suitable cable, metal molding, or flameproof and waterproof nonmetallic ducts the exposed metallic parts of which shall be effectively grounded.

(3) **Elevators hoistways.** Electric conductors installed in or under an elevator or counterweight hoistway shall, except for flexible cables connecting the car with the fixed wiring, be incased in metal conduits or suitable cable and shall be securely fastened to the hoistway. No electrical conduit or cable, except such as is used to furnish or control power, light, heat, or signals for the elevator or hoistway, shall have any opening, terminal, outlet, or junction within the hoistway, but shall be continuous between outlets or terminals situated entirely outside the hoistway.

Note: It is not intended to prohibit the interruption of long runs for the purpose of supporting or pulling in conductors, and pull boxes may be installed for this purpose.

All live parts of electric apparatus in elevator hoistways shall be protected against accidental contact by suitable inclosing casings or coverings, and all such casings or coverings which are made of metal shall be effectively grounded.

No part of any electric circuit having a rated system or circuit voltage in excess of 750 volts dc or 550 volts ac shall be used for any control or operating circuit. No signaling push buttons shall be used in circuits of more than 300 volts to ground. Circuits of higher rated system or circuit voltage may, however, be used in machine rooms or penthouses for the operation of motors, provided that all operating and signal wiring is thoroughly insulated from such power circuits and all machine frames and handropes are effectively grounded.

The maximum system or circuit voltage permitted in the operating devices of automatic-operation elevators having operating devices in the car and at landings shall be 300 volts to ground.

(4) **Material for guards.** Guards required by WAC 296-44-478 and subsection (1) of this section for the current-carrying parts of unisolated electric equipment, such as controllers, motors, transformers, fuses, circuit-breakers, switches, and other devices, shall consist of cabinets, casings, or shields of effectively grounded metal or of substantial insulating material, or of a combination of the two. All metallic parts, such as conduits, apparatus cases, etc., which are liable to become charged shall be effectively grounded when so located that unqualified persons may come in contact with them.

(5) **Apparatus insulated and grounded.** On passenger cars, apparatus, such as air-compressor motors, having insulated nongrounded mountings, shall be located where passengers are not liable to come in contact with them, as on the exterior of the car body. The air lines from nongrounded air compressors shall be provided with insulating joints in the line, insulating joints to be located in a substantially vertical pipe run in such a manner as to insulate from the motor all pipe or exposed apparatus with which passengers or crew may come in contact. Such pipe and apparatus shall be grounded.

(6) **Collector wires and third rail.** Except on fenced right-of-way or other locations to which only qualified persons are admitted, trolley or crane collector wires and third rails, whether indoors or out, shall be so isolated by elevation (see WAC 296-44-112 and 296-44-310 through 296-44-337) or be provided with suitable guards so arranged that persons cannot inadvertently touch the current-carrying parts while in contact with the ground or with conducting material connected to the ground.

At locations where unqualified persons are especially exposed to possible contact, warning signs shall be provided.

Trolley-contact conductors, indoors, shall be so supported that, in case of a single break, the lower end of the broken wire will not come within 8 feet of the floor.

Note: Damp wood, concrete floors, and metal parts of crane cabs are considered as connected to ground.

(7) **Arcing or suddenly moving parts.** All such parts of electric equipment, including fuses and the handles and arc chutes of circuit-breakers, shall be so isolated or guarded that the liability of persons being struck or burned by sparking, flashing, or movement during operation, is avoided.

(8) **Removable headlights.** Headlight frames shall not be used as conductors and portable headlights shall be wired for double plug connections. All coupler connections shall be so designed and wired that when the coupler is pulled apart there will be no exposed live parts. [§ 38 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-649 Electrically operated industrial locomotives, cars, cranes, hoists, and elevators—Grounding noncurrent-carrying parts. (1) **Frames.** All noncurrent-carrying metal parts of electric equipment shall be effectively grounded or protected by effectively grounded guards or covers. In electric cars all steam or hot-water heating devices accessible to the public shall also be grounded.

Note: The ground connection through well-bonded track rails will be considered satisfactory for equipment on cars and cranes.

(2) **Portable equipment.** 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 (see WAC 296-44-058 through 296-44-076), where operated in the vicinity of supply lines of more

than 150 volts to ground, whether the cranes or similar equipment are themselves electrically operated or not.

On the booms of cranes and derricks mounted on the tracks of railways with overhead trolley-contact conductors, an insulated barrier should be provided which will prevent contact of conducting parts with the overhead wire if the boom is raised against it.

(3) **Guarding parts on car roofs.** Metal parts of car which extend above the car roof (such as whistles or smoke pipes, heater expansion tanks, and metal ventilators) shall either be grounded or insulated or guarded by substantial guards or screens insulated from ground.

If insulated, the insulating joint shall be located immediately below the car roof. Insulating joints in air pipes shall be installed in a substantially vertical run of pipe. [§ 38 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-652 Electrically operated industrial locomotives, cars, cranes, hoists, and elevators—Control of energy supply to cars, cranes, and industrial locomotives. (1) **Disconnecting means.** Readily accessible means shall be provided whereby all conductors and equipment, except lightning arresters, located in or on industrial locomotives, cars, or cranes, can be disconnected entirely from the source of energy at a point as near as possible to the trolley or other current collectors; except on such equipments where the current collectors can be readily removed from the trolley or third rail.

(2) **Main switch or circuit-breaker.** A circuit-breaker or switch, capable of interrupting the circuit under heavy loads, and readily controlled by the operator, shall be provided, unless the current collectors can be safely removed, under heavy loads, from the trolley or third rail.

(3) **Disconnecter for third-rail collector.** Where current supply is from two sources (such as overhead trolley and third rail) disconnecting switches shall be provided as follows:

(a) On a public right-of-way, a double-throw switch shall be provided in current-collector cable so arranged that when current supply is from either source, the current-collector cable from the other source is disconnected.

(b) On a private right-of-way, a single-throw switch shall be provided in cable to third-rail collectors so that these may be deenergized when the current supply is from the overhead trolley. [§ 38 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-655 Control of movement of industrial locomotives, cars, cranes, and elevators. (1) **Locking or removable handles.** Means shall be provided whereby the operator (whether motorman or elevator attendant) can prevent the starting of the equipment by unauthorized persons while he is absent from his post.

Note: Removable reverse levers or controller handles and locked doors to the operator's cab or elevator hoist-way are among the most effective means.

(2) **Location of controllers.** The car control lever of passenger elevators should be located so that the operator can readily face the principal car opening. For cars

and traveling cranes, the car control should be so located that the operator can readily see in the direction of travel.

It is recommended that the control levers of traveling cranes be located in the same relative position each to the other in all the cages of cranes.

(3) **Limit switch.** A limit switch shall be provided for the upper limit of travel of crane hoists and for both upper and lower limits of travel for elevators. Limit switches shall be at least 4 feet above lowest floor level in garages and other buildings where inflammable gases may be present.

(4) **Reverse-phase relays.** Polyphase alternating-current motors operating freight or passenger elevators or cranes that are dependent upon phase relation for their direction of rotation shall be provided with a device such as a relay, which will prevent starting any motor if the phase rotation is in the wrong direction. In the case of cranes this device may be inserted ahead of the runway feeders.

Exception is made in the case of a control having an operating device for the reversing switches which automatically changes its direction of operation when a change in phase rotation is made in the power circuit. [§ 38 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-658 Control of movement of industrial locomotives, cars, cranes, and elevators—Subway and car lighting. Subways and similar locations used for passenger transportation where artificial illumination is indispensable shall be lighted throughout their entire length by a system independent of the current for electric traction where such is used. It is recommended that passenger cars operated in such locations and lighted normally from the railway circuit shall be equipped with an auxiliary system of emergency lighting. [§ 38 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-661 Telephone and other communication apparatus on circuits exposed to supply lines or lightning—Protective requirements. (1) **General requirements.** Where telephone or other communication apparatus (not included under (2) below) which must be handled by persons is permanently connected (not including portable telephones) to overhead communication circuits exposed to either lightning, supply lines of more than 400 volts to ground, or induction of more than 150 volts between terminals of the communication equipment and ground from supply circuits under normal conditions, provisions against shock to persons handling apparatus, shall be made by one of the following methods:

(a) The use of suitable protective devices such as fuses and arresters operating at 750 volts to ground and, for conditions of unusual exposure, additional devices such as auxiliary arresters, neutralizing transformers, drainage coils or insulating transformers.

(b) The grounding of all exposed noncurrent-carrying metal parts and the suitable guarding of all ungrounded current-carrying parts. (See WAC 296-44-664.)

(c) The arrangement of apparatus in such a way that persons using it will be obliged to stand on a suitably

insulated platform in a suitably insulated booth, or on other insulating surfaces. (This method may be used only where apparatus is accessible to none but authorized persons.)

(2) **Fire and police alarm boxes.** Such signaling devices as fire and police alarm and associated test boxes, if connected to overhead communication circuits exposed to lightning or to supply lines of more than 400 volts to ground, should have the accessible noncurrent-carrying metal parts effectively grounded wherever the character of service gives valid objection to the use of arresters or transformers on the signal circuit.

Fire alarm boxes connected to overhead circuits, if not protected by arresters, should be provided with suitable insulating material between the circuit within and the exposed frame and operating hook, this insulation to be capable of withstanding the highest voltage of the supply circuits to which the fire alarm circuit is exposed up to 7,500 volts.

Police alarm boxes, where connected to overhead police alarm circuits, should be protected by arresters, operating at not more than 750 volts, placed in the connecting leads outside the box. [§ 39 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-664 Telephone and other communication apparatus on circuits exposed to supply lines or lightning—Guarding current-carrying parts. (1) **Current-carrying parts.** Telephone or other communication apparatus which is permanently located outdoors or where exposed to corrosive fumes or dampness (such as may occur in subways, cellars, basements, laundries, stables, etc.) shall be so arranged that all ungrounded current-carrying parts are so guarded as to be suitably protected against the prevailing atmospheric conditions.

The inclosing cases of communication apparatus provide suitable guards if substantially built of metal or insulating material.

(2) **Receiver cords.** Receiver cords where required to be guarded shall be guarded by shields of effectively grounded metal (such as metal armor) or of nonabsorptive insulating material (such as flexible insulating tubing) or suitable insulating coverings for the individual conductors. (See WAC 296-44-661(1)(b).)

(3) **Shields for portable cords.** Where no protective device is installed the shields of portable cords shall always be of grounded metal or of special insulating material suitable to withstand the voltage of the highest-voltage supply circuit to which the communication circuit is exposed up to 7,500 volts. [§ 39 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-667 Telephone and other communication apparatus on circuits exposed to supply lines or lightning—Grounding. The ground connections for outside installations of cable protectors employed solely to prevent electrical damage to the cable need not conform with the requirements of this rule.

(1) **Methods.** Arresters and, where required, exposed noncurrent-carrying metal parts shall be grounded in the following manner:

(a) The grounding conductor shall preferably be of copper (or other material which will not corrode excessively under the prevailing conditions of use) and shall be not less than No. 18 (0.040 inch) in size, and where within buildings shall be covered with a suitable insulation.

If necessary to guard the grounding conductor from mechanical damage (on poles or where a grounding conductor on the outside of building walls is near a roadway, sidewalk, or pathways, thus exposing it to tampering by unauthorized persons), it shall be protected for a distance of 8 feet from the ground by a wooden molding or by conduit of nonmagnetic material.

(b) The grounding conductor shall preferably be connected to a cold-water pipe. In the absence of a water pipe, connection may be made to a continuous underground metallic gas-piping system, to metallic structures when effectively grounded, or to a ground rod or pipe driven into permanently damp earth. If a gas-pipe electrode is used, connection shall be made between the gas meter and the street main. Steam or hot-water pipes should not be used for ground connections. Driven rods or driven pipes used as ground connections for protectors shall not be also used as ground connections for electric-supply circuits or electric apparatus. The requirement of separate driven rods or pipes for protectors and for electric supply circuit grounding, or the use of other separate grounds, does not prohibit bonding together such grounds where such bonding seems desirable. Where water or gas pipes are used for a ground connection, attachment to such pipes shall not be made at the same point as attachments to electric-supply circuits or equipment.

(2) **Connecting grounding conductor or pipes.** Grounding conductors shall be attached to pipes by means of suitable ground clamps; the entire surface of the pipe to be covered by the clamp shall be thoroughly cleaned.

(3) **Connecting grounding conductors to driven rod or pipe or other metallic structure.** Grounding conductors shall be so attached to the rod, pipe or metallic structure as to give reliable connection, both mechanically and electrically, and in such a manner as to prevent excessive corrosion when the joint is buried in the earth. [§ 39 (part), filed 3/23/60, effective 12/1/58.]

RADIO AND T.V. INSTALLATIONS

WAC 296-44-670 Rules for radio and T.V. installations—Scope. The rules of WAC 296-44-670 through 296-44-766 apply to radio-transmitting and receiving installations, including antennas, counterpoise wires, lead-in conductors, grounding conductors, grounding connections, protective devices, and batteries. The rules do not apply to mobile or portable installations of any type, nor to equipment and coupling wires used for coupling carrier-current equipment to supply-line conductors. In case the installation is covered by more than one rule, the superior requirement shall apply.

Community television antenna and distribution systems shall conform to construction and clearance requirements for communications cables and/or wires as provided for in other parts of the code.

The term "Radio stations" shall include television station transmitter, receiver, their antennas and distribution systems. [§ 50, filed 3/23/60, effective 12/1/58.]

WAC 296-44-673 Classification of radio stations. For the purpose of these rules, radio stations are classified as follows: (1) **Receiving stations.**

(2) **Transmitting stations.** The power rating of transmitter shall be the rating authorized by the federal communications commission or other authorized federal regulatory body in granting construction permits and licenses. For the purpose of this code, transmitting stations are divided into three groups as follows:

(a) **Low power.** Transmitting stations having a licensed operating power less than 100 watts output and a maximum plate supply voltage (dc or rms ac) less than 750 volts.

(b) **Medium power.** Transmitting stations not classified as low power or high power.

(c) **High power.** Transmitting stations having a licensed operating power output greater than 1,000 watts or a maximum plate supply voltage (dc or rms ac) greater than 5,000 volts.

Note: In the case of amateur stations, the classification under these rules shall be determined by the voltage used on the plate of the last tube of the transmitter.

[§ 51, filed 3/23/60, effective 12/1/58.]

WAC 296-44-676 Antenna and counterpoise installation—Application of rules. These rules apply as follows: (1) **Outdoor antennas of all classes of stations (as defined in WAC 296-44-673(1) and (2)).** There are no requirements for indoor antennas, except that they shall meet the requirements for clearance from the conductors of other systems specified in WAC 296-44-706(3). In general, transmitting antennas should not be located indoors.

(2) **Counterpoise wires.**

(3) **Ground-system wires.** There are no requirements for the ground-system wires of an antenna. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-679 Antenna and counterpoise installation—General requirements. (1) **Antennas.**

(a) **Antennas of receiving stations.** Such antennas shall comply with the requirements for the construction of communication lines for public use in similar situations, as given in WAC 296-44-274 through 296-44-457.

(b) **Antennas of transmitting stations.** Such antennas shall comply with the requirements for the construction of supply lines for public use in comparable situations and for the voltage concerned, as given in WAC 296-44-274 through 296-44-457.

(2) **Counterpoise wires.** Counterpoise construction shall conform to the requirements for that of the associated antenna as regards location and clearances with respect to conductors of other systems. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-682 Antenna and counterpoise installation—Locations to be avoided. (1) **Medium and high-power transmitting stations.** The following situations shall be avoided in erecting the antenna, counterpoise, and guy-wire systems of medium and high-power transmitting stations:

(a) Attachment of any wires of the systems to poles which carry the conductors of any electric supply or communication circuits.

(b) Crossings (above or below) or conflicts of any of the wires of the systems with the conductors of any electric supply or communication circuits.

(c) Crossing over streets, highways, or the tracks of any railroad.

(2) Receiving and low-power transmitting stations.

(a) In relation to circuits of more than 250 volts—The following situations shall be avoided in erecting the antenna, counterpoise, and guy-wire systems of receiving and low-power transmitting stations, except for the equipment of public utilities attached to their own poles:

(i) Attachment of any wires of the systems to poles which carry electric supply or communication circuits of more than 250 volts to ground.

(ii) Crossings (above or below) or conflicts of any of the wires of the systems with the conductors of any electric supply or communication circuits of more than 250 volts to ground.

(b) In relation to circuits of less than 250 volts—The following situations should be avoided whenever possible in erecting the antenna, counterpoise, and guy-wire systems of receiving and low-power transmitting stations, except for the equipment of public utilities attached to their own poles:

(i) Attachment of any wires of the systems to poles carrying the conductors of electric supply or communication circuits, none of which exceeds 250 volts to ground.

(ii) Crossings or conflicts of any wires of the systems with the conductors of any electric supply or communication circuits of less than 250 volts to ground.

(iii) Crossing over streets, highways, or the tracks of any railroad. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-685 Antenna and counterpoise installation—Ordinary construction of antenna systems. If all of the situations listed in WAC 296-44-682 are avoided, antenna systems should be constructed in accordance with this section. If any of the situations of WAC 296-44-682(2)(b), are not avoided, antenna systems shall be constructed in accordance with WAC 296-44-688. (1) **Antenna conductors.**

(a) **Material.** Antenna conductors should be of copper, copper-covered steel, bronze, or other corrosion-resistant material of adequate strength.

(b) **Size.** Antenna conductor sizes should be not less than given in Table 1.

TABLE 1.—Antenna conductor sizes—ordinary construction

Material	Receiving and low-power transmitting			Medium and high-power transmitting		
	Span length			Span length		
	Less than 35 feet	35 to 150 feet	Exceeding 150 feet	Less than 35 feet	35 to 150 feet	Exceeding 150 feet
	AWG No.	AWG No.	AWG No.	AWG No.	AWG No.	AWG No.
Copper:						
Soft-drawn	19	14	8	14	7	—
Medium-drawn	19	14	10	14	8	—
Hard-drawn	19	14	12	14	10	8
Bronze, copper-covered steel, or other high-strength, corrosion-resistant material . . .	19	14	14	14	12	10

(c) **Strength.** The conductor sizes listed in Table 1 provide for minimum strength without loading. In localities subject to glaze, ice, sleet, or snowstorms, comprised in the heavy- and medium-loading districts, additional strength should be provided. (See WAC 296-44-352.) In determining the loading, the effect of lead-in conductors and the loading thereon should be included.

(2) Antenna insulators.

(a) **Material.** Insulators should be of noncombustible material.

(b) **Dielectric strength.**

(i) **Receiving and low-power transmitting stations.** No requirements.

(ii) **Medium and high-power transmitting stations.** Insulators should meet the requirements of WAC 296-44-385 for the voltage developed on the antenna at the points of insulator attachment.

(c) **Mechanical strength.** Insulators should have a breaking strength not less than that of the smallest conductor which would be permitted by Table 1.

(3) Antenna supports.

(a) **Strength of supports.** All supporting structures should be so constructed as to carry the vertical, longitudinal, and transverse loads. They should be so erected that they are not dependent in general on the antenna for stability. Guys or braces may be used to obtain the necessary strength to withstand the longitudinal and transverse loads. Where the stability of the support is solely dependent on the guys, these should be led out in at least three approximately equally spaced directions from the support. In determining the loads, the storm-loading map given with WAC 296-44-352 should be employed; also the effect of the lead-in conductors and the load thereon should be included.

Exception: If ice-melting arrangements are regularly utilized, ice loading may be disregarded.

(b) **Guys.** Guys should be of galvanized steel, copper covered steel, bronze or other corrosion-resistant material and should be of adequate size, and in any case not less than the equivalent of No. 14 AWG solid wire.

They should be firmly attached to adequate anchors or to structures which will furnish a substantial anchorage. Where guys may be exposed to mechanical damage they should be provided with guards. Guys associated with antennas of transmitting stations where accessible to unauthorized persons shall be grounded or contain insulators complying with WAC 296-44-409.

(c) Roof supports. Antenna supports erected on roofs should be of substantial construction and, where necessary, shall be arranged to distribute the load over the roof.

(d) Chimneys. The attachment of antennas or antenna supports to chimneys shall be avoided where such attachment might overload the chimney.

(e) Grounding metal supports on roofs. Metal supporting poles or masts extending more than 10 feet above the supporting building shall be permanently and effectively grounded in conformance with the requirements of WAC 296-44-730 through 296-44-739, except poles or masts which themselves are used as antennas.

(f) Trees. Where antennas or guys are attached to trees, the location and method of attachment shall be such that swaying of the tree in the wind will not cause undue stress in the antenna conductors.

(4) **Strength of attachment of antennas to supports.** The means used for attaching the antenna to the support shall be such as to withstand a load that will break the conductor itself. The use of a strain hook which will release the wire before it breaks is permissible if the circumstances of a particular installation warrant it.

(5) Minimum clearance above ground and roofs.

(a) Spans 150 feet or less in length. Antenna conductors in approximately horizontal spans shall have clearances above ground and roofs not less than given in Table 2. These clearances do not apply to vertical antennas or vertical leadins.

TABLE 2.—Minimum antenna clearances above ground or roof

Location	Receiving and low-power antennas Feet	Medium and high-power antennas Feet
Above roofs	8	8
Along road in rural districts	15	28
Above streets and roadways	18	28
Above roadways to residence garages	10	12
Above spaces or ways normally accessible to pedestrians only	10	12

(b) Spans exceeding 150 feet in length. For such spans the above clearances shall be increased by 0.1 foot for each 10 feet in excess of 150 feet. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-688 Antenna and counterpoise installation—Special construction of antenna systems. Where any of the situations of WAC 296-44-682(2)(b)(i), (ii), and (iii), are not avoided, the construction shall meet such of the following rules as may

apply: (1) **Recommendation against locating antennas in situations where special construction is required.** It is strongly recommended that the installation of antennas in these special situations be avoided.

Note: If such locations are employed, it must be recognized that special hazards are introduced and that great care is necessary in the construction and maintenance of antennas to avoid contact with supply or communication conductors and to avoid the reduction of clearance over highways or railroad tracks.

(2) **Attachment to poles carrying conductors of electric supply or communication circuits of less than 250 volts to ground.** The attachment to such poles shall be made in such a manner and at such a location on the pole as not to interfere with the operation or maintenance of the electric supply or communication circuits, and to provide a clearance of at least 40 inches below the conductors and equipment of the electric supply or communication circuits. The antenna conductor, counterpoise, or guy wires preferably should be attached below the foreign circuit attachments.

Exception: These requirements do not apply in the case of outdoor installations of radio equipment and antennas where the electric supply or communication circuits terminate in the radio equipment.

(3) **Crossings over or conflicts with electric supply or communication circuits of less than 250 volts to ground.** In such locations the antenna conductors, counterpoise, or guy wires shall be constructed in accordance with the provisions of WAC 296-44-685, and, in addition, a clearance of 6 feet shall be maintained at the crossing or throughout the conflicting section.

(4) **Crossings under electric supply or communication circuits of less than 250 volts to ground.** In such locations the antenna conductors, counterpoise, or guy wires shall be constructed in accordance with the provisions of WAC 296-44-685, and, in addition, they shall be so constructed as to insure the maintenance of at least 2 feet from a communication conductor and of 4 feet from an electric supply conductor.

Note: It should be noted that for relatively long spans on the electric supply or communication circuit, the increase in sag with ice and wind loading is considerably more than for short spans, and allowances should be made accordingly when determining the clearance under fair-weather conditions.

(5) **Crossings over streets, highways, or railway tracks.** In such locations the antenna conductors, counterpoise, or guy wires shall be constructed in accordance with the provisions of WAC 296-44-685 and, in addition, shall meet the requirements of WAC 296-44-274 through 296-44-457 for the strength and sag of conductors, strength of supports, and clearance above the roadway applicable to communication lines in such locations. Where the requirements of WAC 296-44-685 differ from those of WAC 296-44-274 through 296-44-457, the requirements of WAC 296-44-274 through 296-44-457 shall control. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-691 Antenna and counterpoise installation—Guarding of antennas. Antennas for transmitting stations except those of the shunt-excited, grounded-base type shall be installed so as not to be readily accessible to unauthorized persons. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-694 Antenna and counterpoise installation—Supply circuits as antennas or grounds. Electric supply circuits shall not be employed as receiving antennas or as operating grounds through a conductive connection. They may be so used if suitable capacitors having a dielectric strength sufficient to withstand seven times the normal supply-circuit voltage and a capacitance of not more than 0.1 microfarad are inserted between the apparatus and each wire of the supply circuit. [§ 52 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-697 Lead-in conductors—Application of rules. The requirements of this section apply to lead-in conductors (including radio-frequency transmission lines) of receiving stations and low-power transmitting stations. Lead-in conductors of medium and high power transmitting stations shall meet such of the requirements of WAC 296-44-079 through 296-44-271, supply stations, as apply for the voltages concerned. [§ 53 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-700 Lead-in conductors—Material. Lead-in conductors shall be of copper, bronze, copper-covered steel, or other corrosion-resistant material. [§ 53 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-703 Lead-in conductors—Size. The size of the lead-in conductor should not be less than that specified in Table 1, the span length being taken as the distance from the point of attachment to the antenna to the first building attachment. Where the lead-in conductors are attached to intermediate supports, the maximum span shall be considered. [§ 53 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-706 Lead-in conductors—Installation of lead-in conductor. (1) **From antenna to first building attachment.** This section of the lead-in wire shall conform to the requirements as specified in WAC 296-44-680 and 296-44-688 for antennas similarly located.

(2) **From first building attachment to building entrance.** This section of the lead-in conductor shall be installed and maintained so that it cannot swing closer to the open conductors of communication supply, or lightning-rod systems than the following distances.

Communication or supply circuits of 0 to 750 volts	2 feet
Supply circuits exceeding 750 volts	10 feet
Lightning-rod systems	6 feet

Exception: The 2-foot clearance from communication or supply circuits of less than 750 volts may be reduced to not less than 4 inches if the lead-in conductor is separated from other conductors by a continuous and firmly

fixed nonconductor which will maintain permanent separation. This nonconductor shall be in addition to any insulating covering on the wires.

Lead-in conductors of low-power transmitting stations shall be firmly mounted on insulating supports so as to clear by at least 3 inches the surface of the building. If the lead-in has an effectively grounded metal sheath, it may be attached directly to the surface and treated as a grounding conductor with respect to clearance and other requirements.

(3) **From building entrance to set.**

(a) Receiving stations.

(i) Lead-in conductors shall be securely fastened in a workman-like manner.

(ii) Clearance between lead-in conductor and any supply conductor not in conduit shall not be less than 4 inches.

Exception 1: This 4-inch clearance does not apply if a firmly fixed nonconductor such as a porcelain tube affords a permanent separation. This nonconductor shall be in addition to any insulating covering on the wires.

Exception 2: This 4-inch clearance does not apply where the lead-in terminates in an outlet box which is also occupied by the conductors of another system, provided such outlet box is equipped with a barrier of sheet steel not less than No. 16 U.S. Standard Gage or a barrier of fire-resistant insulating material rigidly fastened to the box or its cover, or other device which assures positive separation between the lead-in conductors and the conductors of the other system.

(b) Low-power transmitting stations.

(i) Lead-in conductors shall be securely fastened to suitable insulators which provide a clearance of at least 2 inches to the nearest surface.

(ii) Clearance between lead-in conductor and any supply wire shall be at least 4 inches.

(iii) Lead-in conductors shall be installed and protected to prevent persons from readily coming into accidental contact with them.

Exception: If the lead-in has an effectively grounded metal sheath, it may be treated as a grounding conductor and attached directly to any surface.

[§ 53 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-709 Construction at building entrance—Application of rules. The requirements of this section apply to construction at receiving stations and low-power transmitting stations. Construction at building entrance of medium- and high-power transmitting stations shall meet such of the requirements of WAC 296-44-079 through 296-44-271, supply stations, as may apply for the voltage concerned. [§ 54 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-712 Construction at building entrance—Entrance. (1) **Receiving stations.** Lead-in conductors for receiving stations shall be either insulated or surrounded by a grounded metallic sheath where they enter the building.

(2) **Low-power transmitting stations.** Lead-in conductors for low-power transmitting stations, where not installed with a grounded metallic sheath, shall enter the building by one of the following methods:

(a) through a rigid, noncombustible, nonabsorptive insulating tube or bushing;

(b) through a drilled window pane; and

(c) through an opening provided for the purpose in which the entrance conductors are firmly secured so as to provide a clearance of at least 2 inches. If the lead-in conductor is inclosed in an effectively grounded metal sheath, no further insulation is necessary. [§ 54 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-715 Construction at building entrance—Creepage and air-gap distance. The entrance bushing or window pane mentioned in WAC 296-44-712 shall, in the case of low-power transmitting stations, afford a creepage and air-gap distance from extraneous bodies of not less than 2 inches. There is no requirement under this title for receiving stations. [§ 54 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-718 Construction at building entrance—Mechanical protection of bushings. Entrance bushings of porcelain or other fragile material at low-power transmitting stations shall be protected where exposed to mechanical injury. [§ 54 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-721 Protective devices—Application of rules. The requirements of this section apply to protective devices for receiving stations and low-power transmitting stations. Protective devices for medium and high-power stations shall meet such of the requirements of WAC 296-44-079 through 296-44-271, supply stations, as may apply for the voltages concerned. [§ 55 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-724 Protective devices—Receiving stations. (1) **Lightning arrester.** Each lead-in conductor of a receiving station using an outdoor antenna shall be provided with a lightning arrester which will operate at a voltage of 750 volts or less.

Exception: If the lead-in conductor is protected by a continuous effectively grounded metal sheath, the lightning arrester may be omitted.

(2) **Location.** The lightning arrester may be located outside or inside the building as near as practicable to the point of entrance and convenient to a ground. The arrester shall not be placed in the immediate vicinity of easily ignitable material nor in a location exposed to dust, inflammable gases, or flyings of combustible materials. [§ 55 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-727 Protective devices—Low-power transmitting stations. (1) **Protective device.** Lead-in conductors of low-power transmitting stations shall be equipped with a grounding switch, lightning arrester, horn gap, or other suitable means for lightning protection. If no conducting path between the antenna and

ground is provided in the connected equipment, means shall be provided to drain static charge from the antenna system.

Exception: Where the antenna itself is directly grounded, other forms of protection against lightning and static charge may be omitted.

(2) **Location.** The protective device may be located either outside or inside the building. The device should be placed in the most direct line between the lead-in conductor and the point where the grounding connection is made. The device shall not be placed in the immediate vicinity of easily ignitable material nor in a location exposed to dust, inflammable gases, or flyings of combustible material. [§ 55 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-730 Protective and operating grounding conductors—Application of rules. The requirements of this section apply to grounding conductors of receiving stations and low-power transmitting stations. Grounding conductors of medium and high-power transmitting stations shall meet such requirements of WAC 296-44-058 through 296-44-071, grounding, and WAC 296-44-079 through 296-44-271, supply stations, as apply. [§ 56 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-733 Protective and operating grounding conductors—General. The protective grounding conductor may be used also as the operating grounding conductor. [§ 56 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-736 Protective and operating grounding conductors—Material and size. (1) **Receiving stations.** Material. No requirements.

(a) Operating grounding conductor. No requirements.

(b) Protective grounding conductor. This conductor shall be not smaller than No. 14 AWG. copper and not smaller than the lead-in conductor.

(2) **Low-power transmitting stations.** The operating and protective grounding conductors of low-power transmitting stations shall be not smaller than No. 14 AWG. copper, and not smaller than the lead-in conductor. [§ 56 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-739 Protective and operating grounding conductors—Installation of grounding conductors. (1) **Method of running.**

(a) Grounding conductors shall be run in as straight a line as practicable from the set or the protective device to a good effective ground as specified in WAC 296-44-742 through 296-44-751.

(b) Grounding conductors may be run either inside or outside of the building.

Recommendation: It is recommended that the protective grounding conductor for low-power transmitting stations be run outside of the building.

(2) **Mechanical protection.** Grounding conductors shall be guarded against mechanical injury.

(3) **Insulation.** Grounding conductors may be of insulated or bare wire and need not be run on insulating supports.

(4) **Fuse not to be used.** No fuse shall be included in the circuit between the lightning arrester and the protective ground. [§ 56 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-742 Grounds and ground connections—Application of rules. The requirements of this section apply to protective grounds and ground connections for receiving stations and to operating and protective grounds and ground connections of low-power transmitting stations. There are no requirements for operating grounds or ground connections for receiving stations. Grounds and ground connections for medium and high-power transmitting stations shall meet such requirements of WAC 296-44-058 through 296-44-076, grounding, and WAC 296-44-079 through 296-44-271, supply stations, as apply. [§ 57 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-745 Grounds and ground connections—Grounds. (1) **Cold-water pipes.** Cold-water pipes shall preferably be used for grounds where such pipes are available and are connected or bonded to an extensive underground piping system or to a metallic well casing. An outlet pipe from a water tank fed by a street water main or a driven well may be used provided such outlet pipe is adequately bonded to the inlet pipe connected to the street water main or to the well casing.

(2) **Gas pipes.** In the absence of cold-water pipes, an extensive underground gas piping system may be used provided the grounding-conductor connection is made between the gas meter and the street main.

(3) **Steam and hot-water pipes.** Steam and hot-water pipes shall not be used for grounds.

(4) **Metallic structures.** A metallic structure may be used as a ground, if effectively grounded.

(5) **Artificial grounds.** In the absence of underground piping systems, driven pipes or rods or buried plates may be used. Steel or iron pipes or rods shall be galvanized or copper-coated. [§ 57 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-748 Grounds and ground connections—Attachment to pipes. Grounding conductors shall be attached to pipes by means of suitable ground clamps which will not fail because of corrosion or cause corrosion of the pipe, or by other means which will insure a good mechanical and electrical connection. The entire surface of the pipe to be covered by the clamp shall be thoroughly cleaned. Connections to such pipes shall not be made at the same point as used for grounding electric supply or communication circuits or equipment. [§ 57 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-751 Grounds and ground connections—Attachment to driven pipes, rods, or buried plates. The grounding conductor shall be attached to the rod, buried plate, or other body so as to give a reliable

connection both mechanically and electrically. This connection shall be made so that it will not fail through corrosion even when the joint is buried in the earth. Driven pipes or rods or buried plates used as grounding electrodes shall not be used also as grounding electrodes for electric supply or communication circuits or equipment. This requirement, however, does not prohibit the bonding together of the grounds of these several services where such bonding seems desirable. Where an effective station ground has been established by bonding together a group of such driven pipes or rods or buried plates, connection may be made thereto even though this ground is also used for other services. [§ 57 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-754 Connection to power supply lines—Application of rules. The requirements of this section shall apply to connecting devices for receiving stations and low-power transmitting stations. Connecting devices for medium and high-power transmitting stations shall meet such requirements of WAC 296-44-079 through 296-44-271, supply stations, as may apply. [§ 58 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-757 Connection to power supply lines—Receiving stations and low-power transmitting stations. Devices used in connection with power supply lines and methods of wiring employed at receiving stations and low-power transmitting stations shall be in accordance with the rules covering permanent or portable fixtures, devices, and appliances of WAC 296-44-625 through 296-44-643. [§ 58 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-760 Batteries—Application of rules. The requirements of this section apply to batteries for receiving stations and transmitting stations of low and medium power. Large permanently installed batteries with a nominal voltage in excess of 50 volts, and batteries for high-power transmitting stations shall conform to WAC 296-44-142 through 296-44-166, rules for stations. [§ 59 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-763 Batteries—Care in handling. Care shall be used in handling batteries in order to avoid contact with terminals having a high enough difference of potential to cause shock. [§ 59 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-766 Batteries—Portable batteries. (1) **Ventilation.** Storage batteries shall be located where there is adequate ventilation.

(2) **Precautions.** Smoking, or the use of open flames, or of tools which may generate sparks, should be avoided except when cells are not actively gassing and when prior ventilation has been ample. Sparks from frictional or static electricity should be avoided, as they may ignite the gas if discharged close to its source, as at the vent of a sealed-type cell during overcharging. The electrolyte of storage batteries, and spray containing electrolyte, are somewhat corrosive, particularly when concentrated by

evaporation, and contact with body or clothes should be avoided.

Do not handle live parts of batteries or their connections unless adequate precautions are taken to avoid shock. [§ 59 (part), filed 3/23/60, effective 12/1/58.]

WAC 296-44-850 Pole lines that overbuild or underbuild existing pole lines. No company shall construct a pole line which will overbuild or underbuild the existing pole lines of any company without first giving such company fifteen days' notice in writing or receiving the permission of the company affected: *Provided*, That this rule shall not apply to wires crossing over or under existing wires at an angle in excess of fifteen degrees: *Provided, further*, That this rule shall only apply when either the existing or the proposed line is to be operated at a potential in excess of 5,000 volts. [Rule 34, filed 8/3/61.]

WAC 296-44-855 High potential lines overbuilding telephone, telegraph, or signal wires. Wires or cables carrying electricity at a potential of 750 volts or more, overbuilding telephone, telegraph, or signal wires shall have a minimum size of wire No. 6 B & S gauge annealed copper or its equivalent in strength: *Provided, further*, That this rule shall only apply when either the existing or the proposed line is to be operated at a potential in excess of 5,000 volts. [Rule 35, filed 8/3/61.]

WAC 296-44-860 Crossings over railroads, street railroads, telephone, telegraph, signal or other power lines—General requirements. All wires or cables carrying electric current shall be run, placed, erected and maintained on crossings over railroads, street railroads, telephone, telegraph, signal or other power lines, in accordance with the following specifications: (1) Location: The poles, or towers, shall be located as far as practicable from inflammable material or structures.

(2) The poles, or towers, supporting the crossing span, and the adjoining span on each side preferable shall be in a straight line.

(3) Power wires or cables shall cross above the telegraph, telephone, and similar wires wherever practicable.

(4) Cradles or overhead bridges shall not be used.

(5) Crossing spans shall have a maximum length of 150 feet, except by permission of the commission,* and the difference in length of the crossing and adjoining spans generally shall not be more than fifty percent of the length of the crossing span.

(6) Clearance: Poles shall not be located less than twelve feet from the nearest rail of mainline track, nor less than six feet from the nearest rail of sidings, except by permission of the commission.* At loading sidings sufficient space shall be left for a driveway.

(7) The separation of conductors supported by pin insulators shall not be less than:

Line voltage	Separation
Not exceeding 750 volts	10 inches
Exceeding 750 volts but not exceeding 7,500	12 inches
Exceeding 7,500 volts but not exceeding 15,000	22 inches
Exceeding 15,000 volts but not exceeding 27,000	30 inches
Exceeding 27,000 volts but not exceeding 35,000	36 inches
Exceeding 35,000 volts but not exceeding 47,000	45 inches
Exceeding 47,000 volts but not exceeding 70,000	60 inches

Note 1.—This requirement does not apply to wires of the same phase or polarity between which there is no difference of potential.

Note 2.—The separation of conductors in series arc or incandescent circuits where the potential is not in excess of 10,000 volts need not exceed 12 inches.

(8) When supported by insulators of the disc or suspension type, the wire in the crossing span and the next adjoining spans shall be so attached to the insulators that a break in the span next adjoining the crossing span will not reduce the clearance specified more than twenty-five percent.

*Public service commission abolished. Duties devolve upon director of labor and industries, RCW 43.22.050.

(9) Conductors: The normal mechanical tension in the conductors generally shall be the same in the crossing span and in the adjoining span on each side.

(10) The conductors shall not be spliced in the crossing span, nor in the adjoining span on either side when there are more than two spans between crossings.

(11) The method of supporting the conductors at the poles, or towers, shall be such as to hold the wires, under maximum loading, to the supporting structures, in case of broken insulators, or wires broken or burned at the insulator, without allowing an amount of slip which would materially reduce the clearance specified.

(12) Crossarms: Double crossarms shall be used on the poles or towers supporting crossing spans having a potential in excess of 15,000 volts where the strength of the conductor is less than that of No. 2 B. & S. gauge annealed copper.

(13) Guys: Wooden poles supporting crossing spans having a length of one hundred and twenty-five feet or more, and the next adjoining poles shall be headguyed away from the crossing span in all cases where the potential is in excess of 15,000 volts.

(14) Strain insulators shall not be used in guying steel structures, and are not required on wooden poles if the guy is effectually grounded, except within the incorporated limits of any city or town as provided in RCW 19.29.010(11).

(15) Clearing: The space around the poles, or towers, shall be kept free from inflammable material, underbrush and grass.

(16) Temperature: In the computation of stresses and clearances, and in erection, provision shall be made for a variation in temperature from minus 20 degrees Fahrenheit to plus 120 degrees Fahrenheit. A suitable modification in the temperature requirements shall be made for regions in which the above limits would not fairly represent the extreme range of temperature. [Rule 36, subsections 1-16, filed 8/3/61.]

WAC 296-44-865 Crossings over railroads, street railroads, telephone, telegraph, signal or other power lines—Loads.

(1) The conductors shall be considered as uniformly loaded throughout their length, with a load equal to the resultant of the dead load plus the weight of a layer of ice one-half inch in thickness, and a wind pressure of 8.0 pounds per square foot on the ice-covered diameter, at a temperature of 0 degrees Fahrenheit.

(2) The weight of ice shall be assumed as 57 pounds per cubic foot (0.033 pounds per cubic inch).

(3) Insulators, pins, and conductor attachments shall be designed to withstand, with the designated factor of safety, the tension in the conductors under the maximum loading.

(4) The poles, or towers, shall be designed to withstand, with the designated factor of safety, the combined stress from their own weight, the wind pressure on the pole, or tower, and the above wire loading on the crossing span and the next adjoining span on each side. The wind pressure on the poles, or towers, shall be assumed at 13 pounds per square foot on the projected area of solid or close structures, and on one and one-half times the projected area of latticed structures.

(5) The poles, or towers, shall also be designed to withstand the loads specified in subsection (4) above combined with the unbalanced tension of:

2 broken wires for poles, or towers, carrying 5 wires or less.

3 broken wires for poles, or towers, carrying 6 to 10 wires.

4 broken wires for poles, or towers, carrying 11 or more wires.

(6) Crossarms shall be designed to withstand the loading specified in subsection (4) above combined with the unbalanced tension of one wire broken at the pin farthest from the pole.

(7) The poles, or towers, may be permitted a reasonable deflection under the specified loading, provided that such deflection does not reduce the clearances specified more than 25 percent, or produce stresses in excess of those specified in WAC 296-44-875. [Rule 36, subsections 17-23, filed 8/3/61.]

WAC 296-44-870 Crossings over railroads, street railroads, telephone, telegraph, signal or other power lines—Factors of safety.

(1) The ultimate unit stresses divided by the allowable unit stress shall be not less than the following:

Wires and cables	2
Pins	2
Insulators, conductor attachments and guys	3
Wooden poles and crossarms	3
Structural steel	3

Reinforced concrete poles and crossarms	4
Foundations	2

(2) Insulators: Each insulator shall be subjected to a dry flash over test for five consecutive minutes at the following test voltages:

Line voltage	Test voltage
Less than 30,000	3 times line voltage
Exceeding 30,000 but not exceeding 50,000	2 1/2 times line voltage
Exceeding 50,000	2 1/4 times line voltage

Each insulator shall further be so designed that, with excessive potential, at rated frequency, failure will first occur by flash over and not by puncture.

(3) Each separate part of a built-up insulator shall be subjected to its dry flash over test for five consecutive minutes. The minimum test voltage for each given part of a built-up insulator shall be the potential difference across such part when the assembled insulator is subjected to test as specified in subsection (2) above.

(4) Each insulator shall be subjected to a wet flash over test, under a precipitation of water of one-fifth of an inch per minute, at an inclination of forty-five degrees to the axis of the insulator at the following test voltages:

Line voltage	Test voltage
Less than 30,000	2 times line voltage
Exceeding 30,000	1 3/4 times line voltage

(5) Test voltage above 35,000 volts shall be determined by the A.I.E.E. Standard Spark-Gap Method.

(6) Test voltages below 35,000 volts shall be determined by transformer ratio.

(7) Conductors: The conductors shall be of copper, aluminum or other noncorrodible material or of steel covered with such noncorrodible material.

(8) Conductors shall be of such mechanical strength that when subjected to the most severe loading conditions specified in WAC 296-44-865(1), the tension will not exceed fifty percent of the ultimate strength of the conductor and that under the maximum deflection from such loading the clearances specified will not be reduced.

(9) Insulators for use on lines operated at a potential in excess of 5,000 volts shall be of porcelain or such other material and design that the insulator will have a mechanical strength equivalent to a porcelain insulator, conforming in dielectric strength to subsections 2-6 above.

(10) Strain insulators for guys shall have an ultimate strength of not less than twice that of the guy in which placed. Strain insulators for guys shall not flash over at the line voltage under a precipitation of one-fifth of an inch per minute, at an inclination of forty-five degrees to the axis of the insulator.

Note—This only applies in the case of guys placed in observance of WAC 296-44-860(13).

(11) Pins: For voltage of 15,000 and over, insulator pins shall be of steel, wrought iron, malleable iron, or other approved metal or alloy, and shall be galvanized or otherwise protected from corrosion: *Provided*, That cast

iron pins having a minimum diameter of 1/2 inch need not be galvanized or otherwise specially protected from corrosion.

(12) Guys: Guys shall be galvanized or copper-covered stranded steel cable, not less than 1/4 inch in diameter, or galvanized rolled rods of equivalent tensile strength.

Note—This only applies in the case of guys placed in observance of WAC 296-44-860(13).

(13) Guys to the ground shall connect to a galvanized anchor rod, extending at least one foot above the ground level.

Note—This only applies in the case of guys placed in observance of WAC 296-44-860(13).

(14) Wooden poles: Wooden poles supporting conductors operated at a potential in excess of 7,500 volts shall be of selected timber, peeled, free from defects which would decrease their strength or durability, not less than seven inches minimum diameter at the top, and meeting the requirements as specified in WAC 296-44-865(4) and (5) and subsection (1) of this section. [Rule 36, subsections 24-37, filed 8/3/61.]

WAC 296-44-875 Crossings over railroads, street railroads, telephone, telegraph, signal or other power lines—Working unit stresses. Obtained by dividing the ultimate breaking strength by the factors of safety given in WAC 296-44-870(1).

(1) Structural steel:	Lbs. Per Sq. In.
Tension (net section)	18,000
Shear	14,000
	L
Compression	18,000 -60-
	R
	R equals radius of gyration.

(2) Rivets, pins:	
Shear	10,000
Bearing	20,000
Bending	20,000

(3)Bolts:	
Shear	8,500
Bearing	17,000
Bending	17,000

(4) Wires and cables:	
Copper hard drawn, solid B. & S. G. 4-0, 3-0, 2-0	25,000
Copper hard drawn, solid B. & S. G. 1-0	27,500
Copper hard drawn, solid B. & S. G. No. 1	28,500
Copper hard drawn, solid B. & S. G. Nos. 2, 4, 6,	30,000
Copper soft drawn, solid B. & S. G.	17,000
Copper hard drawn, stranded B. & S. G.	30,000
Copper soft drawn, stranded B. & S. G.	17,000
Aluminum, hard drawn, stranded, B. & S. G. under 4-0	12,000
Aluminum, hard drawn, stranded, B. & S. G. 4-0 and over	11,500

(5) Untreated timber:		
	Bending	Compression
	Lbs. Per Sq. In.	L (I— —) 60D
Eastern white cedar	600	600
Chestnut	850	850
Washington cedar	850	850

	Bending	Compression
	Lbs. Per Sq. In.	L (I— —) 60D
Idaho cedar	850	850
Port Oxford cedar	1,150	1,150
Long-leaf yellow pine	1,000	1,000
Short-leaf yellow pine	800	800
Douglas fir	900	900
White oak	950	950
Red cedar	700	700
Bald cypress (heartwood)	800	800
Redwood	650	650
Catalpa	500	500
Juniper	550	550

L equals length in inches.
D equals least side, or diameter, in inches.

Note 1—In lieu of the above construction, power lines may be carried on poles of such length and spaced at such distances that a wire breaking at any point in the crossing span will swing clear of wire leads below and not come within ten feet of the ground at the highest point.

Note 2—Drop wires from a pole to the patrons' premises or wires crossing over same need not conform to the foregoing specifications except as covered by the following note.

Note 3—Telephone and telegraph lines, and telephone and power drops or service wires must be placed below power wires carrying 750 volts or more, or otherwise must maintain the same standard of strength as the wires they cross or are above.

Note 4—Only the construction last in point of time so run, placed, erected or maintained shall be held to be in violation of the provisions of this rule.

[Rule 36, subsections 38-41, filed 8/3/61.]

WAC 296-44-880 Crossings over railroads, street railroads, telephone, telegraph, signal or other power lines—Clearance.

CLEARANCE The following clearances shall be maintained in all crossing spans	Rails of Buildings Railroads	Telephone, Telegraph and Signal wires	Power Lines 750 Volts and less, Except Trolley wires
Telephone, Telegraph and Signal Wires	25'	2' above or below*	
Power Lines 750 volts and less, except Trolley Wires	25'	Less 300V 2' above More 300V 3' above	2' above or below
Power Lines more than 750 volts and less than 7,500 volts	28'	6'	3' above 3' above or below
Power lines more than 7,500 volts and less than 15,000 volts	28'	6'	7' above 7' above
Power Lines 15,000 volts or more	34'	8'	7' above 7' above
Trolley Wires	22'	4' below+	4' below

CLEARANCE	Rails of Buildings	Telephone, Telegraph and Signal wires	Power Lines 750 Volts and less, Except Trolley wires
The following clearances shall be maintained in all crossing spans	Rail-roads		

Drops and Service Wires	25'	2' above or below	Less 300V 2' below More 300V 3' below
-------------------------	-----	-------------------	--

* Unless suitably supported to prevent contact.
+ Except for properly protected cables when two feet will be permitted

CLEARANCE	Power Lines	Power Lines more than 7,500 and less than 15,000 volts	Power Lines 15,000 volts or more	Trolley Wires
The following clearances shall be maintained in all crossing spans	more than 750 and less than 7,500 volts	7,500 and less than 15,000 volts	15,000 volts or more	

Telephone, Telegraph and Signal Wires

CLEARANCE	Power Lines	Power Lines more than 7,500 and less than 15,000 volts	Power Lines 15,000 volts or more	Trolley Wires
The following clearances shall be maintained in all crossing spans	more than 750 and less than 7,500 volts	7,500 and less than 15,000 volts	15,000 volts or more	

Power Lines 750 volts and less, except Trolley Wires				
Power Lines more than 750 volts and less than 7,500 volts	3' above or below			
Power Lines more than 7,500 volts and less than 15,000 volts	7' above or below	7' above or below		
Power Lines 15,000 volts or more	7' above or below	7' above or below	7' above or below	
Trolley Wires	4' below	7' below	7' below	None
Drops and Service Wires	3' below	7' below	7' below	3'

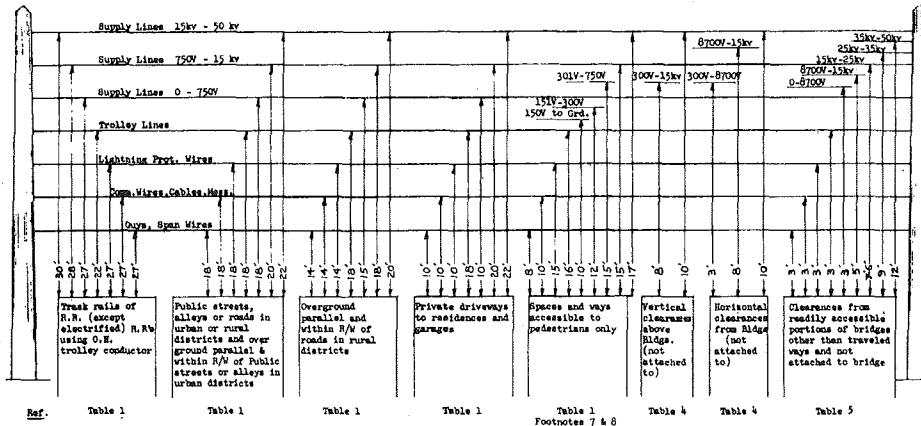
+ Except for properly protected cables when two feet will be permitted.

[Rule (part), (codified as WAC 296-44-880), filed 8/3/61.]

WAC 296-44-88001 Figure 1—Ground wire clearance.

GROUND AND WIRE CLEARANCES

Fig. 1



NOTE: Above clearances are subject to local ordinances and laws.
State Highways are governed by franchise.
For voltages above 50 kv - Basic clearance at 50 kv plus 0.5 ins. per kv in excess of 50 kv.

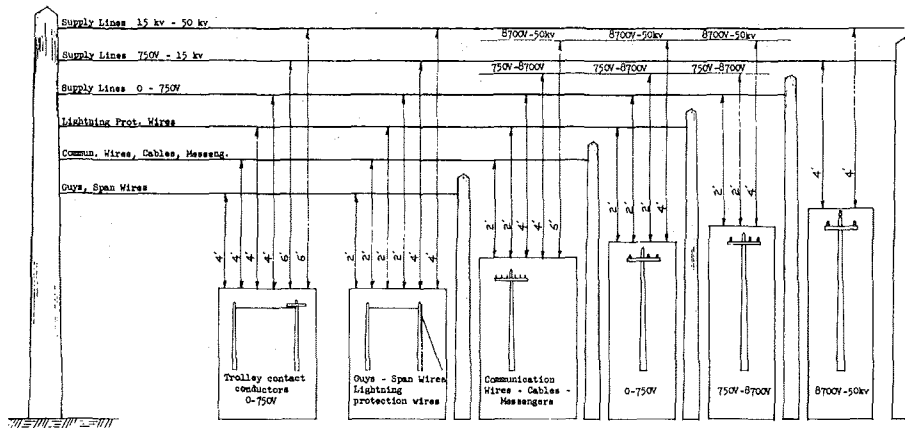
REF: WAC 296-44-316(1) Table 1, WAC 296-44-322(3) and (4) Tables 4 and 5.

[Figure 1, (codified as WAC 296-44-88001), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88002 Figure 2--Basic wire crossing clearance.

BASIC WIRE CROSSING CLEARANCES

Fig. 2

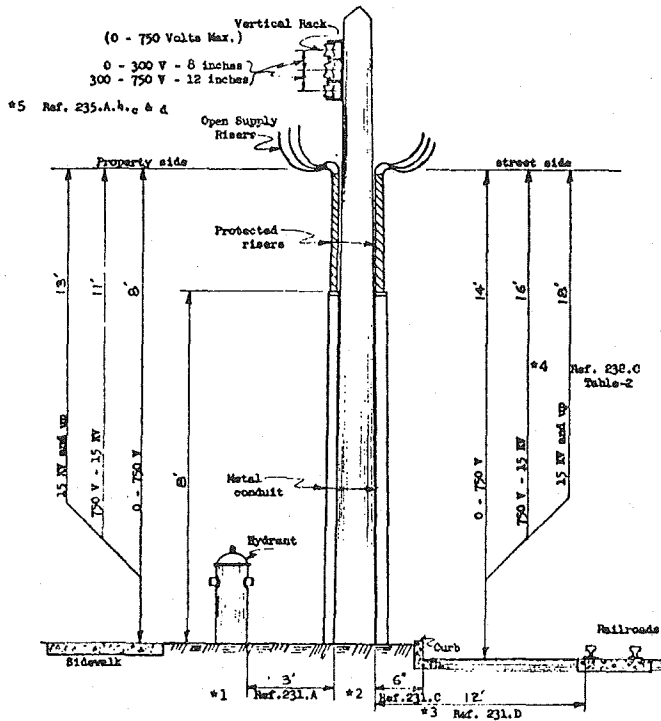


Ref: WAC 296-44-319(1) - Table 3

[Figure 2, (codified as WAC 296-44-88002), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88003 Figure 5—Clearances above ground for underground risers and horizontal clearance of poles from hydrants, curbs and railroads.

FIG. 5



Clearances above ground for underground risers and horizontal clearance of poles from hydrants, curbs and railroads.

- *1 WAC 296-44-313(1).
- *2 WAC 296-44-313(3).
- *3 WAC 296-44-313(4).
- *4 WAC 296-44-316(3).
- *5 WAC 296-44-325(1)(d)(iii) and (iv).

[Figure 5, (codified as WAC 296-44-88003), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88004 Illustration—Working space.

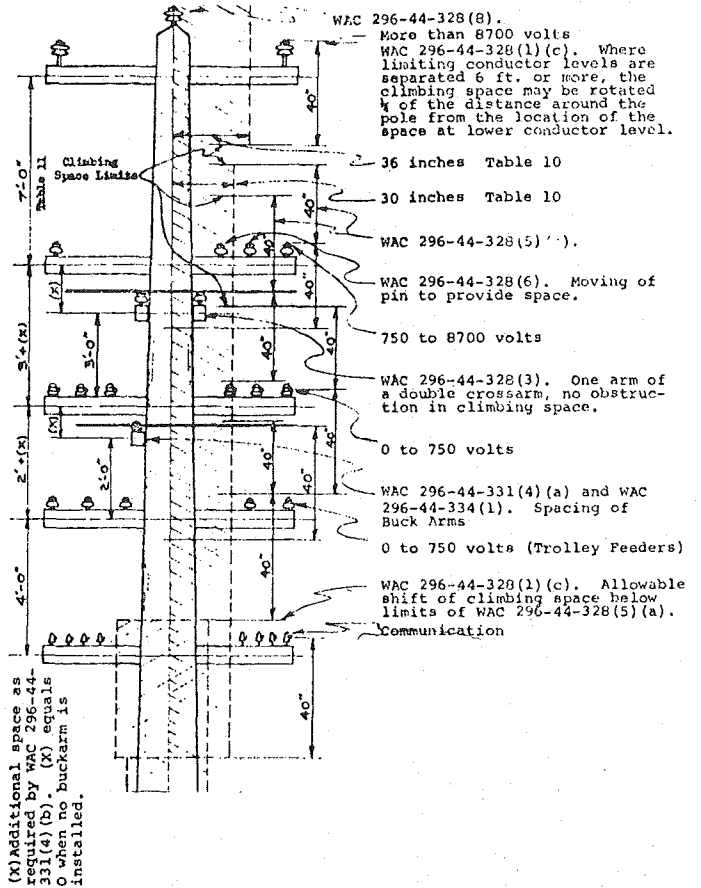


Illustration of Minimum Crossarm Spacing and Minimum Climbing & Working Spaces

Note: The climbing space at communication conductors shall be the same as required for supply conductors immediately above, with a maximum of 30". (Footnote 2 - Table 10)

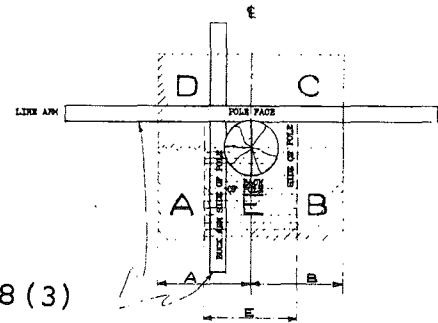
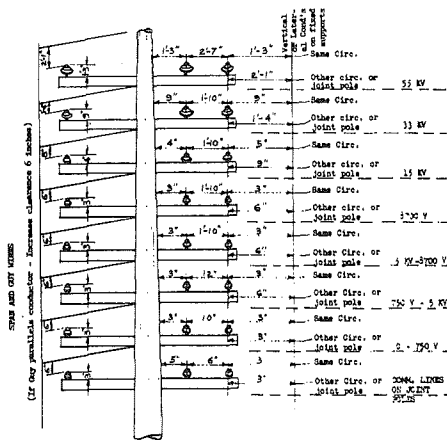
The climbing space of supply conductors shall be that required by Table 10 for the highest voltage conductor bounding the climbing space and where this voltage level is 40" or less above or below the next lower voltage level than the larger space shall be required. (The vertical separation of conductors on standard pin supports are the regular points for reference.)

[Illustration, (codified as WAC 296-44-88004), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88005 Figures 6.A - 9.A--Clearances.

WAC 296-44-88006 Figure--Climbing space.

FIG 6.A - 9.A



WAC 296-44-328 (3)

MINIMUM CLEARANCES BETWEEN CONDUCTORS AND FROM CONDUCTORS TO GUYS, SURFACES OF POLES, CROSSARMS, VERTICAL OR LATERAL CONDUCTORS ATTACHED TO FIXED SUPPORTS.

These clearances graphically represented are Basic Minimums and are not intended to represent absolute allowable clearances under these rules.

Note: If suspension insulators are not restrained from movement, these clearances are to be maintained with insulator swing of 45° on steel supports or 30° on wooden supports.

Interpolation: For vertical and lateral conductors of over 8700 Volts OF THE SAME CIRCUIT - 3 ins. plus 0.25 in. for each 1000 Volts. OF OTHER CIRCUITS - 6 ins. plus 0.4 in. for each 1000 Volts.

REF. WAC 296-44-325 - Tables 6 and 9
WAC 296-44-334(5)(c)

[Figures 6.A - 9.A, (codified as WAC 296-44-88005), filed 3/23/60, effective 12/1/58.]

WAC 296-44-328(3) A single cross arm at any conductor level is considered as an obstruction in the climbing space. WAC 296-44-328(4).

WAC 296-44-328(1)(c) "A"- "B"- "C"- & "D" Pole quadrants of the dimensions specified in Table #10 for the voltage of the conductor concerned.

If climbing space is located in quadrant "B", then it may be rotated to quadrant "A" or "C" in any 6 ft. conductor separation.

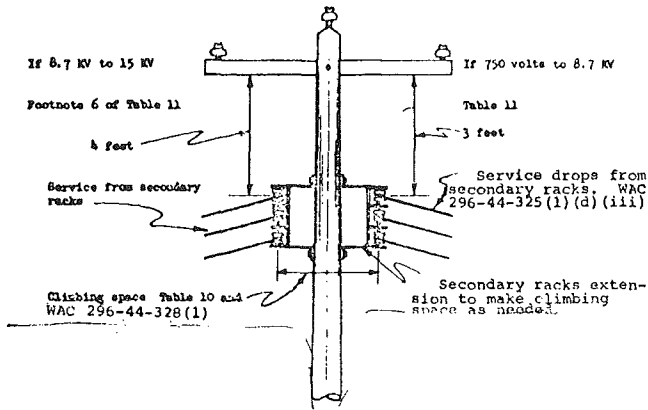
"E" Climbing space on back of pole and may be shifted to quadrants "A" or "B" at 40 inches below limiting conductor levels, or to "C" or "D" in any 6 ft. conductor spacing by the shortest path.

WAC 296-44-331(4) Location of buckarms in relation to linearms.

Note: Conductors supported in standard 29 1/2 in. pin spaces which conflict with the climbing space requirements shall be considered in compliance with the 30 in. climbing space as specified in WAC 296-44-328.

[Figure, (codified as WAC 296-44-88006), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88007 Illustration--Climbing space.

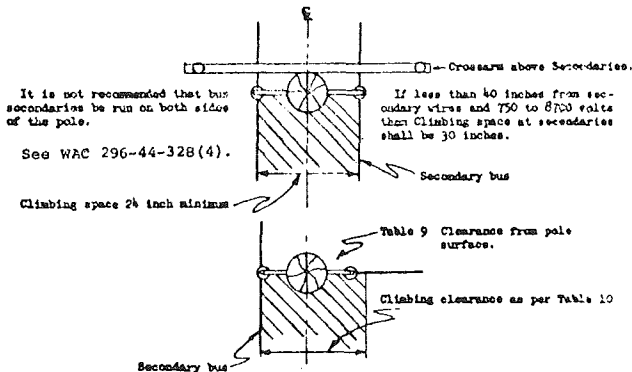


Note: The following application of these rules will be made when secondary racks installed according to WAC 296-44-325(1)(d) are involved.

- (1) Secondary racks will be considered the same as crossarms for the application of Table 11 and dimensions as per WAC 296-44-334(1) will apply.
- (2) The top and bottom conductors will be the limiting conductors as per WAC 296-44-328(5)(a).

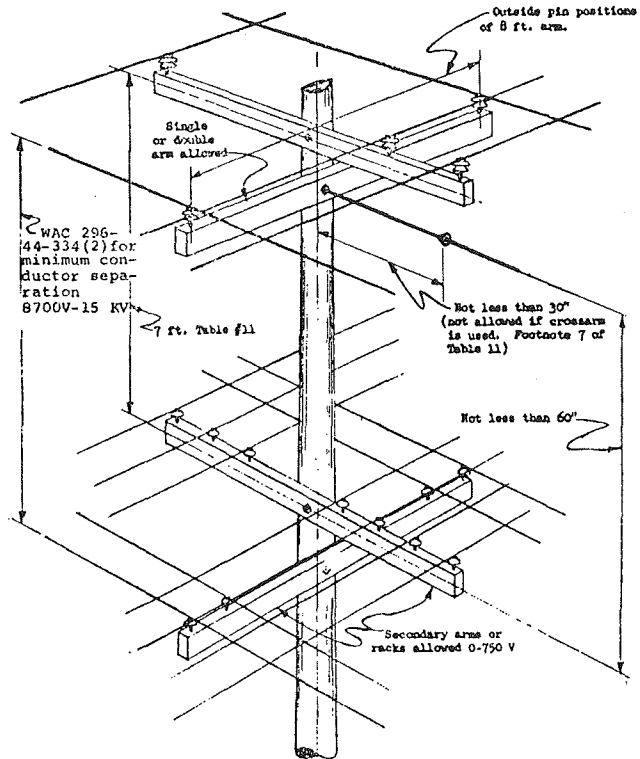
[Illustration, (codified as WAC 296-44-88007), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88008 Illustration--Climbing space.



[Illustration, (codified as WAC 296-44-88008), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88009 Illustration--Footnote 7 of Table 11--Climbing space.



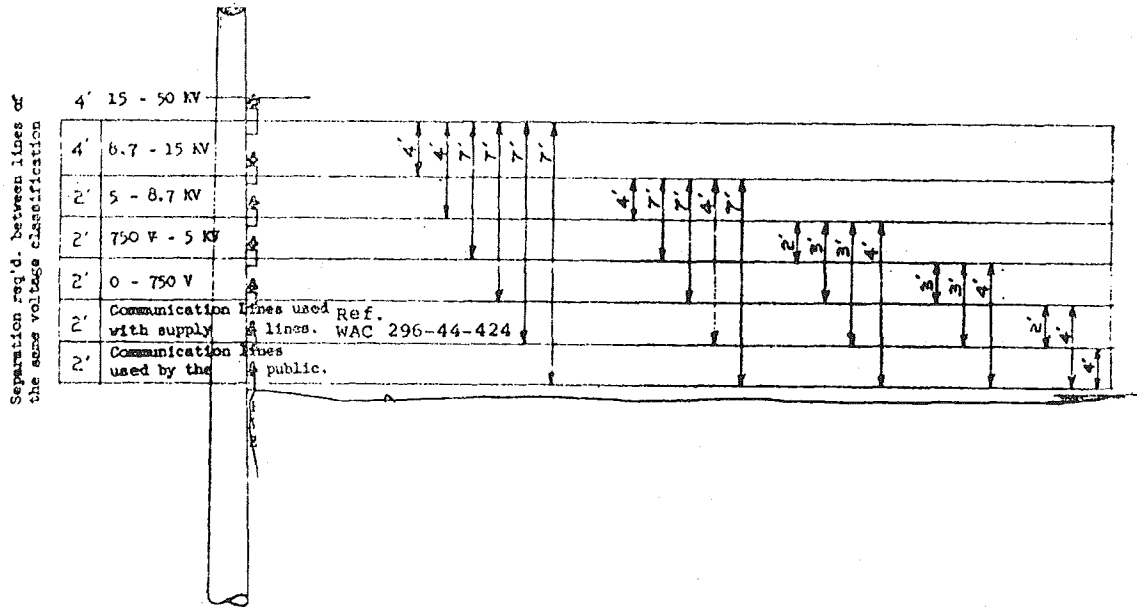
REF. - WAC 296-44-334(1)(a).
FOOTNOTE 7 OF TABLE #11.

[Illustration, (codified as WAC 296-44-88009), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88010 Figure 11.A--Minimum vertical separation between horizontal crossarms.

FIG. 11.A

Minimum vertical separation between horizontal crossarms of the same utility and communication circuits.



Ref. WAC 296-44-334 - Table 11

Exception: See WAC 296-44-334(1)(a), Table 11-Footer 6.

WHERE CONDUCTORS ARE OF THE SAME VOLTAGE CLASSIFICATION

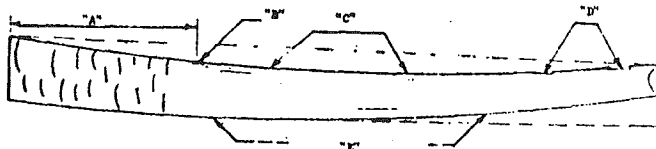
Where crossarm separation is:

Separation between conductors may be reduced to:

2 Ft.	16 ins.
3 Ft.	28 ins.
4 Ft.	40 ins.
6 Ft.	60 ins.
7 Ft.	70 ins.

[Figure 11.A, (codified as WAC 296-44-88010), filed 3/23/60, effective 12/1/58.]

WAC 296-44-88011 Illustration--Climbing space-- Location and spacing of crossarms.



WAC 296-44-400(1)(f) Length or distance from butt of pole to butt gain or

other marking that will indicate depth of pole setting.

WAC 296-44-400(1)(f) Butt gain or other permanent marking.

WAC 296-44-328(3) Face of pole, preferred for the location of line arms.

"D" Cut gains for the location and spacing of crossarms.

"E" Back of pole. Preferred location of climbing space.

[Illustration, (codified as WAC 296-44-88011), filed 3/23/60, effective 12/1/58.]

Chapter 296-45 WAC
SAFETY STANDARDS—ELECTRICAL
WORKERS

WAC

- 296-45-650 Electrical workers safety rules—Foreword.
- 296-45-65003 Scope and application.
- 296-45-65005 Definitions.
- 296-45-65009 Employer's responsibility.
- 296-45-65011 Foreman's responsibility.
- 296-45-65013 Foreman-employee responsibility.
- 296-45-65015 Work required of foremen.
- 296-45-65017 Employee's responsibility.
- 296-45-65019 First aid.
- 296-45-65021 Tools and protective equipment.
- 296-45-65023 Clearances, operating power lines and equipment.
- 296-45-65025 Grounding.
- 296-45-65027 General requirements.
- 296-45-65029 Overhead lines.
- 296-45-65031 Poles and pole settings.
- 296-45-65033 Transmission line construction.
- 296-45-65035 Substations.
- 296-45-65037 Underground.
- 296-45-65039 Trolley maintenance, jumpering or by-passing.
- 296-45-65041 Aerial manlift equipment.
- 296-45-65043 All motor vehicle and trailer operations.
- 296-45-65045 Material handling.
- 296-45-65047 Specification for linemen's belts and similar equipment.
- 296-45-675 Rotorcraft/helicopter for power distribution and transmission line installation, construction and repair—Scope.
- 296-45-67503 Definitions.
- 296-45-67505 Briefing.
- 296-45-67507 Signals.
- 296-45-67509 Slings and tag lines.
- 296-45-67511 Cargo hooks.
- 296-45-67513 Personal protective equipment.
- 296-45-67515 Wearing apparel.
- 296-45-67517 Loose gear and objects.
- 296-45-67519 Housekeeping.
- 296-45-67521 Operator's responsibility.
- 296-45-67523 Hooking and unhooking loads.
- 296-45-67525 Static charge.
- 296-45-67527 Load permitted.
- 296-45-67529 Visibility.
- 296-45-67531 Signal systems.
- 296-45-67533 Approaching the helicopter.
- 296-45-67535 In helicopter.
- 296-45-67537 Sling and rigging.
- 296-45-67539 Personnel.
- 296-45-67541 Fires.
- 296-45-67543 General.

DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS
CHAPTER

- 296-45-010 General. [§ 296-45-010, filed 1/3/68; § I, Rules 1.1 through 1.9, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-020 Causes of accident. [§ I, Rule 1.10, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-030 Safety. [§ I, Rule 1.11, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-040 Definitions. [§ I, Rules 1.12 through 1.29, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-050 Employer's responsibility. [§ II, Rules 2.1 through 2.11, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-060 Foreman's responsibility. [§ II, Rules 2.12 through 2.23, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-070 Employees' responsibility. [§ II, Rules 2.24 through 2.31, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-080 First aid. [§ III, Rules 3.1 through 3.4, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-090 Industrial hygiene. [§ III, Rules 3.5 through 3.7, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-110 Tools—General. [§ IV, Rules 4.1 through 4.7, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-120 Tools—Inspection of tools. [§ IV, Rules 4.8 and 4.9, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-130 Tools—Storage of tools and materials. [§ IV, Rule 4.10, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-140 Tools—Hand tools—Using metal objects. [§ IV, Rules 4.11 and 4.12, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-150 Tools—Ladders. [§ IV, Rules 4.13 through 4.27, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-160 Tools—Scaffolds. [§ IV, Rule 4.28, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-170 Tools—Guards and barriers. [§ IV, Rule 4.29, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-180 Tools—Grounding equipment. [§ IV, Rules 4.30 and 4.31, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-190 Tools—Hot line tools. [§ IV, Rules 4.32 and 4.33, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-200 Tools—Switch stick. [§ IV, Rules 4.34 and 4.35, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-210 Tools—Climbing equipment. [§ IV, Rules 4.36 through 4.39, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-220 Protective devices—Rubber protective equipment. [§ IV, Rules 4.40 through 4.51, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-230 Equipment—Soldering equipment. [§ IV, Rules 4.52 through 4.55, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-240 Equipment—Fire extinguishers. [§ IV, Rule 4.56, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-250 Wearing apparel. [§ 296-45-250, filed 1/3/68; § IV, Rules 4.57 through 4.61, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-260 Transportation—Motor vehicle and trailer operations law. [§ IV, Rule 4.62, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-270 Transportation—Safety practices. [§ 296-45-270, filed 1/3/68; § IV, Rules 4.63 through 4.69, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-280 Employee qualifications. [§ V, Rule 5.1, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-290 Work required of foreman. [§ V, Rule 5.2, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-300 Number of men required to do work safely. [§ V, Rules 5.3 through 5.5, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-310 Replacing or pulling fuses. [§ V, Rules 5.6 through 5.8, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-320 Electric utility employee operated motor cranes, "A" frames, aerial lift equipment, hole digger, winches, etc. [§ V, Rule 5.9, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-330 Working on or near energized lines or equipment. [§ V, Rules 5.10 through 5.15, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.

- 296-45-340 Stringing or removing wires. [§ V, Rule 5.16, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-350 Temporary guard poles and structures. [§ V, Rule 5.17, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-360 Safe working practices. [§ V, Rules 5.18 through 5.46, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-370 Overhead lines—Working above energized circuits over 5 K.V. [§ V, Rules 5.47 through 5.50, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-380 Overhead lines—Using hot line tools. [§ V, Rules 5.51 through 5.54, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-390 Overhead lines—Strength of spans and their supports. [§ V, Rules 5.55 and 5.56, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-400 Overhead lines—Foreign operations. [§ V, Rule 5.57, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-410 Overhead lines—Tree trimming. [§ V, Rule 5.58, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-420 Overhead lines—Foreign attachments and placards. [§ V, Rule 5.59, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-430 Substations and generating plants—General. [§ V, Rules 5.60 through 5.64, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-440 Maintenance of clearance. [§ V, Rule 5.65, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-450 Number of men required to work safely. [§ V, Rule 5.66, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-460 Safe working practices. [§ V, Rules 5.67 through 5.78, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-470 Clearances. [§ VI, Rules 6.1 through 6.13, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-480 Grounding. [§ VI, Rules 6.14 through 6.25, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-490 Underground maintenance—General. [§ VII, Rule 7.1, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-500 Underground maintenance—Working in manholes. [§ VII, Rules 7.2 through 7.7, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-510 Underground maintenance—Guarding manholes and street openings. [§ VII, Rules 7.8 through 7.12, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-520 Underground maintenance—Use of tools and equipment. [§ VII, Rules 7.13 through 7.17, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-530 Underground maintenance—Pulling U.G. cable. [§ VII, Rule 7.18, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-540 Underground maintenance—Testing. [§ VII, Rules 7.19 through 7.21, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-550 Underground maintenance—Fishing conduit or ducts. [§ VII, Rule 7.22, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-560 Underground maintenance—Working in elevated position. [§ VII, Rule 7.23, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-570 Underground maintenance—Grounding U.G. power conductors and equipment. [§ VII, Rules 7.24 through 7.27, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-580 Trolley maintenance. [§ VII, Rules 7.28 through 7.40, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-590 Aerial manlift equipment. [§ 296-45-590, filed 1/3/68; § VIII, Rules 8.1 through 8.10, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.
- 296-45-600 Conclusion. [Matter following Rule 8.10, filed 3/23/60, effective 2/3/56.] Repealed by Order 76-38, filed 12/30/76.

WAC 296-45-650 Electrical workers safety rules—Foreword. The purpose of this chapter is to make the workplace of electrical employees as free from recognized hazard as is reasonably possible. The observance of these rules may in some instances require that speed and work performance be subordinated to the safety of employees. Since the purpose of these rules is the safety of employees, it is expected that those employees engaged in the work for which these rules are intended will, in good faith, adhere to the provisions of this chapter. This chapter is not intended to be a complete description of the work to be done nor is it complete in the sense that additional or unusual hazards may not exist for which there is no regulation or rule. In the event a hazard exists which is not contemplated by this chapter, it is expected that the foreman and employees will in good faith mutually discuss the particular hazard and arrive at a method of performing the work with the greatest degree of safety.

The Department of Labor and Industries is the sole and paramount administrative agency responsible for the administration and interpretation of this chapter and the Washington Industrial Safety and Health Act of 1973. If there exists a question as to the meaning of any provision of this chapter, such question must first be directed to the Department of Labor and Industries and its authorized representatives.

Experience has proven that the majority of injuries and deaths are preventable. Most injuries and deaths are not due to defective equipment but are due to failure on the part of the employees and those in authority to observe safety rules and failure to use safety devices. In the last analysis, this chapter is a compilation of experience and common sense. Electrical safety requires that the work be properly planned, executed by the use of good judgment and under the direction of intelligent supervision. [Order 76-38, § 296-45-650, filed 12/30/76.]

WAC 296-45-65003 Scope and application. (1) The work for which this chapter is enacted is a specialized type of construction work and, insofar as it is specialized, such operations, procedures and work require a particular type of rule or regulation which is generally embodied within this chapter. The purpose of this chapter shall be to avoid those hazards peculiar to the industry, the purpose for which this chapter is designed, and this chapter shall include employees and employers whose business and work include power distribution and transmission lines. The standards apply to all such construction work of an electrical nature regardless of the general nature of the business. The criterion for application of this chapter shall be the nature of the particular work to be or which is being performed. That work

which is intended to be encompassed within the provisions of the mandatory and recommended provisions of this chapter shall include that work, conditions, practices, means, operations and processes performed at or on power distribution and transmission line installations, regardless of location, whether such installation for power distribution is (are) above ground or below ground, and shall include such adjacent and supporting structures as are fairly encompassed by these regulations.

Generally, the nature of the work will be such that industrial insurance premiums could reasonably be said to be reportable; (as of the effective date of this chapter) under WAC 296-17-521 (Class 5-8); WAC 296-17-522 (Class 6-1); and WAC 296-17-539 (Class 13-1). This guideline applies insofar as said class either directly or indirectly is related to the construction, erection, maintenance, repair, alteration, or other operation involving power distribution and transmission lines.

(2) Communication lines and work directed communication lines as defined in chapter 296-32 WAC (Safety Rules for Tele-communications) are subject to the provisions of chapter 296-32 WAC and are not encompassed within the scope of this chapter.

(3) These standards shall apply to installations under the exclusive control of electric utilities used for the purpose of communications or metering, or for generation, control, transformation, transmission, and distribution of electric energy, which are located in buildings used exclusively by the electric utilities for such purposes, or located outdoors on property owned or leased by the electric utilities or on public highways, streets, roads, etc., or outdoors by established rights on private property.

(4) Operation, conditions, work methods and other work related situations or activities not specifically covered by this chapter are subject to the rules and regulations of chapter 296-24 WAC, General Safety and Health Standards; chapter 296-62 WAC, General Occupational Health Standards; chapter 296-155 WAC, Safety Standards for Construction Work; and, insofar as applicable to employee safety and health, RCW 19.29. Additionally, operations, conditions, work methods and other work related situations or activities may be subject to additional rules and regulations depending upon the nature of the work being performed.

(5) Under certain circumstances, an employer may obtain a variance from the Director of the Department of Labor and Industries or his authorized representative. Until such time as a variance is granted, the employer and employees must comply with the mandatory provisions of this chapter. The procedure and requirements for variances are found in WAC 296-350-200 through WAC 296-350-280.

(6) These rules shall not apply to the use of existing electrical installations during their lifetime, provided they are maintained in good condition and in accordance with the applicable safety factor requirements and the rules in effect at the time they were installed, and provided that reconstruction shall conform to the rules as herein provided.

(7) Any rule, regulation or standard contained within this chapter, if subject to interpretation, shall be interpreted so as to achieve employee safety, which is the ultimate purpose of this chapter.

(8) Should a rule or standard contained within this chapter conflict, in any manner, with a standard or rule contained within a general (horizontal) chapter, the standard or rule contained herein shall apply so long as the work being done is electrical work involving power distribution and transmission lines. Should a standard or rule contained within this chapter conflict, in any manner, with a standard or rule contained within a specialized (vertical) chapter (one which applies to a particular type of work), the standard or rule contained herein shall apply as long as the work being performed involves power distribution and transmission lines as hereinbefore defined. Should there be a conflict between two or more standards or rules contained within this chapter, the standard or rule which affords the worker greater safety shall apply.

(9) Neither the promulgation of these rules, nor anything contained in these rules shall be construed as affecting the relative status or civil rights or liabilities between employers and their employees and/or the employees of others and/or the public generally; nor shall the use herein of the words "duty" and "responsibility" or either, import or imply liability other than provided for in the industrial insurance and safety laws of the State of Washington, to any person for injuries due to negligence predicated upon failure to perform or discharge any such "duty" or "responsibility," but failure on the part of the employees, foreman, or employer to comply with any compulsory rule may be cause for the Department of Labor and Industries to take action in accordance with the industrial insurance and safety laws.

(10) "Shall" and "must" as used in this chapter make the provisions mandatory. "Should," "may," or "it is recommended" are used to indicate the provisions are not mandatory but are recommended.

(11) If any section, subsection, phrase, or provisions of this chapter or part thereof should be held invalid by any court for any reason, such invalidity shall not in any way affect the validity of the remainder of this chapter, unless such decision renders the remainder of the provision unintelligible, or changes the meaning of such other provision or provisions.

(12) When the language used in this chapter indicates that it is the responsibility, duty, or obligation of the foreman or other employee, it shall also be the employer's responsibility, obligation, and duty.

Whenever this chapter refers to the provisions of another safety and health standard or statute affecting safety and health, such reference refers to the statute or code in effect at the time the work is being performed. [Order 76-38, § 296-45-65003, filed 12/30/76.]

WAC 296-45-65005 Definitions. These definitions are applicable to chapter 296-45 WAC.

(1) "Aerial Manlift Equipment." All types of equipment such as extended towers, boom-mounted cages or baskets, and truck-mounted ladders. This equipment is

primarily designed to place personnel and equipment aloft to work on elevated structures and equipment.

(2) "Apprentice." An employee who is being trained to be a journeyman.

(3) "Approved." Meets or exceeds the recognized standards of safety within the industry.

(4) "Approved Protectors." Gloves worn over rubber insulating gloves which are of such material or substance and so constructed as to protect the rubber gloves from abrasions, lacerations, or other physical damage which might otherwise occur to rubber gloves. Approved protectors must conform to the standards which are recognized by the industry.

(5) "Automatic Circuit Recloser." A self-controlled device for automatically interrupting and reclosing an alternating current circuit with a predetermined sequence of opening and reclosing followed by resetting, hold closed, or lockout operation.

(6) "Barrier." A physical obstruction which is intended to prevent contact with energized lines or equipment.

(7) "Barricade." A physical obstruction such as tapes, screens, or cones intended to warn and limit access to a hazardous area.

(8) "Belts." (a) "Lineman's Body Belt." A waist belt of approved material with a front buckle, two "D" rings for attaching safety straps and multiple loop strap for holding tools.

(b) "Strap." An adjustable leather, web, nylon, or other approved material in various lengths which permit free use of both hands in circling of post, pole, girder, etc. The safety strap permits the employee to assume a safe working position.

(c) "Construction Belt." A strong leather, web, or other approved material belt at least 1 3/4 inches wide that may be equipped with fixed or adjustable "D" rings for attaching safety straps or lanyards.

(d) "Lanyard." A flexible line or strap of high tensile strength with snap hooks at one or both ends. They serve as safety straps or tail lines for use with belts or harness.

(9) "Bond." An electrical connection from one conductive element to another for the purpose of minimizing potential differences or providing adequate conductivity for fault current or for mitigation of leakage current and electrolytic action.

(10) "Bushing." An insulating structure including a through conductor, or providing a passageway for such a conductor, with provision for mounting on a barrier, conducting or otherwise, for the purpose of insulating the conductor from the barrier and conducting current from one side of the barrier to the other.

(11) "Cable." A conductor with insulation, or a stranded conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors insulated from one another (multiple-conductor cable).

(12) "Cable Sheath." A protective covering applied to cables. A cable sheath may consist of multiple layers of which one or more is conductive.

(13) "Circuit." A conductor or system of conductors through which an electric current is intended to flow.

(14) "Clearance (operating power lines and equipment)." The certification by the proper authority that a

specified line or piece of equipment is deenergized, that the proper precautionary measures have been taken and the line or equipment is being turned over to the employee.

(15) "Climbing Space." The vertical space reserved along the side of poles or structures to permit ready access to equipment and conductors located on poles or structures.

(16) "Communication Lines." The conductors and their supporting or containing structures which are used for public or private signal or communication service: *Provided*, That such lines operate at potentials not exceeding 400 volts to ground or 750 volts between any two points of the circuit: *Provided further*, That the transmitted power does not exceed 150 watts. When operating at less than 150 volts, no limit is placed on the capacity of the system.

Communication lines generally include telephone, telegraph, cable antenna TV, railroad signal, data, clock, fire, police alarm, community television antenna, or other similar systems conforming with the above. Lines used for signaling purposes, but not included under the above definition, are considered as supply lines of the same voltage and are to be so run.

(17) "Conductor." Any material, usually in the form of a wire, cable, or bus bar which is approved for carrying an electric current.

(18) "Conductor Shielding." An envelope which encloses the conductor of a cable and provides an equipotential surface in contact with the cable insulation.

(19) "Current-carrying Part." A conducting part intended to be connected in an electric circuit to a source of voltage. Noncurrent-carrying parts are those not intended to be so connected.

(20) "De-energized (or Dead)." Free from any electrical connection to a source of potential difference and from electrical charges. "Dead" is used only with reference to current-carrying parts which are sometimes alive or energized.

(21) "Designated or Authorized Employee." A qualified person delegated to perform specific duties under the conditions existing.

(22) "Effectively Grounded." Intentionally connected to earth through a ground connection or connections of sufficiently low impedance and having sufficient current-carrying capacity to prevent the buildup of voltages which may result in undue hazard to connected equipment or to persons.

(23) "Electric Line Truck." Any vehicle used to transport men, tools, and material, which serves as a traveling workshop for electric power line construction and maintenance work. It may be equipped with a boom and auxiliary equipment for setting poles, digging holes, and elevating material and/or workers.

(24) "Electric Supply Lines." Those conductors used to transmit electric energy together with necessary supporting and containing structures. Signal lines of more than 400 volts to ground are always electric supply lines if they are installed and used as electric supply lines.

(25) "Emergency." An unforeseen occurrence endangering life, limb, or property.

(26) "Enclosed." Surrounded by a case, cage, fence or otherwise which will protect the contained equipment and prevent accidental contact of a person with live parts.

(27) "Energized, Alive, or Live." Electrically connected to a source of potential difference or electrically charged so as to have a potential different from that of the earth or different from that of adjacent conductors or equipment. Electrical connections of less than 100 volts are not considered energized. Communication or signal lines as defined in this chapter are not considered energized.

(28) "Equipment." A general term which includes fittings, devices, appliances, fixtures, apparatus, and comparable equipment used as part of, or in connection with, an electrical power transmission and distribution system, or utility communication systems over 400 volts.

(29) "Exposed." Not isolated or guarded.

(30) "Fault Current." As used in this chapter means the current that flows in an electrical system because of a defect in the circuit induced accidentally or otherwise.

(31) "Fixed Ladder." A ladder which is permanently secured to a structure.

(32) "Foreman or Man-in-Charge." The person directly in charge of workers doing the work, regardless of title.

(33) "Foreign Operation." Any business or work being performed which does not come within the mandatory scope and application of this chapter; an operation which would otherwise be subject to the provisions of this chapter may be subject to the provisions of another chapter in the event the employees performing the particular work were not competent as defined within the provisions of this chapter.

(34) "Guarded." Protected by personnel, covered, fenced, or enclosed by means of approved casings, barrier rails, screens, mats, platforms, or other approved devices in accordance with standard barricading techniques designed to prevent dangerous approach or contact by persons or conductive objects.

(35) "Ground" (reference). That conductive body, usually earth or a system ground, to which an electric potential is referenced.

(36) "Ground" (as a noun). A conductive connection, whether intentional or accidental, by which an electric circuit or equipment is connected to reference ground.

(37) "Ground" (as a verb). The connecting or establishment of a connection, whether by intention or accident, of an electric circuit or equipment to reference ground.

(38) "Grounding." For the purpose of these rules, means the act of placing shorts and grounds on de-energized conductors and equipment.

(39) "Grounding Electrode (Ground Electrode)." A conductor embedded in the earth, used for maintaining ground potential on conductors connected to it, and for dissipating into the earth current conducted to it.

(40) "Grounding Electrode Resistance." The resistance of the grounding electrode to earth.

(41) "Grounding Electrode Conductor (Grounding Conductor)." A conductor used to connect equipment or

the grounded circuit of a wiring system to a grounding electrode.

(42) "Grounded Conductor." A system or circuit conductor which is intentionally grounded.

(43) "Grounded System." A system of conductors in which at least one conductor or point (usually the middle wire, or neutral point of transformer or generator windings) is intentionally grounded either solidly or through a current-limiting device (not a current-interrupting device).

(44) "Groundman." A member of crew working on ground under direction of foreman.

(45) "Hotline Tools and Ropes." Those tools and ropes which are specifically designed for work on energized high voltage lines and equipment.

(46) "Insulated." Separated from other conducting surfaces by a dielectric substance including air space offering a high resistance to the passage of current. When any object is said to be insulated, it is understood to be insulated in an approved manner for the conditions to which it is subjected. Insulated covering of conductors is one means of making the conductor insulated.

(47) "Insulation (as applied to cable)." That which is relied upon to insulate the conductor from other conductors or conducting parts or from ground.

(48) "Insulation Shielding." An envelope which encloses the insulation of a cable and provides an equipotential surface in contact with cable insulation.

(49) "Isolated." An object that is not readily accessible to persons unless special means of access are used.

(50) "Manhole." A subsurface enclosure which personnel may enter and which is used for the purpose of installing, operating, and maintaining equipment and/or cable.

(51) "Neutral." A system in which one conductor is used as the neutral for one or more circuits; one conductor may be used as the neutral for both primary and secondary circuits of a distribution system.

(52) "Pole." Any device used to support a power distribution or transmission line. The pole may be made of any substance including wood, concrete, metal, is usually cylindrical in shape and comparatively slender. It is the upright standard to which is affixed part of the power distribution and transmission line system as defined in this chapter.

(53) "Portable Ladder." As used in this chapter means a ladder capable of being moved by hand or manually and one which is usually moved into position by hand.

(54) "Power Dispatcher (Load Dispatcher or System Operator)." A person who has been designated by the employer as having authority over switching and clearances of high voltage lines and station equipment.

(55) "Protective Devices." Those devices such as rubber gloves, rubber blankets, line hose, rubber boots, or other insulating devices, which are specifically designed for the protection of employees.

(56) "Public Highway." For the purpose of these rules shall include every way, land, road, street, boulevard, and every other way or place in the state open as a matter of right to public vehicular travel, both inside and

outside the limits of cities and towns, regardless of ownership.

(57) "Pulling Tension." The longitudinal force exerted on a cable during installation.

(58) "Qualified Person or Qualified Employee." A person who is familiar with the construction of, or operation of such lines and/or equipment that concerns his position and who is fully aware of the hazards connected therewith, OR, one who has passed a journeyman's examination for the particular branch of the electrical trades with which he may be connected.

(59) "Secured Ladder." A ladder which is not capable of being dislodged from the top by lateral, or jerking motion(s).

(60) "Sheath." As applied to tools carried in lineman's tool belt shall mean a sheath that effectively covers the tool and prevents such tool from falling from the belt.

(61) "Switch." A device for opening and closing or changing the connection of a circuit. In these rules, a switch is understood to be manually operable, unless otherwise stated.

(62) "Tag." A system or method of identifying circuits, systems, or equipment for the purpose of alerting employees and others that the circuit, system, or equipment is being worked on.

(63) "Rubber." Any goods, equipment, or tool made out of either natural or synthetic rubber.

(64) "Unstable Material." Earth material, other than running, that because of its nature or the influence of other conditions, cannot be depended upon to remain in place without extra support, such as would be furnished by a system of shoring.

(65) "Vault." An enclosure into which personnel may enter and used for the purpose of installing, operating, or maintaining equipment and cable.

(66) "Voltage." The effective (rms) potential difference between any two conductors or between a conductor and ground. Voltages are expressed in nominal values. The nominal voltage of a system or circuit is the value assigned to a system or circuit of a given voltage class for the purpose of convenient designation. The operating voltage of the system may vary above or below this value.

(67) "Voltage of an Effectively Grounded Circuit." The voltage between any conductor and ground unless otherwise indicated.

(68) "Voltage of a Circuit Not Effectively Grounded." The voltage between any two conductors. If one circuit is directly connected to and supplied from another circuit of higher voltage (as in the case of an auto-transformer), both are considered as of the higher voltage, unless the circuit of lower voltage is effectively grounded, in which case its voltage is not determined by the circuit of higher voltage. Direct connection implies electric connection as distinguished from connection merely through electromagnetic or electrostatic induction. Low voltage includes voltages from 100 to 750 volts. High voltage shall mean those voltages of 751 volts to 230,000. Extra high voltage means any voltage over 230,000 volts. Where the words "high voltage" are used in this chapter it shall include extra high voltage,

unless otherwise specified. [Order 76-38, § 296-45-65005, filed 12/30/76.]

WAC 296-45-65009 Employer's responsibility. (1)

The employer shall provide and maintain the necessary protective devices specified in these rules and require the employees to use them properly.

(2) There shall be installed and maintained in every fixed establishment employing eight or more persons a safety bulletin board of a 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.

(3) The employer shall require the foremen to observe and enforce all safety rules and shall furnish a copy of the Electrical Workers' Safety Rules to each employee who is covered by these rules.

(4) The employer shall appoint only competent workers to supervise other employees and those appointed shall be responsible for the safety of the employees under their supervision.

(5) The employer shall hold safety meetings at least once a month, which meetings shall be held at a reasonable time and place as selected by the employer. The employer shall require all employees subject to provisions of this chapter to attend said meetings: *Provided*, That employees whose presence is otherwise required by reason of an emergency or whose function is such that they cannot leave their station or cease their work without serious detriment to the service provided, such as dispatcher, may be excused from such meeting under those circumstances.

Minutes shall be kept of each safety meeting and retained for a period of one year.

(6) The employer or a representative(s) designated by him shall investigate all accidents or injuries of a serious nature and, where possible, take the proper remedial steps to prevent the occurrence of similar accidents.

(7) The employer shall furnish instructions stating the proper procedure in event of an emergency, which shall include the names of those individuals to be notified and methods of contacting them.

(8) The employer shall provide and make available to all employees accident report and safety suggestion forms.

(9) In the case of fatal accident, immediate notice shall be given by the employer or his authorized representative either by telephone or telegraph (collect) to the Department of Labor and Industries, Division of Industrial Safety and Health, Olympia, Washington, or any of its branch offices. All such notices shall include time, place, and date of the accident and the employer's name.

(10) Nothing contained within this chapter shall prohibit an employer or his authorized representative from disciplining employees for failure to comply with the provisions of this or any other safety code. [Order 76-38, § 296-45-65009, filed 12/30/76.]

WAC 296-45-65011 Foreman's responsibility. (1)

Every foreman shall understand these and any other applicable safety rules and comply therewith. Foremen

shall require all employees under their direction or supervision to read this chapter and the provisions contained therein and require every employee subject to this chapter to be able to apply this chapter and any provision of this chapter on a day-to-day basis.

(2) Foremen shall inform employees under their supervision or direction of the type and voltage of circuits on or near which the employees are to work.

(3) Foremen shall require all employees under their supervision to properly use safety devices and equipment, including barricades, warning flags or signs, or any other device called for to protect employees. [Order 76-38, § 296-45-65011, filed 12/30/76.]

WAC 296-45-65013 Foreman-employee responsibility. (1) An employee shall protect his climbing and working space at all times if the conductors are so spaced that in climbing or working he will be, or where it is possible to come within, the minimum required distances specified in these rules.

(2) Foremen or supervisors shall in good faith consider verbal or written reports of hazardous conditions and shall, as soon as practicable, investigate and remedy same if warranted.

(3) When hazards are reported by employees, foremen and others having authority shall accept the report in a cooperative manner, and in no case shall an employee be reprimanded or penalized for reporting hazards or potential hazards.

(4) Foremen shall require all employees under their supervision to keep their belts, spurs, and straps in good working condition. When straps and belts are in poor condition or defective, they shall not be used.

(5) Before leaving a jobsite, foremen shall correct or arrange to give warning of any condition which might result in injury to employees.

(6) No employee shall be permitted or allowed to remain on the jobsite when under the influence of any intoxicating beverage or controlled substance or substances: *Provided*, That if an employee is taking prescription medication under the direction of a practicing physician and such prescription does not interfere with the safe performance of the work assigned, such employee may be permitted to work.

(7) No intoxicating beverages or controlled substances shall be consumed on the jobsite other than prescription medication as set forth above. [Order 76-38, § 296-45-65013, filed 12/30/76.]

WAC 296-45-65015 Work required of foremen. (1) A foreman cannot properly supervise the work and look out for the safety of employees under his direction if required to work as a foreman and a lineman at the same time.

(2) Foremen should be constantly alert and shall not be required to serve in such dual capacity, except in crews of not more than two linemen, in which case they may work as one of the linemen.

(3) In crews of two linemen or less, each lineman may have a groundman but, if additional linemen or groundmen are added to the crew, the foreman shall confine his activities to supervising the work, as exhibited below:

Type of Crew	Minimum Requirements
2 linemen	One lineman as man-in-charge.
2 linemen plus 1 groundman	One lineman as man-in-charge or climbing foreman.
2 linemen plus 2 groundmen	One lineman as man-in-charge or climbing foreman.
2 linemen plus any combination of 3 linemen or groundmen	One non-climbing foreman. [Order 76-38, § 296-45-65015, filed 12/30/76.]

WAC 296-45-65017 Employee's responsibility. (1) Employees shall not engage in horseplay or scuffling while on the job or jobsite and the employer shall not permit horseplay or scuffling while on the jobsite or otherwise in the course of employment.

(2) During such time as any employee is working on or near any energized line or energized equipment in excess of 750 volts there shall be no talking or communication other than that which is absolutely necessary and essential for the safe and proper performance of the work. Should there be communication or talk from a person other than an employee, the work shall stop until such time as the distraction ceases.

(3) Employees shall report any hazardous or potentially hazardous condition, operation, means, or work in a constructive manner and shall not engage in personality conflicts.

(4) Neither the employer nor the employees shall throw or permit anything to be thrown from elevated position(s) or poles to the ground or lower level, nor shall anything be thrown from the ground or lower level to an elevated position, whether that elevated position is on a pole, aerial manlift or otherwise.

(5) Employees shall report all injuries, regardless of severity, to the employer or designated representative. Report forms furnished by the employer should be used. [Order 76-38, § 296-45-65017, filed 12/30/76.]

WAC 296-45-65019 First aid. In addition to complying with the first aid provisions as found in WAC 296-24-060 through WAC 296-24-073, all employees whose duties require them to work on energized wires, equipment, or to climb poles or related structures, shall take an approved course in controlling bleeding and cardiopulmonary resuscitation, and

(1) All linemen shall be instructed in pole-top rescue and become and remain proficient in its application.

(2) It is recommended that all employees receive basic first aid training.

(3) Safety suggestion forms should, where possible, be used for suggesting the elimination of hazardous conditions and such reported suggestions shall be retained by the employer or his authorized representative. [Order 76-38, § 296-45-65019, filed 12/30/76.]

WAC 296-45-65021 Tools and protective equipment. (1) Protective Equipment. (a) Rubber protective equipment shall be in accordance with the provisions of the American National Standards Institute (ANSI), ANSI J6 series as revised in 1971, as follows:

Item	Standard
Rubber Insulating Gloves	J6.6-1971 Edition
Rubber Matting for Use Around Electrical Apparatus	J6.7-1971 Edition
Rubber Insulating Blankets	J6.4-1971 Edition
Rubber Insulating Hoods	J6.2-1971 Edition
Rubber Insulating Line Hose	J6.1-1971 Edition
Rubber Insulating Sleeves	J6.5-1971 Edition

(b) No protective equipment or material other than rubber shall be used: *Provided*, That such other nonconductive equipment may be used if it provides equal or better (dielectric) electrical and mechanical protection than rubber protective equipment: *Provided*, That the employer obtain before placing in service, manufacturer's data or other data to demonstrate that such nonrubber protective equipment provided equal or better electrical and mechanical protection than approved rubber equipment.

(c) Protective equipment shall not be used at voltages in excess of that for which the manufacturer has supplied data to the employer demonstrating that it is fit for such voltages.

(d) No protective equipment shall be modified, altered, or used for purposes other than those for which it is designed unless and until the manufacturer has, in writing, agreed or suggested that there be such modification, alteration, or use.

(e) High voltage rubber gloves shall have and pass a minimum dielectric test of at least 10,000 volts.

(f) Each rubber glove before it is used shall be inspected for defects and an approved air test performed. If, upon inspection, rubber gloves are either defective or appear to be defective, they shall not be used.

(g) Before being placed in service, all rubber protective equipment shall be numbered and records kept for test purposes and assignment.

(h) Rubber protective equipment shall not be used unless it has been dielectrically tested within six months and bears marking or identification of the date of the dielectric test: *Provided*, That all rubber gloves and rubber sleeves which are in service must be dielectrically tested every three months and shall not be used unless they have been tested within three months and bear marking or identification of the date of the last dielectric test.

(i) Whenever any rubber protective equipment is dielectrically tested, such testing shall be performed by a person or persons familiar with the testing procedure and in a facility which meets the recognized standards in the industry for such testing. All rubber gloves that are in service shall be tested at a voltage twice the amount for which such rubber equipment is used. Whenever a

dielectric test is conducted, the rubber protective equipment shall also be visually inspected in detail for defects.

(j) Approved protectors shall be worn at all times over rubber gloves. Inner liners may be worn if desired.

(k) Rubber gloves when not in use shall be carried in an approved bag provided and designed for that purpose. It shall be provided by the employer and made available to the employees.

(l) Approved rubber gloves and carrying bag shall be assigned to each employee who works with, or is exposed to energized parts.

(m) Rubber protective equipment shall not be vulcanized or patched.

(n) A compartment or box shall be provided on each electric line truck, which box or compartment shall be used for storing rubber protective equipment. No equipment shall be stored in said compartment or box which can or could cause damage to the rubber equipment or goods placed in the compartment or box. Additionally, a separate container or compartment shall be provided for rubber blankets.

(o) Line hose shall not be doubled on themselves at any time. All blankets before storage must be wiped clean and rolled, not folded, before being placed in the container or box.

(p) Protective line equipment of material other than rubber shall be kept clean and visually inspected before each use.

(q) If protective line equipment of material other than rubber is found to be substantially defective or unsuitable for the purpose for which it is designed and intended, said protective line equipment shall not be used for personal protection of employees as may be required in Table 1 of this chapter. Said protective line equipment shall be marked defective but may be otherwise used unless the defect or damage to said protective line equipment creates additional safety hazards.

(r) Line hose or similar type of equipment shall not be used on voltages in excess of 15,000 volts as measured from phase to phase unless the manufacturer specifies otherwise.

(s) All protective hats shall be in accordance with the specifications of ANSI Z89.2-1971 Edition Industrial Protective Helmets for Electrical Workers, Class B, and shall be worn at the jobsite by employees who are exposed to overhead or electrical hazards.

(2) Personal Climbing Equipment. All lineman body belts, safety straps, lanyards, hooks, and other similar equipment shall comply to this chapter. This rule shall not apply to personal climbing equipment in use at the effective date of this chapter during its lifetime provided such equipment is maintained in good condition and in accordance with the applicable safety rule and requirement in effect at the time such equipment was obtained.

(a) Safety lines shall not be used for shock loading and shall be used only for emergency rescue. All safety lines shall be a minimum one-half inch diameter and three- or four-strand first grade manila or its equivalent in strength (2,650 pounds) and durability.

(b) Defective ropes shall not be used and shall be replaced.

(c) Employees, when working from a hook ladder, must either belt themselves securely to the ladder, attach themselves to the structures by means of a safety line, or belt themselves to ladder safety equipment, which shall consist of a safety rope or belting threaded through the rungs or secured to the ladder at intervals of not more than three feet.

(d) Body belts with straps or lanyards shall be worn by employees working at an elevated position such as on poles, towers, or similar structures: *Provided*, That body belts and lanyards need not be used by employees while erecting transmission towers. Body belts and straps shall be inspected each day for defects before use. Defective body belts and straps shall not be used.

(e) Safety straps shall not be placed around poles above the cross-arm except where it is not possible for the strap to slide or be slipped over the top of the pole by inadvertence of the employee. Neither end of the strap shall be allowed to hang loose or dangle while the employee is ascending or descending poles or other structures.

(f) Body belts and safety straps shall not be stored with sharp-edged tools or near sharp objects. When a body belt, safety strap and climbers are kept in the same container, they shall be stored in such a manner as to avoid cutting or puncturing the material of the body belt or safety strap with the gaffs or climbers.

(g) Employees shall not attach metal hooks or other metal devices to body belts. Leather straps or rawhide thongs shall have hardwood or fibre crossbars. Leather straps and rawhide thongs shall not have metal or other conductive crossbars on them.

(h) Climbing gaffs shall be kept properly sharpened and shall be at least 1-1/8 inches in length.

(3) Ladders. (a) Portable metal or other portable conductive ladders shall not be used on or near energized line or equipment except where non-conductive ladders present a greater electrical hazard than conductive ladders. A greater electrical hazard would be static electricity such as might be found in extra high voltage substations. All conductive or metal ladders shall be prominently marked and identified as being conductive and shall be grounded when used near energized lines or equipment.

(b) All ladders including hook type ladders used in structures shall be secured to prevent the ladder from being accidentally displaced.

(c) All ladders shall be handled and stored in such a manner as to prevent damage to the ladder.

(d) When ascending or descending a ladder, the employee shall face the ladder and have free use of both hands.

(e) All defective ladders shall be taken out of service and labeled as defective.

(f) When a ladder is being used which is not fixed or otherwise secured, there shall be an attendant to hold the ladder and watch traffic when the work is being done on streets, alleys, sidewalks, or in industrial plants or other places where there exists the possibility of accidental contact with the ladder by third persons or vehicles.

(g) When working on the ladder, employees shall, where possible, tie the top of the ladder to a substantial object to prevent falling unless the ladder is equipped with approved hooks which may be used for the same purpose.

(h) Portable ladders shall not be moved with employees on the ladder.

(i) No employee shall ascend or descend a rolling ladder while it is moving.

(j) No employee shall stand on the top two steps of a step ladder.

(k) No employee shall use a step ladder as a straight ladder.

(l) All ladders shall be of sufficient strength for the use to which they are placed.

(m) Ladders shall always be placed on a secure footing with both legs resting firmly on the lower surface.

(n) Ladders made by fastening cleats or similar devices across a single rail shall not be used.

(4) Hot Line Tools. (a) Only hot line tools having manufacturer's certification of withstanding the following minimum tests shall be used:

(i) 100,000 volts per foot of length for 5 minutes when the tool is made of fiberglass; or

(ii) 75,000 volts per foot of length for 3 minutes when the tool is made of wood; or

(iii) Other tests which equal or exceed (i) and (ii) of this subsection.

(b) All hot line tools shall be visually inspected each day before use. All hot line tools shall be wiped clean before being used.

(c) Defective hot line tools shall not be used and shall be marked as defective and turned in for repair or replacement.

(d) Hot line tools and ropes shall be inspected each day before use. They shall be stored and maintained and used in such a manner as to prevent damage. Hot line tools and ropes shall not be used for purposes other than line work. Wood hot sticks shall be maintained with a surface coating of varnish or other approved treatment to prevent the absorption of moisture into the stick. The maintenance, inspection, storage, and use of such equipment shall be in conformance with the methods and standards recognized by manufacturers and the industry.

(5) Measuring Ropes and Tapes. (a) Measuring ropes or measuring tapes which are metal or certain conductive strands shall not be used when working on or near energized lines or parts.

(6) Hand Tools. (a) All power hand tool switches shall comply with the provisions of WAC 296-24-650 through WAC 296-24-67005.

(i) Be equipped with three-wire cord having the ground wire permanently connected to the tool frame and having a means for grounding the other end of the cord except when such three-wire cord increases the hazard to the employees or where the hand held tool is double insulated and permanently labeled "Double Insulated."

(ii) Be connected to the power supply by means of an isolating transformer, or other isolated power supply.

(b) All hydraulic tools which are used on or around energized lines or equipment shall use nonconductive

hoses having approved strength for the normal operating pressures. The provisions of WAC 296-155-360(4)(a) and (b) are mandatory.

(c) All pneumatic tools which are used on or around energized lines or equipment shall:

(i) Have nonconducting hoses having approved strength for the normal operating pressures, and

(ii) Have an accumulator on the compressor to collect moisture.

(7) Hand axes shall not be used when working overhead.

(8) Small tools carried in body belts shall be placed so as to present the least danger of coming into accidental contact with live parts.

(9) All tools carried in workers' body belts shall be sheathed: *Provided*, That tower erectors need not comply with this rule except when working on or above electric power equipment or lines.

(10) Tools other than those which are carried in workers' body belts shall not be carried up or lowered down poles or similar structures in belts but shall be raised and lowered by means of an approved container or hand line.

(11) All tools shall be kept in good working condition and shall be properly stored. Defective tools shall be taken out of service.

(12) Tools and loose material shall not be left at the top of poles or structures.

(13) Tools shall be placed where they will not be the cause of injury due to stepping or tripping on them.

(14) The surface and surface preservation of wood tools such as ladders, pike poles, switch sticks, insulating platforms used in electrical work shall be maintained. Only transparent preservatives shall be used. Where ladders and pike poles are not used on or near energized lines and are inspected monthly by qualified inspectors, they may be painted.

(15) Scaffolds shall be constructed and used in conformance with the General Safety and Health Standards (WAC 296-24-82503) and the Safety Standards for Construction Work (WAC 296-155-485) of the State of Washington.

(16) Wearing Apparel. (a) Goggles, rubber gloves, respirators, and other such personal protective devices shall not be interchanged among employees unless they have been sanitized.

(b) Workers shall wear clothing appropriate to the season and the kind of work being performed: *Provided*, That shirts or jumpers with full length sleeves rolled down and protective hats shall be worn when working on or near live parts or while climbing poles.

(c) When working on or near energized parts, employees shall not wear loose dangling watch chains, key chains, or unnecessary metal of any type, and should not wear coats with metal zippers.

(17) When working at night, spotlights or portable lights for emergency lighting shall be provided and used as is necessary to perform work safely.

(18) Sanitary Facilities. The requirements of WAC 296-24-120 through WAC 296-24-130(13) shall be complied with.

(19) Industrial Hygiene. The requirements of chapter 296-62 WAC are mandatory unless they are inconsistent with this chapter.

(20) Fire Extinguishers. Employees should know the location and how to operate fire extinguishers in the worksite vicinity.

(21) Foreign Attachments and Placards. Nails and unauthorized attachments should be removed before climbing above such attachments. When through bolts present a hazard to climbing, they shall be trimmed to a safe length.

(22) Working Near or Over Water. When employees are engaged in work over or near water and when the danger of drowning exists, suitable flotation protection shall be provided and worn as required by WAC 296-24-086. [Order 76-38, § 296-45-65021, filed 12/30/76.]

WAC 296-45-65023 Clearances, operating power lines and equipment. Clearances, directly under the control of the power dispatcher or person acting in that capacity, shall be requested and executed by observing the following rules:

(1) Employers shall designate a qualified person or persons to act in the capacity of power dispatcher, also known as load dispatcher or system operator.

(2) No switch shall be operated and no clearance tag placed or removed without an order from the power dispatcher having jurisdiction, except where standing orders or regulations have been given covering such operations.

(3) In all cases, switching orders must be given directly to the employees in charge of operating the switches by the power dispatcher who has jurisdiction and such communications *must be repeated back word for word to the speaker*. When requesting clearance on lines under the control of the power dispatcher, a person requesting the clearance shall obtain the name of the dispatcher to whom the request was made and the dispatcher shall obtain the name of the person requesting the clearance; and assure himself that the person is qualified to receive such a clearance.

(4) Should it become necessary for a person holding a clearance to leave the job, he shall relinquish his clearance to the dispatcher and a new clearance shall be taken by another qualified person.

(a) In the event of an occurrence which renders it impossible to contact the individual who had a clearance on a given circuit or piece of equipment, that clearance may be released only by the next higher available official who is familiar with the work and has jurisdiction over the circuit or equipment.

(5) The dispatcher shall order clearance tags printed on red cardboard, or equivalent, not less than 2-1/4 inches by 4-1/2 inches, attached to all switches opened or checked open to provide clearance on any line or equipment for employees to work thereon.

(6) Clearance tags attached to substation control devices and to line switches beyond the switchyard of any substation; indicating the limits of the clearance involved; shall state the designation of the switch opened or checked open and tagged; the name of the person to whom the clearance is to be issued; the date and time

the switch was opened or checked open; the name of the dispatcher ordering the switching and tagging; and the name of the person doing the switching and tagging.

(7) Clearance tags attached to airbreak switches opened within a substation shall indicate clearly that the line or equipment is cleared for employees to work thereon.

(8) In cases where more than one person will require clearance on the lines or parts of equipment, the power dispatcher must order complete sets of clearance tags for each person requesting clearance.

(9) When two or more crews are engaged in work at any one location on account of emergency or for other reasons, the proper authority may designate one of the foremen to act as foreman of the combined crews for the purpose of obtaining clearances only.

(10) To meet unforeseen conditions, it will be permissible to tag isolated switches for the dispatcher and issue clearances against this tag. In tagging out inter-utility tie lines, the open switches on the foreign end of the line shall be tagged for the foreign dispatcher requesting the outage who will issue clearances to individuals of his organization against this tag.

(11) No work shall be performed on lines or equipment until the power dispatcher in control of such lines or equipment has clearly granted the clearance. The power dispatcher shall never grant a clearance on lines or equipment before all necessary protective tags are applied, and his own records of such clearance are clear and complete. Before considering any line or equipment to be de-energized, the power dispatcher shall assure himself that all switches which could possibly energize the line or equipment in question have been opened, all phases checked open, the switches tagged and, if possible, locked in the open position.

(12) Metal-clad, draw-out switchgear of over 750 volts in which the physical separation of the disconnecting parts is not visible may be used to clear a line or equipment, provided the switchgear is equipped with:

(a) A positive positioning means to insure that the disconnecting contacts are separated;

(b) An isolating shutter which moves into place between the separated contact for circuit isolation; and

(c) A mechanically-connected indicating means to show that the shutter is in place.

(13) In all other cases, only a visible break of all phases shall be regarded as clearing a line or equipment.

(14) Where two or more 5000-volt (or higher) lines are on the same pole or bus structure, arrangements must be made for simultaneous clearances on all such lines unless the person who requested the clearance specifically states that less will be sufficient.

(15) In giving a clearance, the power dispatcher shall make certain that the man to whom the clearance is given is fully aware of the extent or the limits of his clearance.

(16) The person or persons to whom a clearance has been given shall make certain that all protective grounding or short-circuiting devices installed by him or persons under his direction are removed before clearing the line or equipment to the dispatcher for service.

(17) After receiving notification from the dispatcher that the necessary switching has been done, the person making the request shall take the following precautionary steps before any employee comes in direct contact with the circuit or equipment:

(a) The circuit or equipment shall be tested by generally accepted methods to make certain that it is de-energized.

(b) The circuit or equipment shall be grounded and shorted as prescribed in this section.

(18) No person shall make contact with a circuit or equipment that has not been taken out of service to be worked on until he has the circuit or equipment cleared and tagged by himself or is working directly under the supervision of one who has the circuit or equipment cleared and tagged for himself.

(19) No tag shall be removed and no lines or equipment energized until the clearance has been released to the dispatcher.

(20) There shall be a tag used on any switch, regardless of the voltage or type of construction, where workers are likely to be endangered by the closing of such switch and/or where the switch is not directly visible to the employee protected by the open switch. [Order 76-38, § 296-45-65023, filed 12/30/76.]

WAC 296-45-65025 Grounding. (1) When a line which is energized or which may be energized at over 750 volts is removed from service for the purpose of work thereon, the lines shall be considered and worked on as energized until such line is cleared, tagged and grounded.

(2) Grounding Equipment. (a) Grounding equipment shall be available for use when working on de-energized circuits or parts.

(b) Grounding equipment itself shall be of approved carrying capacity to actuate protective devices such as oil circuit breakers, relays, without destroying the ground equipment itself.

(c) If the work is on new construction, definitely known to be dead and not cut into any point where it is possible for anyone to energize it by mistake, the grounding rule is not compulsory but is advisable when the lines extend a considerable distance.

(3) Preliminary Grounding. Preliminary grounding or other testing shall first be done to determine that the line or equipment to be grounded is de-energized.

(4) Preliminary grounding shall be done as follows:

(a) A conductor, preferably stranded copper cable, shall be attached to a reliable ground. The use of chain is prohibited.

(b) A dry hand line shall then be thrown over the wires to be grounded, attached to the preliminary grounding conductor and, with all men standing in the clear, the grounding conductor may be pulled over the lines.

(c) Care must be taken that every line wire is in contact with the preliminary grounding conductor.

(d) The regular grounds shall then be placed.

(e) Preliminary grounding need not be used when the presence of other energized lines creates additional hazard through the use of preliminary ground, provided an

approved test is made to ascertain that the lines to be grounded are de-energized.

(5) The following are methods of preliminary tests to determine whether a line is de-energized.

(a) A line may be buzzed out by extending the hot line tool equipment with a substantial piece of metal on the end to within a close distance of the line.

(b) Approved testers may be used in some locations, but these shall only be used and accepted as approved testers when such tester has been tested immediately before and after on another line known to be energized or other equivalent testing methods and has been proven to be in good working condition.

(6) Communication Conductors. Bare wire communication conductors on power poles and structures are subject to these rules as energized lines and voltages in excess of 750 volts unless protected by insulating materials.

(7) Attaching Grounds. (a) When attaching grounds, the ground end shall be attached first, and the other end shall then be attached and removed by means of insulated tools or approved devices.

(b) When removing grounds, the grounding device shall first be removed from the line or equipment by using insulated tools or other approved devices.

(c) Grounds shall be placed between work location and the sources of energy and as close as practicable to the work location, or grounds shall be placed at the work location. If work is to be performed at more than one location in a line section, the line section must be grounded and short-circuited at one location in the line section and the conductor to be worked on shall be grounded at each work location. The minimum distance shown in Table 1 shall be maintained from ungrounded conductors at the work location. Where the making of a ground is impracticable, or the condition resulting therefrom would be more hazardous than working on the lines or equipment without grounding, the grounds may be omitted, provided that all work is done according to this chapter as if the line or equipment is energized.

(8) Testing Without Grounds. (a) Grounds may be temporarily removed only when necessary for testing purposes: *Provided*, That during such period of time as the grounds are removed, care shall be exercised during that test procedure.

(9) Grounding to tower shall be made with an approved tower clamp capable of conducting the anticipated fault current.

(10) A ground lead, to be attached to either a tower ground multiple ground system or driven ground, shall be capable of conducting the anticipated fault current and shall have a minimum conductance of No. 2 AWG copper.

(11) The grounding set shall be firmly connected to a reliable ground at the ground end first.

(12) Grounds shall be placed on both sides of the section of line on which work is to be done, with the following exceptions:

(a) Where visible openings, such as airbreak switches, disconnects, disconnected jumpers, etc., are within sight of the job, disconnecting the line from its source of power, and no energized high voltage line crosses over or

below the line section being worked on, and no other source of feed exists to this line section. One ground installation on the side away from a visible opening may be considered to be approved protection.

(b) One ground is adequate when installed at the point where work is being performed if the line is not to be opened or if there is no source of supply beyond the ground or no possibility of contact with other energized lines.

(13) The ground set shall make firm contact with each conductor of the circuits being worked.

(14) In cases where the conductor separation at any pole or structure is so great as to make it impractical to apply shorts on all conductors, and where only one conductor is to be worked on, only that conductor which is to be worked on need be grounded.

(15) No ground shall be removed until all employees are clear of the energized wire or equipment. When removing the grounding set, it shall be disconnected from the line conductors first and lowered to a point below all energized conductors before the ground end is disconnected. [Order 76-38, § 296-45-65025, filed 12/30/76.]

WAC 296-45-65027 General requirements. (1) The live-line bare-handed technique is prohibited on voltages of 750 volts or more.

(2) Number of Men Required To Do Work Safely.

(a) Two competent electrical workers shall be required when performing work on energized high voltage lines or equipment or within the distances in Table 1. One of them shall serve principally as a standby man who shall be so located that he may physically reach the other employee in the event of an accident either with his hand or with a hot stick. The stand-by shall be so positioned as to be able to observe the other employee, his bodily movements, and verbally warn of any impending dangers. In no case when working in pairs shall employees work simultaneously on energized wires or parts of different phases or polarity.

(b) In cases of necessity the stand-by man may temporarily assist the other employee provided that they both work on wires or parts of the same phase or polarity. Both employees shall so position themselves so that the presence of the second man does not increase the hazard.

(c) While on patrol at night and operating a motor vehicle on public highways, there shall be two employees, at least one of whom shall be a journeyman lineman or otherwise a competent or qualified employee. If repair to line or equipment is found to be of such nature as to require two linemen, work shall not proceed until additional help has been obtained provided that in cases of emergency where delay would increase the danger to life, limb, or substantial property, one employee may clear the hazard without assistance.

(3) When only one qualified employee is available and he is required to work on high voltage, these circuits shall be de-energized while the work is performed except for emergencies.

(4) The provisions of subsection (2) of this section do not apply in the following circumstances:

(a) When re-fusing circuits or equipment with a hot stick.

(b) When operating switches by means of operating handle or switch sticks.

(c) When installing or removing a hot line clamp connection with an approved hot stick on single phase line or apparatus, providing that the connection or disconnection does not interrupt or pick up a load.

(5) Initial Determination. (a) Before any work is performed, the location of energized lines and their condition, the location and condition of energized equipment, the condition of the poles, the location of circuits and equipment including power communication lines, CATV and fire alarm circuits, shall be determined as shall any other particular hazard of a particular work site.

(b) No work shall be performed on energized lines or parts until the voltage of such equipment and lines is determined.

(6) Employees shall not stand on or otherwise come in contact with transformer cases or similar equipment while working on energized lines or equipment.

(7) Employees and conducting objects shall not come within the minimum distances as set forth in Table 1 of energized lines or conductors, except:

(a) When working on voltages of 5 Kv between phases or less employees may come within the distances as set forth in Table 1 if and so long as the employees are wearing approved rubber gloves, or use approved line hoses, rubber blankets, guards or barriers or similar approved protective equipment in such a manner as to protect against accidental contact, if the rubber gloves and other protective equipment is used in an approved manner.

(b) Nothing contained herein shall prevent the use of approved hot sticks on any voltage.

(8) Rubber gloves shall be worn or hot sticks used when placing protective equipment on or around energized conductors of voltages of 750 to 5,000 volts.

(9) Rubber gloves shall be worn or hot sticks used when removing tree branches, limbs, or similar objects from contact with high voltages or when such branch, branches, limbs or other conducting object is within the prohibited distance of Table 1. Rubber gloves shall be worn whenever the employee can touch or come within the prohibited distances as provided in Table 1.

(10) Employees should not wear rubber gloves while ascending or descending a pole until such time as the employee becomes so positioned that he is likely or capable of touching voltages of 750 or more.

(11) Rubber gloves, line hoses, rubber blankets, and other recognized protective equipment are barriers when used. Such barriers can be used on voltages of 5,000 or less between phases.

(12) It shall not be permissible to consider one part of a high voltage switch or disconnect as de-energized for the purpose of doing work on it if the remainder of the switch or disconnect remains energized unless approved barriers are erected which will prevent employees who are doing the work on such equipment from coming in direct contact with the energized parts.

(13) Conductor support tools such as link sticks, strain carriers, and insulator cradles may be used: *Provided*, That the clear insulation is at least as long as the insulator string or the minimum distance specified in Table 1 for the operating voltage.

(14) TABLE 1:

Voltage Range (phase to phase) Kilovolt	Minimum Working and Clear Hot Stick Distance
.75 up to 15	2 ft. 0 in.
15 up to 35	2 ft. 4 in.
35 up to 46	2 ft. 6 in.
46 up to 72.5	3 ft. 0 in.
72.5 up to 121	3 ft. 4 in.
121 up to 145	3 ft. 6 in.
145 up to 169	3 ft. 8 in.
169 up to 242	5 ft. 0 in.
242 up to 362	7 ft. 0 in. ¹
362 up to 552	11 ft. 0 in. ¹
552 up to 765	15 ft. 0 in. ¹

¹NOTE: For these voltages of 242 and up, the minimum working distances and the minimum clear hot stick distance at the work location may be reduced when and so long as such distances are not less than the shortest distance between the energized part and grounded surface.

(15) Foreign Operations. All foreign operations as defined within this chapter conducted on or near power lines or energized equipment shall maintain clearance according to the provisions of WAC 296-24-24019. [Order 76-38, § 296-45-65027, filed 12/30/76.]

WAC 296-45-65029 Overhead lines. (1) General.

(a) When working on or with overhead lines, this section shall be complied with as well as the applicable divisions of any other section.

(2) Strength of Span and Its Support. (a) Precautions shall be taken to determine that the span and the supports thereof are of a strength so as to safely bear the weight of the employee(s) and the equipment used thereon.

(b) Before an employee climbs a pole, it shall be inspected or tested to determine that such pole is safe, both above and below the ground level. If the pole is found to be unsafe for climbing, it must be guyed or braced or otherwise supported in such a manner as to allow the employees to safely perform their work.

(c) Before moving conductors there shall be a thorough inspection for strength and good condition of the adjacent supporting poles, structures, and conductor supporting hardware. Approved safeguards shall be installed on such adjacent poles or structures as may be necessary to prevent unexpected or uncontrolled movement of these adjacent poles, structures or conductors supporting equipment or conductors.

(3) When setting, moving or removing poles using cranes, derricks, gin poles, A-frames, or similar equipment near energized lines or equipment, minimum

clearances shall be maintained, as provided by Table 1 except when approved barriers or other line protecting devices have been installed.

(4) Temporary Guard Poles or Structures. Guard poles, towers, or other guard structures installed for the purpose of protecting employees, lines, conductors or equipment during the course of construction shall be installed at the same clearance requirements as for permanent construction and with strength and safety factors as required to safely support the loads that may normally be imposed on them during their use.

(5) The safest possible working position shall be assumed before starting work in the vicinity of energized wires, lines, transformers or similar energized equipment.

(6) No work should be performed in inclement weather on high voltage equipment when conditions are such as to materially increase the hazards to the employees excepting emergency work necessary to restore service.

(7) While work is being performed overhead, tools and materials shall be placed in proper receptacles when not being used. Tools and materials shall not be thrown to or from the employees on the pole or other elevated position(s) but shall be raised and lowered by means of a handline and/or tool bag. Tools and loose materials shall not be left on poles, crossarms, ladders or other elevated structures or positions.

(8) Employees shall not work in elevated positions unless secured so as to prevent accidental falling. They shall be secured by a safety belt or other approved means except when ascending, descending or moving from one location to another while in an elevated position. Before an employee throws his weight on a belt, the employee shall determine that the snap or fasteners are properly engaged.

(9) When winches, trucks, or tractors are being used to raise poles, materials, to pull in wires, to pull slack or in any other operation, there shall be an operator at the controls unless the machinery or process is stopped.

(10) Foremen shall designate an employee to give signals when required.

(11) Raising poles, towers or fixtures in the close proximity of high voltage conductors shall be done under the supervision of a qualified employee.

(12) Employees shall not wear climbers on work where they are not required. Employees shall not continue to wear their climbers while working on the ground; except for momentary or short periods of time on the ground.

(13) After a capacitor has been disconnected from its source of supply, workers shall wait five (5) minutes before short-circuiting and grounding them, unless the capacitor is equipped with an adequate grounding and/or short-circuiting device. Employees shall take care not to contact the terminals, jumpers, or line wires connected directly to capacitors until they have been properly short-circuited and/or grounded.

(14) After removal from service, short circuits shall remain on capacitors in storage until returned to service.

(15) Pulling or slacking shall be done only as directed by the lineman overhead while hoisting or lowering materials by means of a block.

(16) Steel cables shall not be used to raise transformers, poles or any other material except when the cable is rigged below all energized parts at a sufficient distance to prevent any possibility of the cable or conductive material being raised from contacting unguarded energized parts, unless adequately spread, guarded or clearance is maintained as provided in Table 1. The term "energized parts" in this section means wires or equipment carrying more than 300 volts.

(17) Employees shall not crawl over insulator strings but shall use a platform or other approved device to work from when making dead ends or doing other work beyond strings of insulators, at such distance that they cannot reach the work from the pole or fixture. While working on the platform or other device, they shall be secured with safety straps or a rope to prevent falling. The provision of this subsection does not apply to extra high voltage bundle conductors when the use of such equipment may produce additional hazard. Climbing over dead end assemblies is permissible only after they have been completed and pinned in the final position.

(18) When employees are working overhead, employees shall not dig or do any other work that exposes them to danger due to inattention of the work being performed overhead. Employees shall wear approved hard hats when it is necessary to be beneath overhead employees.

(19) Splicers platforms of the type commonly used for splicing or approved ladders securely hooked over or lashed to the strands may be used.

(20) When employees are required to climb through energized circuits of 2.1 KV or more, preventive measures shall be taken so as to minimize the possibility of contact with energized lines. This may include approved spreading and guarding of the energized conductors.

(21) Methods shall be used that will effectively prevent ropes, (excepting hot line ropes) including hand lines, equipment or materials passing through the conductor level from making contact with the energized conductor or equipment of voltages of 2.1 KV or more. This may include approved spreading or guarding.

(22) All lifting equipment shall be bonded to an effective ground or it shall be considered and worked as energized and barricaded when utilized within the prohibited distance of Table 1 or if during the use of such equipment it is possible that it could come within the prohibited distance of Table 1 it shall be considered energized and barricaded. [Order 76-38, § 296-45-65029, filed 12/30/76.]

WAC 296-45-65031 Poles and pole settings. (1) All poles, the methods of use and installation of poles, insofar as they affect the employee safety, are subject to the relevant provisions of the Electrical Construction Code, chapter 296-44 WAC.

(2) Pole holes shall not be left unattended or unguarded.

(3) Tag lines shall be of a nonconductive type when used in an area that will come within the prohibited distance of Table 1 or where it is possible that during use such line could come within the provisions of Table 1.

(4) Framing. During framing operations, employees shall not work under a pole or structure suspended by a crane, A-frame or similar equipment unless it is adequately supported. [Order 76-38, § 296-45-65031, filed 12/30/76.]

WAC 296-45-65033 Transmission line construction.

(1) Metal Tower Construction. (a) When working with unstable material, the excavation for pad or pile-type footings in excess of four feet deep shall be either sloped to the angle of repose, or shored as provided in WAC 296-155-660 and WAC 296-155-665. Ladders shall be used for ingress and egress to a pad or pile-type footing excavation, if such excavation is in excess of four feet in depth. Employees shall not enter excavation to clear, clean or free the auger unless shoring is first installed.

(b) A designated employee shall be used in directing mobile equipment when such equipment either is or could come within the area of the fault line of the footing excavation.

(c) No employee shall be permitted to remain in the footing when equipment is being spotted for placement or being moved within an area that is likely to disturb the soil of or in the area of the excavation. This rule applies to excavation regardless of whether the excavation is shored or not.

(d) When necessary to assure the stability of mobile equipment, the location of use for such equipment shall be graded and leveled.

(e) Tower assembly shall be carried out with a minimum exposure to employees for falling objects. Employees shall not work under overhead work unless it is required by the very process and there is no other feasible method of performing the work.

(f) During construction or assembly, guy lines shall be used to maintain and secure parts of sections in position in towers or equivalent means shall be used.

(g) Tower members and sections being assembled shall be supported by an approved method.

(2) No employees shall be permitted under a tower when it is in the process of erection or assembly, except as may be required to guide and secure the section being set.

(a) When erecting towers using hoisting equipment adjacent to energized lines or equipment, such lines or equipment shall be de-energized if practical. If the lines are not de-energized, additional caution shall be used, such as a competent qualified employee to watch in order to maintain the minimum clearance provided in Table 1.

(b) Erection cranes or similar equipment shall be set on firm, level foundations and when the equipment has outriggers, the outriggers shall be properly used.

(c) Tag lines shall be utilized to maintain control of tower sections until the section is positively secure.

(d) The load lines shall not be detached from the tower sections until the section is positively secure.

(e) Except during emergency restoration procedure, erection shall be discontinued in the event of high wind or other adverse weather conditions when such weather conditions materially increase the hazard of the work being performed.

(f) All equipment and rigging shall be regularly inspected and maintained in safe operating condition.

(g) Traffic controls shall be maintained and used when crossing highways and railways with equipment as required by the provisions of WAC 296-155-300(7)(a) and (b).

(h) A designated employee shall be used and shall observe in order to assure that equipment being moved under or near energized lines or equipment maintains the minimum distance as required in Table 1.

(3) Stringing or Removing De-energized Conductors.

(a) When stringing or removing de-energized conductors, the provisions of this subdivision shall be complied with.

(b) Prior to stringing operations, there shall be a briefing with all affected employees, setting forth the plan of operation and specifying the type of equipment to be used, grounding devices and procedures to be followed, crossover methods to be employed, and the clearance authorization required, together with any other matters which the particular situation requires. Where conducting objects might contact, or come within the prohibited distance as set forth in Table 1, energized circuits, lines or where there might be a voltage build-up, the conductor being installed or removed shall be grounded first or the employee isolated or insulated.

(c) If the existing line is to be de-energized, proper clearance authorization shall be secured, and the line grounded on both sides of the crossing or the line being crossed shall be treated as energized.

(d) When crossing over energized conductors in excess of 750 volts, rope, nets or guard structures shall be installed so as to prevent accidental contact with the energized conductor(s). Where reasonably practical, the automatic reclosing feature of the circuit interrupting device shall be made inoperative.

(e) When conductors are being strung in or removed, they shall be kept under positive control to prevent accidental contact with energized circuit.

(f) Guard structures members shall be of approved dimension, strength and securely supported to meet the purpose for which they are intended.

(g) Catch-off anchors, rigging and hoists shall be of ample capacity to prevent loss of the lines.

(h) Manufacturer's load rating shall not be exceeded for stringing lines, pulling lines, sock connections, and all load-bearing hardware and accessories.

(i) Pulling lines and accessories shall be inspected prior to each use and replaced or repaired when damaged or when there is a reasonable basis to doubt the dependability of such lines or accessories. The provisions of WAC 296-155-330(3)(d)(ii) concerning splices shall not apply to stringing and removing of de-energized conductors.

(j) Conductor grips shall not be used on wire ropes unless designed for that particular purpose.

(k) When the conductor or pulling line is being pulled (in motion) employees shall not be permitted directly under overhead operations, nor shall any employee be permitted on the crossarm.

(l) A transmission clipping crew shall have a minimum of two structures clipped in between the crew and the conductor being sagged. When working on bare de-energized conductors, clipping and tying crews shall work between grounds at all times. The grounds shall remain intact until the conductors are clipped in except on dead end structures.

(m) Except during emergency restoration procedures, work from structures shall be discontinued when there exists adverse weather conditions such as high wind or ice on the structures which would make the work more hazardous than usual.

(n) Removing, stringing and clipping operations shall be discontinued during the process of an electrical storm when such storm reasonably presents an additional hazard.

(o) Reel handling equipment, including pulling and braking machines, shall have ample capacity, operate smoothly and be leveled and aligned in accordance with the manufacturer's operating instructions.

(p) Communication between the reel tender and pulling rig operator shall be provided and maintained.

(q) Each pull shall be snubbed or dead ended at both ends before subsequent pulls.

(4) Stringing Near, Above, Below or Otherwise Adjacent to Energized Lines. (a) Before stringing near, above, below, parallel to an existing line, there shall be a determination as to whether or not there exists a possibility of a dangerously induced voltage buildup, particularly during switching and grounding fault conditions. Where such possibility of danger does exist, employer shall comply with provisions of subdivision (3)(a) through (3)(j) of this subsection in addition to the provisions of subsection (3) of this section unless the line is worked as energized.

(b) When stringing adjacent to or near energized lines, the tension stringing method or other methods which preclude accidental contact between the lines being pulled and any employee shall be used.

(c) All pulling and tensioning equipment shall be isolated, insulated or effectively grounded.

(d) A ground shall be installed at the tensioning reel set-up in order to ground each bare conductor, subconductor and overhead ground conductor during stringing operations.

(e) During stringing operations, each bare conductor, subconductor and overhead ground conductor shall be grounded at the first transmission structure adjacent to both the tensioning and pulling set-up and in increments so that no point is more than two miles from a ground, and

(i) The grounds shall be left in place until the conductor installation is completed.

(ii) Such grounds shall be removed as the last step of aerial cleanup.

(iii) Except for moving type grounds, the grounds shall be placed and removed with a hot stick.

(iv) Conductors, subconductors and overhead ground conductors shall be grounded at all dead-end or catch-off points.

(f) A ground shall be located at each side and within 10 feet of working areas where conductors, subconductors or overhead ground conductors are being spliced at ground level. The two ends to be spliced shall be bonded to each other.

(g) All conductors, subconductors and overhead ground conductors shall be bonded to the tower at any isolated tower where it may be necessary to complete work on the transmission line.

(h) Work on dead-end towers shall require grounding on all de-energized lines.

(i) Removal of temporary guards: Temporary guards shall not be removed until the adjacent structures have been clipped: *Provided*, The guard structures may be removed if safety slings have first been installed on adjacent tower or structure.

(j) When performing work from the structure, clipping crews and all others working on conductors, subconductors, or overhead ground conductors shall be protected by individual grounds installed at each such work location. [Order 76-38, § 296-45-65033, filed 12/30/76.]

WAC 296-45-65035 Substations. (1) Before work is performed on any electrically operated circuit breaker, it shall be cleared from the line and the control switch at the breaker opened. Where circuit breakers are operated by springs, solenoids or compressed air, or similar means, proper precautions shall be taken to prevent unauthorized or accidental operation of the device. This provision does not preclude repairs or adjustments that present no hazard to the employee.

(2) Disconnecting switches must be operated with approved sticks provided for that purpose unless said switches are provided with an operating mechanism having an insulated or grounded handle.

(3) Handles for manual operation of oil circuit breakers shall not be left in their sockets.

(4) Approved insulated platforms or mats shall be provided and used by employees while working on any live part of the switchboard on which any wire or appliance carries a potential in excess of 300 volts.

(5) All generators and motors having a potential of more than 300 volts shall have an approved insulated platform or mat, so arranged so as to permit the attendant to stand upon such a platform or mat when working upon live parts of such generator(s) or motor(s).

(6) Work Near Energized Equipment. (a) When work is performed in an energized substation, authorization shall be obtained from the designated, authorized employee before work is started.

(b) When work is to be done in an energized substation, the following shall be determined prior to the commencement of work:

(i) What facilities are energized, and

(ii) What protective equipment and precautions are necessary for the safety of personnel.

(c) Extraordinary caution shall be exercised in the handling of busbars, tower steel, materials and equipment in the vicinity of energized facilities. The provisions of Table 1 shall be complied with.

(7) Barricades and Barriers. (a) Barricades or barriers shall be installed to prevent accidental contact with energized lines or equipment.

(b) Where appropriate, signs indicating the hazard shall be posted on or near the barricade or barrier. These signs shall comply with the provisions of WAC 296-155-300.

(8) Control Panels. (a) Work on or adjacent to energized control panels shall be performed by designated employees only.

(b) Precautions shall be taken to prevent accidental operation of relays or other devices due to jarring, vibration, or improper wiring.

(9) Mechanized Equipment. (a) Use of vehicles, gin poles, cranes and other equipment in restricted or hazardous areas shall at all times be controlled by a designated employee.

(b) All mobile cranes and derricks shall be effectively grounded when being moved or operated in close proximity to energized lines or equipment, or where there exists a reasonable possibility that said equipment could accidentally move within the prohibited distance as specified in Table 1, or the equipment shall be considered energized.

(10) Storage. (a) The storage requirements of WAC 296-24-21501 through WAC 296-24-21505 are mandatory.

(11) Fences. (a) When a substation fence must be expanded or removed for construction purposes, a temporary fence affording similar protection shall be provided and installed when the site is unattended, approved interconnection with ground shall be maintained between the temporary fence and permanent fence.

(b) All gates to all unattended substations shall be locked, except when work is in progress.

(12) Footing Excavation. (a) Excavation for auger, pad and piling-type footings for structures and towers shall comply with the provisions set forth for metal tower construction. (See WAC 296-45-65033.)

(b) No employee shall enter an unsupported auger-type excavation if such excavation is in unstable material. Necessary clean-out shall be accomplished without entry. [Order 76-38, § 296-45-65035, filed 12/30/76.]

WAC 296-45-65037 Underground. (1) Protective barriers, or approved guards and warning signs must be erected before removing manhole covers or making excavations in places accessible to vehicular or pedestrian traffic.

(2) Whenever an opening is made in the street, it shall be properly guarded or covered until same is closed and whenever an obstruction is left in the roadway after dark, it shall be marked with approved lights, flares or similar devices.

(3) When work is to be performed in a manhole or unvented vault:

(i) No entry shall be permitted unless forced ventilation is provided or the atmosphere is found to be safe by

testing for oxygen deficiency and the presence of explosive or potentially hazardous gases or fumes.

(ii) When unsafe conditions are detected, by testing or other means, the work area shall be ventilated and otherwise made safe before entry.

(iii) Provisions shall be made for a continuous supply of air as provided for in WAC 296-62-110.

(iv) When forced ventilation is not used a method of monitoring said manhole or vault so as to prevent the occurrence of oxygen deficiency due to work being performed in said manhole or vault, and to detect the presence of any explosive gases or fumes which may occur while the employees are working in said manhole or vault.

(4) When open flames are used or smoking is permitted in manholes, adequate mechanical forced air ventilation shall be used.

(5) Before using open flames in a manhole or excavation in an area where combustible gases or liquids may be present, such as near a gasoline service station, the atmosphere of the manhole or excavation shall be tested and found safe or cleared of the combustible gases or liquids prior to the entry.

(6) When work is to be performed in manholes containing any wires or appliances carrying electrical current, they shall be in a sanitary condition.

(7) A watchman shall be kept at the surface when there is any hazard to the employees in the manhole and he should not leave the manhole unwatched until such time as all employees are out and the cover has been replaced.

(8) Care shall be taken to prevent the possibility of vehicles or pedestrians coming in contact with the wires and equipment.

(9) Trenching and Excavating. (a) During excavation or trenching, in order to prevent exposure of employees to the hazards created by damage to dangerous underground facilities, efforts shall be made to determine the location of such facilities and work conducted in a manner designed to avoid damage.

(10) No work shall be permitted to be done in any manhole or subway on any energized wire, cable or appliance carrying more than 300 volts of electricity by less than two competent or qualified persons who shall at all times, while performing such work, be in the same manhole or subway in which work is being done. This rule shall not apply to work on telephone, telegraph or signal wires or cables.

(11) Trenching and excavation operations shall comply with the provisions of WAC 296-155-650 and WAC 296-155-660.

(12) (a) Cables in manholes shall be accessible to employees and clear working space shall be maintained at all times.

(b) Where cables are not permanently identified by tags or otherwise, diagrams and information establishing positive identification and position of the cables shall be provided and supplied to the employees.

(c) Where multiple cables exist in an excavation, cables other than the one being worked on shall be physically protected when necessary.

(d) When multiple cables exist in an excavation, the cables to be worked on shall be identified by approved testing unless its identification is obvious by reason of the distinctive appearance.

(e) Before cutting into a high voltage cable or opening a high voltage splice, the cable shall be de-energized then clearance obtained, tested and then grounded in an approved manner. The cable to be worked on shall be identified by tags or equivalent means.

(f) When working on buried cables or cables in man-holes, the metallic sheath continuity shall be maintained by bonding across the opening or by equivalent means.

(13) Insulated platforms or other protective devices shall be provided when work is to be done on energized wires or equipment in manholes.

(14) Tools and materials shall not be left on the ground around or near the manhole opening where they might be pushed or otherwise fall into the hole.

(15) Furnaces shall always be placed in a secure, level position on the downhill side of the manhole to avoid spillage of hot metals or compounds into the manhole.

(16) Materials shall not be thrown into or out of manholes but shall be placed in the proper receptacle and hoisted in and out by means of a rope.

(17) Pulling Underground Cable. When pulling cable(s) all employees shall be made aware of the hazard of being caught in the sheaves, lashings or winch gears. All employees shall stand clear of the pulling line when the pull is begun or when the line is under tension. This rule applies to all work performed by means of a winch.

(18) Fishing Conduit or Ducts. When fishing conduit or ducts, it shall first be determined that the fish tape or wires will not contact any energized line or equipment.

(19) WAC 296-45-65023 on Clearances and WAC 296-45-65025 on Grounding shall be complied with. [Order 76-38, § 296-45-65037, filed 12/30/76.]

WAC 296-45-65039 Trolley maintenance, jumpering or by-passing. (1) Energized trolley wire shall be jumpered when it is to be opened or cut.

(2) Reaching Over Trolley Wire(s) or System(s). Linemen shall not reach over trolley wire(s) unless properly protected by line hose or rubber blanket.

(3) Reaching Across Sectional Insulators. Linemen shall not reach across section insulator(s), insulated spacer(s) or insulated approach.

(4) Polarity on Either Side of Sectionalizing Breakers. Since the polarity on both sides of a sectionalizing insulator may be different, it is required that prior to performance of work, tests be performed with approved testing equipment to determine whether or not the polarity is the same or different on one side of the sectional insulator as compared with the other.

(5) Working on Hangers. More than one truck crew shall not work on hangers attached to the same span at the same time, without rubber protection.

(6) Workers on Hangers of Opposite Polarity. Trolley hangers and ears of opposite polarity shall not be worked on at the same time when trolley wire is energized.

(7) Checking Electric Switches. When electric switches are checked for operation, making it necessary to

short circuit the contactor to each trolley wire, tools with insulated handles shall be used.

(8) Short Circuit Due to Use of Noninsulated or Conductive Long Handled Tools. When a hazard of short circuit exists, due to use of noninsulated or conductive long handled tools, approved protective rubber equipment shall be used as provided in this chapter.

(9) Trolley Feeders. When work is to be performed on street railway trolley feeders where it is necessary for workers to work from metal or other grounded poles or fixtures or on poles or fixtures on which grounds are maintained, the feeders shall be de-energized unless the poles or fixtures are insulated before the work is started with approved protective devices in such manner that employees cannot become grounded while working on the feeders, and employees shall wear approved rubber gloves. [Order 76-38, § 296-45-65039, filed 12/30/76.]

WAC 296-45-65041 Aerial manlift equipment. This section applies to aerial manlift equipment as defined in WAC 296-45-65005.

(1) A daily visual inspection and operating tests shall be made in accordance with the manufacturer's recommendation by the assigned operator.

(2) Aerial manlift equipment shall be of the type designed and maintained to meet the following safety factors:

(a) Stability Test. All such equipment shall meet or exceed a safety factor of one and one-half to one (1 1/2 to 1) in all working positions, based upon the posted working load.

(b) Structural and Mechanical Tests. All such equipment shall meet or exceed a safety factor of 2 to 1 in all working positions, based upon the manufacturer's maximum rated capacity.

(i) The Division of Industrial Safety and Health will accept, in lieu of subdivision (b) of this section, the safety factor test data submitted by the manufacturer by a competent testing laboratory, or by a registered engineering firm. When and if there exists a reasonable doubt as to whether or not the equipment will meet the data required for stability in structural and mechanical testing, the Division may require that such testing be performed on such equipment before it can be used. If the Division in writing requires that the employer test its equipment or have such equipment tested, the employer will have a reasonable time within which to secure such information as is required by this rule.

(3) Employee shall not move any such equipment in the direction of an obstructed view unless the following requirements have been met. (An obstructed view exists even though the operator is able to see to the rear by reason of a system of mirrors or a mirror.)

(i) Vehicle can be backed up only when observer signals that it is safe to do so or the driver makes a walk-around inspection prior to backing up, or

(ii) The vehicle has a reverse signal alarm audible above the surrounding noise level.

(4) Hydraulic Fluids. (a) All hydraulic fluids used for the insulated section of derrick trucks, aerial lifts, and hydraulic tools which are used on or around energized lines or equipment shall be of the insulating type.

(5) Mechanical adjustment or repairs shall not be attempted or performed in the field except by a person qualified to perform such work.

(6) Malfunction or needed repairs of manlift equipment shall be reported to the employee responsible for such repairs as soon as is reasonably possible. Use of equipment which is known to be in need of repairs or is malfunctioning is prohibited when such deficiency creates an unsafe operating condition.

(7) No employee shall ride in the basket while traveling to or from jobsites.

(8) When any aerial manlift equipment is parked for operation at the jobsite, the brakes shall be set. Wheel chocks shall be used to prevent accidental movement while parked on an incline. If the aerial manlift equipment has outriggers, the outriggers shall be implanted on firm footing and all manufacturer's specifications shall be complied with.

(9) Safety check valves shall be installed in the outrigger hydraulic system which will automatically lock the outrigger in position in case of failure of the hydraulic system except when outriggers are equipped with mechanically self-locking device.

(10) The truck shall not be moved until the boom or ladder is cradled and/or fastened down, the outrigger retracted, and the power take-off disengaged, except for a short move when the truck can be moved with care and under the direction of the employee in the elevated position.

(11) Employees shall not sit or stand on the basket edge, stand on materials placed in or across the basket, or work from a ladder set inside the basket.

(12) The basket shall not be rested on a fixed object(s) so that the weight of the boom is either totally or partially supported by the basket.

(13) Neither the basket, supporting boom or ladder on aerial equipment shall come within the prohibited distance of energized high voltage conductors or equipment as set forth in Table 1 unless protective equipment is used. Special approved insulated tools, insulated fittings and insulated masts need not comply with this section.

(14) When the basket is being used in such a manner that it may contact energized high voltage lines or equipment, the vehicle shall be considered energized at line potential and the following safe practices shall be observed unless such equipment is grounded:

(a) Approved protective devices shall be used.

(b) Before physically contacting, entering or leaving the vehicle, all employees shall make sure that the boom and basket is stationary and not in contact with energized high voltage lines or equipment.

(15) While working in aerial equipment, employees shall wear an approved safety belt attached to the boom or basket, in a secure manner.

(16) No component of aerial devices shall be operated from the ground without permission from the employee in the basket except in case of emergency.

(17) Truck driver shall remain at tower controls while workers are working on towers except when the aerial manlift equipment has been properly chocked to prevent uncontrolled movement. Tower trucks shall be equipped

with a reliable signaling device between the employees working on the tower and the truck driver.

(18) Working on Truck Towers. Employees shall not stand on tower gates or railings. Work shall not be done from plank(s) placed on tower railings.

(19) Tower Truck Railings. Towers shall have standard railings and toeboards around the tower and all railings shall be constructed of wood, fiberglass or other nonmetallic material. All railings shall be a vertical height of not less than 36 inches or more than 42 inches from the floor of the platform to the upper surface of the top rail. Intermediate railings shall be midway between the floor and the underside of the top rail. Tower gates shall be so constructed as to prevent accidental opening.

(20) Tower truck decks shall be kept clear of tools, wire and other materials and tools shall be kept in proper storage area when not in use.

(21) Linemen shall not wear climbers or spurs while working on a tower truck.

(22) Employees operating controls of aerial equipment shall not stand on the ground or on separate grounded surface unless wearing rubber gloves or standing on insulated board or mat, where equipment is exposed to or operated in the near vicinity of high voltage conductors.

(23) Operating levers or controls shall be kept clear of tools, materials or obstructions.

(24) Load limits as recommended by the manufacturer of aerial manlift equipment shall not be exceeded. Shock loading of the equipment is prohibited.

(25) Employees shall not climb into or out of the basket or platform while it is elevated or change from one basket to another on dual basket equipment, except in case of emergency or when the employees involved agree that this is the safest way to perform the work. This exception shall not be used to circumvent safety rules.

(26) Employees shall not belt to adjacent poles, structures, or equipment while performing work from aerial devices.

(27) Whenever it is necessary to work beyond the guarded traffic work area, extreme care shall be exercised and all precautions taken to insure the safety of the operation and the employees.

(28) Power tools not in use shall be disconnected from external power sources.

(29) Electrical, hydraulic or air tools shall have safety switches or devices to prevent accidental operation and, in addition, a quick means of disconnecting on electrically operated equipment shall be within easy reach of the operator.

(30) Existing safety rules governing the use of hot line tools, rubber and other protective equipment and safe work practices while performing work from poles or structures shall also apply to work done from aerial manlift equipment.

(31) The basket shall be kept clean and all tools not in use shall be secured or removed.

(32) Approved warning light shall be operating when the boom leaves the cradle. This light shall be visible to approaching traffic when the boom is in position over any traveled area.

(33) A braking system, independent of the drive-line braking system, shall be installed on all aerial manlift equipment where, from the engineering standpoint, it is feasible.

(34) Safety check valves shall be installed in the hydraulic system of aerial manlift equipment to automatically lock the boom or ladder in position in case of failure to any part of the hydraulic pressure system.

(35) All aerial manlift equipment shall have both upper and lower controls (except ladder trucks need not have upper controls). The upper controls shall not be capable of rendering the lower controls inoperative. The lower controls should be located at or near the base of the aerial structure.

If the lower controls are used, the operator shall have a view of the elevated employee(s) or there shall be communication between the operator and the employee in the elevated aerial structure; *Provided*, That no employee shall be raised, lowered, or moved into or from the elevated position in any aerial manlift equipment unless there is another employee, not in the elevated aerial structure, available at the site to operate the lower controls, except as follows:

(a) Where there is a fixed method permanently attached to or part of the equipment which will permit an employee to descend from the elevated position without lowering the elevated structure, or

(b) Where there is a system which will provide operation from the elevated position in the event of failure or malfunction of the primary system.

This section shall not be interpreted as an exception to any other rule in this chapter.

(36) Controls in aerial manlift equipment shall be protected from accidental operation. Controls of the outriggers shall also be protected from accidental operation. Such protection may be by guarding or equivalent means.

(37) The manufacturer's recommended maximum load limit shall be posted at a conspicuous place near each set of controls and shall be kept in a legible condition.

(38) Side member guys on aerial ladders shall be insulated.

(39) The manufacturer's operator's instructional manual shall be kept on the vehicle.

(40) Operating instructions, proper sequence and maintenance procedures prescribed by the manufacturer for operation of the equipment shall be followed. [Order 76-38, § 296-45-65041, filed 12/30/76.]

WAC 296-45-65043 All motor vehicle and trailer operations. When motor vehicles and trailers are operated on public right-of-way, highways or similar areas, the equipment shall be operated and maintained in conformance with the Motor Vehicle Code of the State of Washington, chapters 46.04 through 46.61 RCW.

(1) Whenever and wherever such motor vehicle is operated, such equipment shall have a safe functioning brake and an emergency brake. In addition, all motor vehicles and trailers shall have such equipment as is necessary for the safe operation of the vehicle(s).

(a) When traveling, employees must ride inside the vehicle and shall not ride on the sides or on the top, nor shall employees ascend or descend a motor vehicle when such vehicle is in motion.

(b) Employees shall not ride on trailers except in cases where the trailer requires an employee to steer or brake the trailer.

(c) A truck shall not be moved from place to place with the ladder erect other than when positioning the truck at a given location. This rule does not apply to approved tower or fixed ladder trucks.

(d) Warning signs, flares and other protective devices shall be used which shall conform with the requirements for road construction or maintenance as set forth in chapter 46.37 RCW. [Order 76-38, § 296-45-65043, filed 12/30/76.]

WAC 296-45-65045 Material handling. (1) Prior to unloading steel, poles, crossarms and similar materials, the load shall be thoroughly examined to determine if the load has shifted, binders or stakes have broken or the load is otherwise hazardous to employees.

(a) The hoist rope shall not be wrapped around the load. This provision shall not apply to electric construction crews when setting or removing poles.

(2) Pole Handling. (a) During pole hauling operations, all loads shall be secured to prevent displacement, and a red flag shall be displayed at the trailing end of the longest pole.

(b) While loading and unloading materials, roadways shall not be blocked unless approved traffic control is used.

(c) When hauling poles during darkness, illuminated warning devices shall be attached to the trailing end of the longest pole in accordance with the State of Washington Motor Vehicle Code.

(3) Tag Lines. When necessary to control loads, tag lines or other approved devices shall be used.

(4) Oil Filled Equipment. During construction or repair of oil filled equipment, the oil may be stored in temporary containers other than those required by WAC 296-155-270, such as pillow tanks.

(5) Storage of Tools and Materials. All tools and materials shall be stored in a safe and orderly manner in yards for equipment and other areas. [Order 76-38, § 296-45-65045, filed 12/30/76.]

WAC 296-45-65047 Specification for linemen's belts and similar equipment. (1) All hardware for linemen's body belts, safety straps and lanyards shall be drop forged or pressed steel and have a corrosive resistive finish tested to the American Society for Testing and Materials B117 as published in 1964 (50 hour test). Surfaces shall be smooth and free from sharp edges.

(a) All buckles shall be those guaranteed by the manufacturer as having at least a 2,000-pound tensile strength with a maximum permanent deformation no greater than one sixty-fourth (1/64) inch.

(b) All "D" rings shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without cracking or breaking.

(c) All snap hooks shall be those guaranteed by the manufacturer as having at least a 5,000-pound tensile strength without distortion sufficient to release the keeper.

(d) All fabric used for safety straps shall be guaranteed by the manufacturer as being capable of withstanding either AC or DC dielectric test of not less than 25,000 volts per foot "dry" for 3 minutes without visible deterioration.

(e) All fabric and leather used shall be that which has been represented by the manufacturer as having been tested for leakage current of 1 milliamperes with a potential 3,000 volts when applied to the electrodes positioned 12 inches apart.

(f) The cushion part of the body belt may be either leather or other material provided that it;

(i) Has no exposed rivets on the inside;

(ii) Is at least 3 inches in width;

(iii) Is at least five thirty-seconds ($5/32$) inch thick, if made of leather; or have equivalent strength if made of other material.

(iv) Has pocket tabs that extend at least 1-1/2 inches down and three inches back of the inside of circle of each "D" ring for riveting on plier or tool pockets. On shifting "D" belts, this measurement for pocket tabs shall be taken when the "D" ring section is centered.

(v) A maximum of four (4) tool loops shall be so situated on the body belt that four (4) inches of the body belt in the center of the back, measuring from "D" ring to "D" ring, shall be free of tool loops and any other attachments.

(vi) All stitching shall be of minimum 42-pound weight nylon or equivalent thread and shall be lock stitched. Stitching parallel to an edge shall not be less than three-sixteenths ($3/16$) inch from edge of narrowest member caught by the thread. The use of cross-stitching on leather is prohibited. Approved copper, steel or equivalent liners shall be used around the bar of "D" rings to reduce the wear.

(vii) The keeper of snap hooks shall have a spring tension that will not allow the keeper to begin to open with a weight of 2-1/2 pounds or less, but the keeper of snap hooks shall begin to open with a weight of four (4) pounds, when the weight is supported on the keeper against the end of the nose.

(2) Testing linemen's safety straps, body belts and lanyards shall be in accordance with the following procedure:

(a) Attach one end of the safety strap or lanyard to a rigid support, the other end shall be attached to a 250-pound canvas bag of sand;

(b) Allow the 250-pound canvas bag of sand to free fall 4 feet for (safety strap test) and 6 feet for (lanyard test), in each case stopping the fall of the 250-pound bag;

(c) Failure of the strap or lanyard shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the strap or lanyard. The entire "body belt assembly" shall be tested using one "D" ring. A safety strap or lanyard shall be used that is capable of passing the "impact loading test" and attached as required in

item (a) of this subdivision. The body belt shall be secured to the 250-pound bag of sand at a point to simulate the waist of a man and allowed to drop as stated in item (b) of this subdivision. Failure of the body belt shall be indicated by any breakage, or slippage sufficient to permit the bag to fall free of the body belt.

(d) Life lines and Lanyards shall comply with the provisions of WAC 296-155-225(2), (3), (5) and (6). [Order 76-38, § 296-45-65047, filed 12/30/76.]

WAC 296-45-675 Rotorcraft/helicopter for power distribution and transmission line installation, construction and repair—Scope. (1) These standards which include WAC 296-45-675 shall apply to work being done

on or near any rotorcraft, helicopter crane, or similar device when such device is for power distribution and transmission line construction, alteration, repair or similar work. These standards include work practices when such equipment is being or is about to be used and shall apply to the exclusion of any other standard should such other standard be in conflict with the standards contained herein.

(2) These rules shall be interpreted where necessary to achieve the protection of employees affected by the hazards particular to the helicopter operation and shall be so interpreted as not to conflict with any federal law or regulation governing the operation or maintenance of such craft. [Order 76-38, § 296-45-675, filed 12/30/76.]

WAC 296-45-67503 Definitions. (1) "Cargo hooks." A device attached or suspended from an aircraft which is used to connect an external load to the aircraft through direct couplings or by lead lines. This unit has both mechanical and electrical locking/unlocking means.

(2) "Designated employees." Those employees selected or designated by the employer to work under or near helicopters who have first been instructed in hooking, unhooking, guiding and securing the load, including the signalman, all of whom have been instructed in the hazards of helicopter work and who know the provisions of this section.

(3) "Downwash." A down and outward air column from the main rotor system.

(4) "Ground personnel or crew." Those employees who are physically and mentally capable, who are familiar with the hazards of helicopter use in power distribution and transmission line work, and who know these rules and the methods of operation.

(5) "Helicopter," helicopter crane," and "rotorcraft." Those aircraft whose support in the air is derived solely from the reaction of a stream of air driven downward by propellers revolving around a vertical axis, which are designed for and capable of carrying external loads. The use of the word helicopter in these rules shall also mean helicopter crane, rotorcraft, or similar device.

(6) "Hooking and unhooking." That process by which an external load is either attached to or released from the cargo hook.

(7) "Positive guide system." A system or method of installing a load into position so that the load is capable of being released from the helicopter without being

otherwise secured so that the load will remain in position permanently or until otherwise secured by physical means.

(8) "Rotors." That system of blades which rotates or revolves to supply lift or direction to the rotorcraft.

(9) "Approved rubber gloves." Rubber insulating gloves used for protection of electrical workers from electric shock while working on energized conductors and equipment.

(10) "Signalman." That member of the ground crew that is designated by an employer to direct, signal and otherwise communicate with the operator of the helicopter.

(11) "Sling line." A strap, chain, rope or the like used to securely hold something being lifted, lowered, carried or otherwise suspended.

(12) "Sock line." A rope(s), cable(s) or similar line(s) which is used to pull a conductor line from a reel or to remove existing strung conductors from poles or towers.

(13) "Static charge." A stationary charge of electricity.

(14) "Tag line." A rope or similar device used to guide or control the direction or movement of a load. [Order 76-38, § 296-45-67503, filed 12/30/76.]

WAC 296-45-67505 Briefing. (1) Before work or a job involving helicopters begins, there shall be a discussion between all affected employees which shall include the ground crew, signalman and pilot or operator of the helicopter. The discussion shall cover the particular hazards of the job, the methods of performing the work and the signals to be used. All employees shall, before the beginning of such work or job, understand in detail the hazards, the methods and the signals to be used and these regulations.

(2) Every employee before being allowed to work on or near helicopter(s) operating with or without load shall be advised and understand the hazards involved, the methods of performing the work, the signals being used and these regulations. [Order 76-38, § 296-45-67505, filed 12/30/76.]

WAC 296-45-67507 Signals. (1) The signals between the signalman and the operator of the helicopter shall be those submitted to the Federal Aviation Agency for the particular procedure or job. In the event no signals have been submitted to the Federal Aviation Administration, a system of signaling shall be used which has been reduced to writing and which is capable of being clearly understood by all employees and others involved in the job.

(2) Should there occur a change in the hazards, method of performing the job, signals to be used, or other operating conditions during the course of any particular job, a conference shall immediately be held at which time all affected employees and others, including signalmen, groundmen, pilot(s), will be advised of such hazards or change of operation. No employee shall be permitted to work unless such employee and others fully understand the change(s) which have taken place. [Order 76-38, § 296-45-67507, filed 12/30/76.]

WAC 296-45-67509 Slings and tag lines. (1) Loads shall be properly slung so that there will be no slippage or shifting of the load and so that the load will not accidentally be dislodged from the helicopter.

(2) Tag lines shall be of such length as not to be capable of being accidentally drawn into or otherwise entering into the rotors.

(3) Pressed sleeves, wedged eyes, or equivalent means shall be used for all suspended loads. [Order 76-38, § 296-45-67509, filed 12/30/76.]

WAC 296-45-67511 Cargo hooks. (1) All electrically operated cargo hooks shall have the electrical activating device which is so designed and installed as to prevent inadvertent or accidental operation. Such cargo hooks shall be equipped with an emergency mechanical or manual control for releasing the load. The electrical control shall be a double button single hand control.

(2) No electrical cargo hook shall be used unless, prior to that day's operation, the releases are tested and functioning properly, both electrically and mechanically (manually).

(3) No employee shall be permitted to work under a hovering helicopter(s) unless the cargo hooks used comply with Federal Aviation Administration regulations governing such hooks. [Order 76-38, § 296-45-67511, filed 12/30/76.]

WAC 296-45-67513 Personal protective equipment. Personal protective equipment when working on, under or in the near vicinity of helicopters:

(1) All employees shall wear eye protection of such design as to prevent the likelihood of dust or other substances from contacting the eye(s) of employees.

(2) All employees shall wear hard hats which shall be secured on the employee's head by a chinstrap. [Order 76-38, § 296-45-67513, filed 12/30/76.]

WAC 296-45-67515 Wearing apparel. No employee shall wear clothing or apparel which is either designed to or in fact can reasonably be expected to flap or otherwise react in a similar fashion in the downwash or air disturbance of a helicopter(s). No employee shall work on, under or in the near vicinity of a helicopter while wearing such apparel or clothing which flaps or moves to the extent that it presents a hazard in that it could be caught in the moving equipment, the hoist line, or otherwise interfere with the safe performance of the work. [Order 76-38, § 296-45-67515, filed 12/30/76.]

WAC 296-45-67517 Loose gear and objects. All loose gear, including lunch boxes, rope, cardboard, wire covers and similar items shall be removed or secured or otherwise made fast before the helicopter is started or allowed to approach such area. In the event the gear is not secured or fastened, it shall be removed and located outside the downwash at least 100 feet from the helicopter. [Order 76-38, § 296-45-67517, filed 12/30/76.]

WAC 296-45-67519 Housekeeping. All helicopter landing, loading and unloading areas shall be maintained

in a neat and orderly fashion so as to reduce the likelihood of flying materials, tripping, or other hazards attendant to the work being performed. [Order 76-38, § 296-45-67519, filed 12/30/76.]

WAC 296-45-67521 Operator's responsibility. (1) The helicopter operator shall be responsible for the size, weight and manner in which loads are connected to the helicopter.

(a) No load shall be made if the helicopter operator believes the lift cannot safely be performed. The employer shall make certain that the operator of the helicopter is able to freely exercise his prerogative and judgment as to safe operation of the helicopter itself concerning size, weight and manner by which loads are connected.

(2) No employee shall work on, under, near or in conjunction with a helicopter whose operation does not correspond with the foregoing provisions. [Order 76-38, § 296-45-67521, filed 12/30/76.]

WAC 296-45-67523 Hooking and unhooking loads. No employee shall perform work under hovering helicopters: *Provided*, That qualified and capable employees may function under such craft for that limited period of time necessary to guide, secure, hook or unhook the loads. When guiding, securing, hooking or unhooking the load at elevated positions, employees shall be assisted by and use a positive positioning guide system. When under hovering helicopters at any other location, the employee shall have a safe means of ingress and egress, including readily available escape route or routes in the event of an emergency. No other work or work-related activity other than the aforementioned shall be permitted under hovering helicopters. Bolting of or otherwise permanently securing the structures is prohibited under hovering helicopters except that in the event of an unforeseen contingency of an emergency nature which represents a substantial hazard to life or property, an employee may do such work as is necessary to preserve life or protect substantial property. [Order 76-38, § 296-45-67523, filed 12/30/76.]

WAC 296-45-67525 Static charge. All loads shall be grounded with a grounding device capable of discharging either the actual or potential static charge before ground personnel either touch or come close enough to touch the suspended load, or protective rubber gloves shall be worn by all ground personnel either touching the suspended load or who are likely to touch the load. [Order 76-38, § 296-45-67525, filed 12/30/76.]

WAC 296-45-67527 Load permitted. Weight of the external load shall not exceed the manufacturer's load limit.

(1) A helicopter shall not pull any cable, rope or similar line which is at any point attached to a fixed object other than the helicopter itself. Helicopters may pull a free-wheeling sock line so long as the end of the sock line is not tied to a reel, truck, or other fixed object. Such line cannot be tied to or otherwise secured to the roll-off reel other than by having been wrapped around

such reel. [Order 76-38, § 296-45-67527, filed 12/30/76.]

WAC 296-45-67529 Visibility. Employees shall keep clear of and outside the downwash of the helicopters except as necessary to perform a permitted activity. Where reasonably practicable, reduced vision of the operator and ground crew shall be eliminated. [Order 76-38, § 296-45-67529, filed 12/30/76.]

WAC 296-45-67531 Signal systems. Communication shall be maintained between the air crew and ground personnel at all times. Such signal systems shall be understood by the air crew and the ground crew, including signalmen, prior to the hoisting of any load. There shall be constant radio and hand signals used. The signalman shall have the sole and exclusive function during periods of loading and unloading of signaling and maintaining communications with the pilot. The signalman shall be so dressed as to make his appearance distinguishable from other members of the ground crew by the operator of the craft. This may be by way of orange-colored gloves, vest, or other wearing apparel. In addition, the foreman and one top man shall also have an operating transmitter and receiver.

(1) Designated employees may come within 50 feet of the helicopter when the rotor blades are turning, but no closer, other than to enter the craft or to hook or unhook the load or do other essential functions. Other employee(s) shall not come closer than 100 feet of the craft when it is operating. [Order 76-38, § 296-45-67531, filed 12/30/76.]

WAC 296-45-67533 Approaching the helicopter. Whenever approaching or leaving a helicopter with blades rotating, all employees shall remain in full view of pilot or operator and remain in a crouched position if within 50 feet of the helicopter. No employee shall approach the rear of the helicopter unless directly authorized and directed by the operator of such craft to be there at that time. All employees when operating or working within 50 feet of the helicopter with blades turning are subject to the direction of the helicopter operator. No employee shall enter or leave the helicopter unless and until the place at which they enter or leave such craft is large enough for the helicopter itself to land. [Order 76-38, § 296-45-67533, filed 12/30/76.]

WAC 296-45-67535 In helicopter. (1) While in the helicopter, safety belts will remain fastened at all times except when pilot or operator instructs otherwise or while entering or leaving the helicopter.

(2) No smoking in the helicopter unless otherwise permitted by the pilot.

(3) All rack cargo will be secured prior to and during takeoff and flight.

(4) All internal cargo will be secured or otherwise held.

(5) No gear shall be thrown toward or placed in front of the cockpit on or near plexiglass enclosure.

(6) No employee shall lean against or rub the plexiglass.

(7) No employee shall ride in or work under or near a helicopter with less than 15 minutes reserve fuel.

(8) No employee shall have sharp objects in his pocket while sitting in or on the helicopter.

(9) No employee shall touch any switch, knob, instrument, or other control or device in the cockpit unless specifically directed by the operator.

(10) No cargo shall be thrown into pans or cargo rack.

(11) No employee shall obscure or otherwise obstruct the pilot's ability to visually see the instruments or flight path during flight or operation.

(12) No employee shall attempt to slow or stop the rotorcraft blades by hand unless directed or instructed to do so and aided by the pilot. [Order 76-38, § 296-45-67535, filed 12/30/76.]

WAC 296-45-67537 Sling and rigging. (1) The sling used for the external load shall be inspected each day before use. An employee designated as rigger, who shall be capable of properly inspecting the rigging, shall inspect the sling.

(2) No sling shall be used unless it has a minimum tensile strength of four times the load which will be carried or is being carried.

(3) No sling shall be used unless upon inspection it is determined to be in good condition and capable of the work which is to be performed. [Order 76-38, § 296-45-67537, filed 12/30/76.]

WAC 296-45-67539 Personnel. All ground personnel shall be physically and mentally able to perform the work to which they are assigned, including being knowledgeable in these rules. There shall be a sufficient number of ground personnel so as to be able to safely guide, secure, hook and unhook the load. [Order 76-38, § 296-45-67539, filed 12/30/76.]

WAC 296-45-67541 Fires. Open fires shall not be permitted in any area in which said fires will be affected by the downwash of the rotors, nor shall any employee smoke in an area subject to the downdraft of the rotor. [Order 76-38, § 296-45-67541, filed 12/30/76.]

WAC 296-45-67543 General. No employee shall work under or in the near vicinity of helicopters unless the operator has a valid license for operating the craft, knows the signals to be used, has been present at the last briefing held and knows these rules. No employee shall work under or near such craft if the operator is under the influence of intoxicating beverages or prescription medications which affect his ability, nor shall any employee work under or near such craft if the operator is careless or engages in any negligent or reckless operation of the helicopter. [Order 76-38, § 296-45-67543, filed 12/30/76.]

Chapter 296-46 WAC

SAFETY STANDARDS—INSTALLING ELECTRIC WIRES AND EQUIPMENT—ADMINISTRATIVE RULES

WAC

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DISPOSITION OF SECTIONS FORMERLY CODIFIED IN THIS CHAPTER

296-46-010, 296-46-020, 296-46-030, 296-46-040, 296-46-050, 296-46-060. [Filed 9/22/60, effective 12/1/60.] Repealed by Order 69-2, filed 2/28/69, effective 4/1/69.

- 296-46-165 Service ampacity. [Order 72-7, § 296-46-165, filed 6/7/72.] Repealed by Order 74-43, filed 12/19/74.
- 296-46-310 Clothes dryers. [Order 69-2, § 296-46-310, filed 2/28/69, effective 4/1/69.] Repealed by Order 72-7, filed 6/7/72.
- 296-46-330 Bathroom receptacles. [Order 69-2, § 296-46-330, filed 2/28/69, effective 4/1/69.] Repealed by Order 72-7, filed 6/7/72.
- 296-46-340 Recreation room. [Order 69-2, § 296-46-340, filed 2/28/69, effective 4/1/69.] Repealed by Order 74-43, filed 12/19/74.
- 296-46-410 Conductor termination. [Order 69-2, § 296-46-410, filed 2/28/69, effective 4/1/69.] Repealed by Order 72-7, filed 6/7/72.

Reviser's note: The National Electric Code 1968, A USA Standard, NFPA No. 70-1968 USAC C1-1968 referred to in this chapter was filed in the office of the Code Reviser on February 28, 1969, to become effective April 1, 1969.

Reviser's note: WAC 296-46-260 entitled, "Direct burial cable", was repealed by Order 74-43, filed 12/19/74 and again filed as an amended section by Order 75-25, filed 8/4/75. See WAC 296-46-260 as codified thereto.

WAC 296-46-110 Foreword. These Rules and Regulations are issued by the Electrical Inspection Section of the Department of Labor and Industries under the authority of chapter 19.28 RCW, Electrical Installations Law. The Department is empowered by law to enforce these Rules and Regulations and the National Electrical Code.

The 1975 edition, National Electrical Code, is hereby adopted by reference as part of these Rules and Regulations. The Rules and Regulations are adopted for the safety of the public and are to be used in connection with the 1975 edition of the National Electrical Code. Other codes, manuals and reference works referred to in this code will be available for inspection and review in the office of the Electrical Inspection Section of the Division of Building and Construction Safety Inspection Services, Olympia, during business hours. Where there is any conflict between the Rules and Regulations and the National Electrical Code, the Rules and Regulations shall be observed.

Electrical inspectors will give information as to the meaning or application of the National Electrical Code and these Rules and Regulations, but will not lay out work or act as consultants for contractors, owners or users.

A copy of chapter 19.28 RCW, Electrical Installations Law, may be obtained from the Department of Labor and Industries.

Safe Wiring labels are required and may be obtained at addresses where state electrical inspectors are located. [Order 74-43, § 296-46-110, filed 12/19/74; Order 72-7, § 296-46-110, filed 6/7/72; Order 69-2, § 296-46-110, filed 2/28/69, effective 4/1/69.]

WAC 296-46-120 Workmanship. All electrical wiring and equipment shall be installed in a neat, workmanlike manner. Where applicable non-metallic sheath cables shall follow the lines of the building and be fastened to building structures. Unnecessary, or unnecessarily complicated wiring shall be avoided. See National Electrical Code, Article 110. [Order 72-7, § 296-46-120, filed 6/7/72; Order 69-2, § 296-46-120, filed 2/28/69, effective 4/1/69.]

WAC 296-46-130 Classification of occupancies. (1) Educational Occupancy means a building or that portion thereof used primarily for educational purposes.

(2) Institutional Occupancy shall mean a building or that portion thereof where persons are harbored to receive charitable or other care or treatment or are involuntarily detained and health facilities as defined in Section 517-2 of the National Electrical Code. [Order 72-7, § 296-46-130, filed 6/7/72; Order 69-2, § 296-46-130, filed 2/28/69, effective 4/1/69.]

WAC 296-46-140 Institutional buildings. (1) All plans for new or altered electrical installations in institutional buildings and educational occupancies must be reviewed and approved by the State Health Department, Olympia Airport, Olympia, Washington 98504; Electrical Inspection Section, 319 East 4th Avenue, P.O. Box 207, Olympia, Washington 98504; and the State Fire Marshal's Office, Insurance Building, Olympia, Washington 98504, prior to beginning such installation.

(2) Institutional and Educational occupancies shall be wired in a raceway, or A.L.S. or M.I. cable.

EXCEPTION NO. 1 - For signal and control circuits, other than those circuits defined under emergency systems per National Electrical Code, Section 517-2, and Sections 725-3(a) and 725-4, open cable wiring approved for the purpose shall be permitted for Class 2 signal and control circuits up to 30 volts and 3.2 amperes installed in accordance with Article 725 of the National Electrical Code.

EXCEPTION NO. 2 - Open cable wiring approved for the purpose (NFPA Bulletin No. 71) shall be permitted for Central Station Protective Systems installed and operator manned and supervised in accordance with the National Fire Protection Association Bulletin No. 71, 1970-71 issue. [Order 74-43, § 296-46-140, filed 12/19/74; Order 72-7, § 296-46-140, filed 6/7/72; Order 69-2, § 296-46-140, filed 2/28/69, effective 4/1/69.]

WAC 296-46-150 Other buildings. The following building occupancies shall be wired only with busways or raceways or cable trays, or types CS, SNM, TC, ALS, MI or MC (Metal-clad interlocked armored) cables; subject to the National Electrical Code.

(1) Commercial Buildings: Commercial buildings open to the public and designed, intended or used for the purpose of accommodating 200 or more persons. For determination of such population capacity, the following number of square feet per person shall be applied: for standing capacity, 3 square feet per person for such building areas as rapid transit stations, bus depots, waiting space in motion picture theaters and like buildings; for fixed seating capacity, 6 square feet per person for such building areas as churches, theaters, and like buildings; for all other such commercial buildings, 25 square feet per person.

(a) Provisions of Article 518 of the National Electrical Code governing those occupancies designated will not be recognized.

(2) **Industrial Plants:** Industrial plants, except that open conductors of No. 4/0 or larger size may be installed on insulators not less than 20 feet above floor or working surface level in accordance with Article 320 of the National Electrical Code.

(3) **Multi-Family Occupancy Buildings** (i.e., apartment buildings, hotels, motels and dormitories) of two or more stories, not including basement, shall be wired in accordance with Chapter 3 of the National Electrical Code except feeders and subfeeders in such buildings shall be wired in accordance with the opening paragraph of this rule.

EXCEPTION NO. 1 — For signal and control circuits, other than those defined as Class 1 circuits per National Electrical Code, Sections 725-3(a) and 725-4, open cable wiring approved for the purpose shall be permitted for Class 2 signal and control circuits up to 30 volts and 3.2 amperes installed in accordance with Article 725 of the National Electrical Code.

EXCEPTION NO. 2 — Open cable wiring approved for the purpose (NFPA Bulletin No. 71) shall be permitted for Central Station Protective Systems installed and operator manned and supervised in accordance with the National Fire Protection Association Bulletin No. 71, 1970-71 issue. [Order 75-25, § 296-46-150, filed 8/4/75; Order 74-43, § 296-46-150, filed 12/19/74; Order 72-7, § 296-46-150, filed 6/7/72; Order 69-2, § 296-46-150, filed 2/28/69, effective 4/1/69.]

WAC 296-46-160 Service requirements. The serving utility shall be consulted by the owner, his agent, or the contractor making the installation regarding service entrance location before installing equipment. Provisions for meter, attachment of service drop, or for an underground service lateral shall be made at a location acceptable to the serving utility. The point of attachment for a service drop must permit the clearances required by law. [Order 69-2, § 296-46-160, filed 2/28/69, effective 4/1/69.]

WAC 296-46-170 Clearance of service drop for single family or duplex residences. Notwithstanding Section 230-24 of the National Electrical Code the following requirements shall prevail for service drop clearances for single family or duplex residences. Service drop conductors shall have a vertical clearance of not less than 8 feet from roofs over which they pass except as follows:

EXCEPTION NO. 1 — Where the voltage between conductors does not exceed 300 and the pitch of the roof is not less than one in three, the clearance shall not be less than 3 feet.

EXCEPTION NO. 2 — The clearance of service drop conductors of 300 volts or less over roofs having a pitch of less than one in three may be less than 8 feet but not less than 3 feet provided:

(a) Cable approved for such purpose is used having the ungrounded conductors insulated with rubber, thermosplastic or equivalent.

(b) The roof is not accessible by permanent convenient means.

(c) The service entrance is located so as to limit over the roof distance to the practicable minimum length

with the service drop originating at a pole designated by the servicing agency. When in doubt, consult the serving agency as to the pole designation and the electrical inspector as to the minimum practicable length.

EXCEPTION NO. 3 — Service drop conductors of 300 volts or less may have a minimum clearance of 18 inches from that portion of the roof over which they pass when not more than 4 feet from the point of attachment. [Order 69-2, § 296-46-170, filed 2/28/69, effective 4/1/69.]

WAC 296-46-180 Meter location. Except as otherwise permitted by the serving utility, meter height shall not be more than 7 feet or less than 5 feet above finished grade or floor below the meter. The center of the meter shall be the point of reference. [Order 74-43, § 296-46-180, filed 12/19/74; Order 69-2, § 296-46-180, filed 2/28/69, effective 4/1/69.]

WAC 296-46-190 Current transformers. Unless otherwise specified by the serving utility, current transformer installations for utility billing shall conform to the following.

(1) Current transformers shall be factory installed if in a custom built panel board assembly.

(2) Enclosure furnished for job installation of current transformers shall be at least 9 inches deep and of such size as to permit ready installation of the current transformers on the size of wire used. The minimum nominal size of metal cabinets for this purpose shall be as follows:

No. of C.T.	Max MCM/Leg	Enclosure Size
2	250	18" x 24"
3	250	24" x 32"
2	400	24" x 32"
3	400	30" x 32"
2	750	24" x 36"
3	750	32" x 36"

Consult serving utility regarding enclosures for use with larger conductors.

(3) Secondary instrument transformer conductors for metering will not be permitted in service raceway. [Order 69-2, § 296-46-190, filed 2/28/69, effective 4/1/69.]

WAC 296-46-200 Service entrance conductors. (1) Service entrance conductors shall extend at least 18 inches from the service head to permit connection to the service drop. See National Electrical Code, Section 230-54.

(2) Service entrance conductors shall extend no more than 15 feet inside a building.

(3) Unfused code grade conductors 600 volts or less shall be installed in a metallic raceway when within the lines of the building structure. [Order 74-43, § 296-46-200, filed 12/19/74; Order 73-7, § 296-46-200, filed 5/17/73; Order 69-2, § 296-46-200, filed 2/28/69, effective 4/1/69.]

WAC 296-46-210 Service entrance cable. Service entrance cable may be used in accordance with National Electrical Code Article 338. When used for service entrances, service entrance cable shall not extend more than 18 inches inside the building. [Order 69-2, § 296-46-210, filed 2/28/69, effective 4/1/69.]

WAC 296-46-220 Service entrance equipment. Service equipment shall be readily accessible and shall not be installed in bathrooms, clothes closets, shower rooms, cupboards, attics, nor above washers, or plumbed in fixtures.

Service equipment shall be readily accessible after any subsequent building additions.

Service switches and other equipment exposed to elements of the outside weather shall be rain tight type factory built for the purpose. [Order 72-7, § 296-46-220, filed 6/7/72; Order 69-2, § 296-46-220, filed 2/28/69, effective 4/1/69.]

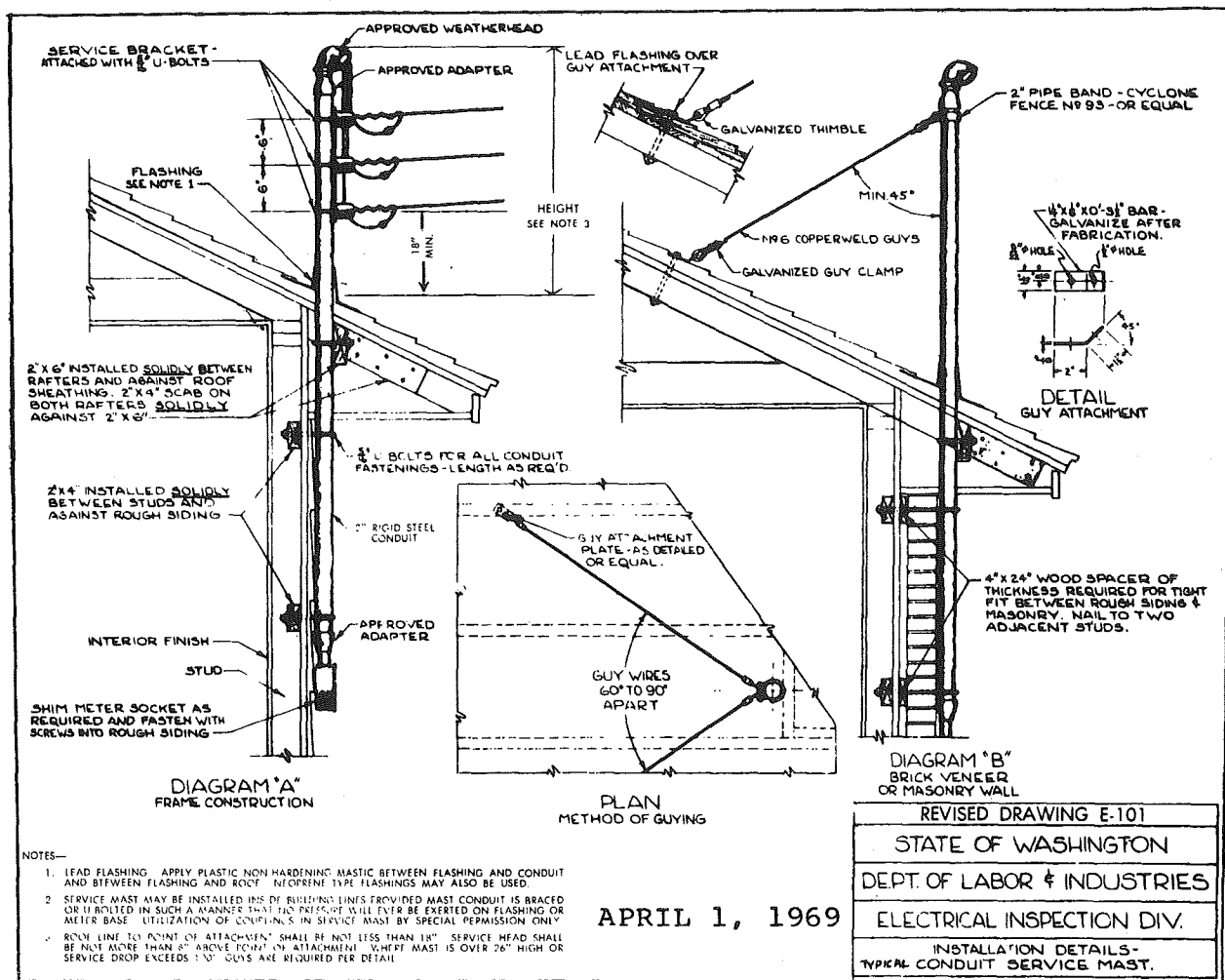
WAC 296-46-230 Service entrance. (1) The size of service entrance installed in a new and/or existing single

family dwelling shall be calculated in accordance with the National Electrical Code, Section 220-10.

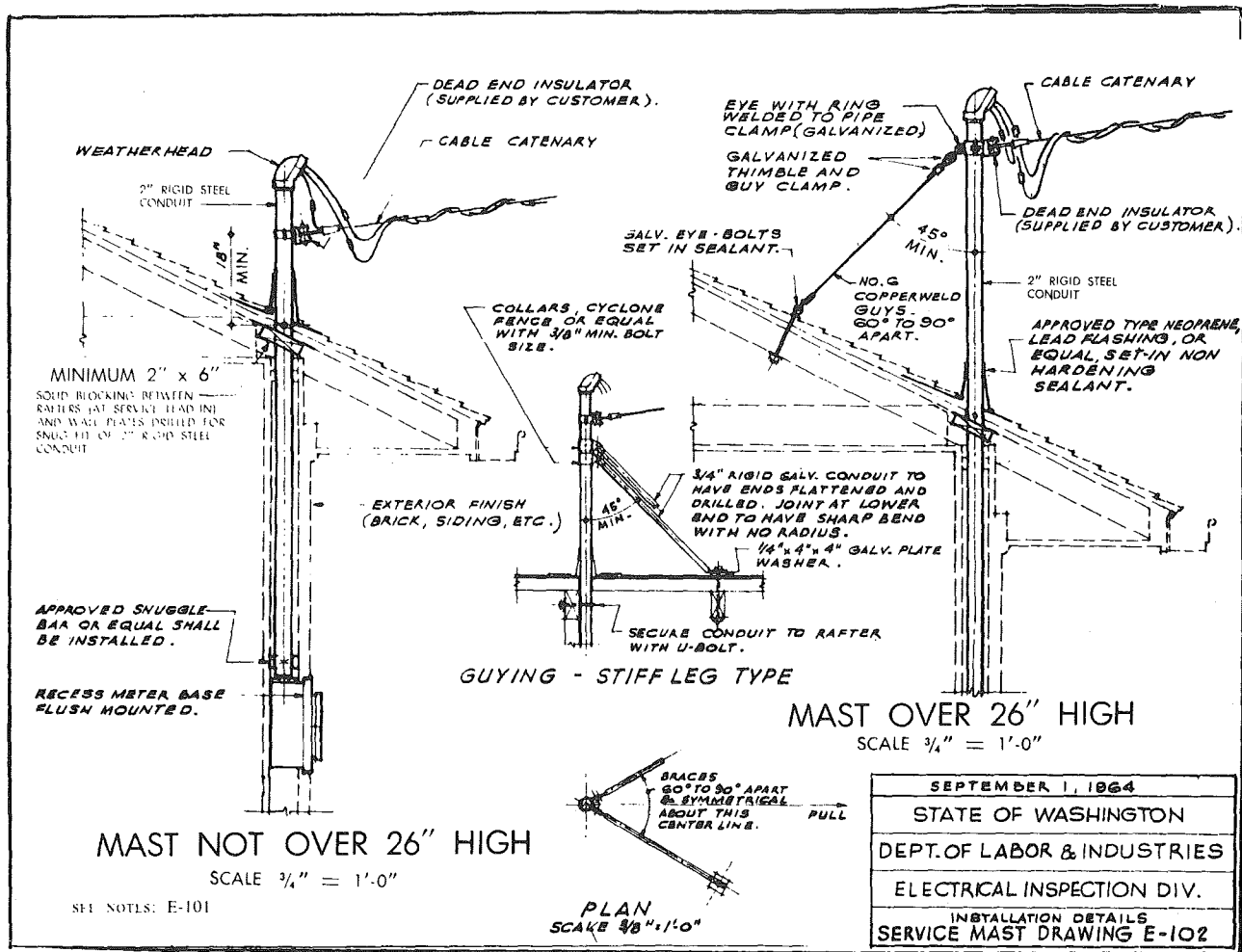
(2) Provisions of Sections 220-30 and 220-31 of the National Electrical Code, optional calculation for additional loads in existing one family dwelling occupancy or individual apartment of multi-family dwelling, will not be recognized.

(3) If any building is moved to a new location, the service entrance must at least meet calculated load requirements in accordance with paragraph (1). [Order 74-43, § 296-46-230, filed 12/19/74; Order 72-7, § 296-46-230, filed 6/7/72; Order 69-2, § 296-46-230, filed 2/28/69, effective 4/1/69.]

WAC 296-46-240 Service mast. A service entrance conduit extended through the roof to provide a means of attaching the service drop shall be no smaller than 2-inch rigid steel galvanized conduit. It shall provide a structurally sound attachment for the service drop and be equipped with a properly installed flashing at the roof line. Installation shall be in accordance with State Drawings E-101 and E-102, or provide equivalent strength by other approved means.



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[Order 69-2, § 296-46-240, filed 2/28/69, effective 4/1/69.]

WAC 296-46-250 Safe wiring label. The service shall not be connected if a "Safe Wiring Label" is not completely and legibly filled out and readily available. [Order 69-2, § 296-46-250, filed 2/28/69, effective 4/1/69.]

WAC 296-46-260 Direct burial cable. (1) Approved direct burial service entrance conductors 600 volts or less shall be buried at least 24 inches, unless covered by permanent mechanical protection such as a pressure treated creosoted board, concrete pad, raceway or equal in which case they shall be buried at least 18 inches. Individual conductors for residential services which are buried without protection shall be bundled to form a single cable.

(2) Direct burial cable shall not be installed in crushed rock fill or similar locations unless centered in 8 inches of sand, or selected backfill. See Section 230-49 and Section 300-5 of the National Electrical Code. [Order 75-25, § 296-46-260, filed 8/4/75; Order 72-7, § 296-46-260, filed 6/7/72; Order 69-2, § 296-46-260, filed 2/28/69, effective 4/1/69.] Repealed by Order 74-43, filed 12/19/74 and later adopted, as amended, by Order 75-25, filed 8/4/75.

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WAC 296-46-265 Conductors of different systems.

(1) Conductors of light and power systems of 600 volts or less may occupy the same enclosure, without regard to whether the individual circuits are alternating-current or direct-current, only where all conductors are insulated for the maximum voltage of any conductor within the enclosure.

(2) Conductors of light and power systems of over 600 volts shall not occupy the same raceway or panelboard with conductors of light and power systems of 600 volts or less. This article supersedes National Electrical Code Article 300-3(b).

(3) Secondary wiring to electric-discharge lamps of 1,000 volts or less, insulated for the secondary voltage involved, may occupy the same fixture enclosure as the branch-circuit conductors.

(4) Primary leads of electric-discharge lamp ballasts, insulated for the primary voltage of the ballast, when contained within the individual wiring enclosure may occupy the same fixture enclosure as the branch-circuit conductors.

(5) Excitation, control, relay and ammeter conductors used in connection with any individual motor or

starter may occupy the same enclosure as the motor-circuit conductors.

(6) Conductors of signal or radio systems shall not occupy the same enclosure with conductors of light or power systems except as permitted for elevators in Section 620-36; for sound recording in Section 640-6; for remote-control, low-energy power and signal circuits in Sections 725-15 and 725-38; and communication system in Sections 800-3 and 800-21 as permitted for fire protective signaling circuits in Sections 760-15 and 760-28. [Order 74-43, § 296-265 (codified as WAC 296-46-265), filed 12/19/74.]

WAC 296-46-270 Metallic plumbing lines. All metallic water lines including waste systems, shall be bonded together by approved means and, unless a buried section of pipe meeting the requirements of Section 250-81, National Electrical Code, is included, shall be connected to an approved grounding electrode. See fine print note, Section 250-81 of the National Electrical Code. [Order 69-2, § 296-46-270, filed 2/28/69, effective 4/1/69.]

WAC 296-46-280 Garbage disposal, waste disposal or waste compactor appliances and dishwasher circuits. Except as otherwise provided in this section, a separate circuit of 20 ampere capacity or larger shall be provided to serve each dishwasher. One garbage disposal unit and/or one waste compactor may be supplied from a three wire circuit of 20 amperes or larger also supplying the dishwasher. If not thus supplied, each disposal or compactor appliance shall be supplied by a separate circuit of 15 amperes or larger. A separate circuit of 20 amperes or larger may supply one garbage disposal unit and one compactor unit provided no other appliances are connected to the circuit. [Order 72-7, § 296-46-280, filed 6/7/72; Order 69-2, § 296-46-280, filed 2/28/69, effective 4/1/69.]

WAC 296-46-290 Range circuit. The branch circuit for a standard free standing electric range 50 amperes or less (other than wall mounted ovens or counter mounted cooking units) shall terminate in an approved flush or surface type plug-in device elevated at least 2 inches above the floor. Minimum circuit capacity for above circuits shall be 50 amperes. [Order 69-2, § 296-46-290, filed 2/28/69, effective 4/1/69.]

WAC 296-46-300 Water heaters. Electric water heaters shall be provided with a circuit suitable for the load, but for those in excess of 9 amperes, the conductor shall not be smaller than 10 A.W.G. copper or equivalent with ground wire for grounding the tank as per Section 250-95, National Electrical Code.

Cover plates to thermostats and controls for water heaters must be accessible for maintenance and repair after the water heater has been installed. [Order 75-25, § 296-46-300, filed 8/4/75; Order 74-43, § 296-46-300, filed 12/19/74; Order 69-2, § 296-46-300, filed 2/28/69, effective 4/1/69.]

WAC 296-46-320 Electric heating. (1) In accordance with the National Electrical Code, Section 215-5, where electric heating is to be installed, heat loss calculations and plans will be required whenever it appears necessary in order to assure the safe operation of the electric heating equipment or when diversity is requested.

These calculations shall be made in accordance with one of the following:

(a) Appendix A where applicable.

(b) The local serving utility heat loss calculations when based on the 1972 edition of ASHRAE GUIDE, Handbook of Fundamentals.

(c) The 1972 edition of the American Society of Heating, Refrigeration and Air Conditioning Engineers Handbook of Fundamentals, (ASHRAE 1972 Handbook of Fundamentals), manuals and guides from National Environmental Systems Contractors Association (NESCA-Manual J. 1967), Hydronics Institute (Heat Loss Calculation Guide H-21, October 1972), National Electrical Manufacturers Association Guide (NEMA-Electric Comfort Heating HE-1966).

(d) Any published heat loss tables based on ASHRAE GUIDE and approved by the Department of Labor and Industries.

(2) The submitter of heat loss calculations shall provide satisfactory evidence in writing from the general contractor, financing institution and/or owner stipulating in the "R" value of the insulation (insulation material only) that will be installed and where it is to be located.

(3) Line voltage double circuit thermostats to control two electric heating circuits shall not be permitted. The Department of Labor and Industries has the right to review and rule on the use of new line voltage controls submitted by the manufacturers for the purpose of controlling two or more electric heating circuits.

(4) Line voltage electric heating control devices, if not approved for continuous load, shall be derated to 80 per cent of rated capacity.

(5) Residential and Residential Multiple Occupancy Structures:

(a) Heat loss calculations shall be based on a minimum of 70 degrees F. indoor temperature with an outdoor design temperature as indicated in Appendix B, except that special application justifying the use of different design temperatures may be approved.

(b) Heat loss calculations for common ceilings, walls or floors separating living spaces from garages and carports shall be considered the same as outside exposure for calculation purposes.

(c) Heat loss calculations for common interior walls and floors separating adjoining living units of multiple occupancy structures shall be based on a minimum of 10° temperature difference. Common interior ceilings separating adjoining living units of multiple occupancy structures shall be based upon a minimum of 20° temperature difference, except that radiant ceilings shall be based on a minimum of 50° temperature difference.

(d) Structures designed with unheated interior spaces adaptable for future use shall have adequate service entrance and service equipment ampacity to provide electric heat for that space. In calculating the additional capacity needed to adequately heat these spaces, insulation values no higher than that installed in the finished spaces shall be used. (If ducts from a central system are installed for the purpose of heating an interior space adaptable for future use, the system shall be sized to include the heat loss of that space).

(e) Electric heating equipment shall be installed to meet or exceed the calculated heat loss in all new structures and existing structures which are converted to electric heat.

(i) The minimum demand factor of 75 per cent of the installed heating capacity may be used in sizing service entrance equipment when electric service is provided through a single panel.

(f) Where electric heat is used in a supplemental or auxiliary capacity, or where electric heating is installed in garages, patios, workshops, storage areas, and other incidental applications, heat loss calculations will not be required.

(g) An automatic temperature regulating device shall be installed to provide effective control of a heated space except for bathroom heaters designed for manual switch operation.

(i) Heated space shall be interpreted to mean: An entire space which is effectively separated from another by means of partition walls and/or doors, even though small permanent openings such as pass throughs and passage ways may exist.

(ii) Effective control shall be interpreted to mean: Not more than one automatic temperature regulating device to control all heating equipment in any heated space. (Applications outlined in subdivision 5-f are excluded). An additional control may be used for regulating the temperature in adjoining stairways and entries where necessary due to design and/or exposure conditions. Special control applications justifying deviations from the above shall be subject to approval.

(h) Heat loss shall be calculated for ductwork or piping installed in vented attics, crawl spaces and unheated garages when central electric systems are to be installed.

(i) Heat loss calculations for radiant ceilings shall be based on a minimum of 100°F. ceiling temperature.

(6) Commercial and Industrial Electric space heating:

(a) When required by the Department of Labor and Industries or when diversity is requested on sizing service entrance equipment, heat loss calculations and plans shall be submitted.

(b) A minimum demand factor of 75 per cent of the installed space heating capacity used exclusively for heating may be used in sizing service entrance equipment if all the following conditions are met:

(i) Heat loss calculations shall be computed in accordance with subdivision 1-b, c or d where applicable.

(ii) Sections 2, 3 and 4 shall be complied with.

(iii) Heating capacity installed meets or exceeds the submitted heat loss calculations.

(iv) Where electric heating equipment is controlled by three or more automatic temperature regulating devices.

(c) The indoor temperature used for the purpose of calculating heat losses may vary according to the established use factor of the spaces involved. [Order 74-43, § 296-46-320, filed 12/19/74; Order 73-7, § 296-46-320, filed 5/17/73; Order 72-7, § 296-46-320, filed 6/7/72; Order 69-2, § 296-46-320, filed 2/28/69, effective 4/1/69.]

WAC 296-46-335 Unfinished areas. Space suitable for future living areas shall have circuits terminated or accessible for future electrical rough-in in accordance with the National Electrical Code, Chapter 3. [Order 74-43, § 296-46-335, filed 12/19/74; Order 72-7, § 296-46-335, filed 6/7/72.]

WAC 296-46-350 Emergency systems. See Article 700, National Electrical Code. Emergency systems shall comply with the 1970 issue of the National Fire Protection Association Bulletin 101, Building Exits Code. Notwithstanding Section 700-10, National Electrical Code, separate emergency service conductors shall be provided and may be tapped on the load side of the electric utility metering equipment provided they are sufficiently separated and effectively fireproofed from the main service disconnecting means to prevent simultaneous interruption of supply through an occurrence within the building or group of buildings served.

Emergency Systems: Exit and emergency lights in auditorium and including corridors must be installed where the seating capacity is 200 or more. The seating capacity will be determined by allowing a basis of 6 square feet per person. [Order 72-7, § 296-46-350, filed 6/7/72; Order 69-2, § 296-46-350, filed 2/28/69, effective 4/1/69.]

WAC 296-46-360 Carnivals, circuses and traveling shows. Wiring methods shall comply with Chapter 3 of the National Electrical Code.

(1) Secondary feeders shall be a type approved for the purpose. Type "S" Cable or equal.

(2) Each concession shall be considered in a single occupancy, and a separate enclosed externally operable fused switch or circuit breaker shall be provided. [Order 69-2, § 296-46-360, filed 2/28/69, effective 4/1/69.]

WAC 296-46-370 Boat moorages and similar installations. In addition to complying with Article 555, National Electrical Code, there shall be a disconnect for all services of 600 volts or less for docks, wharves, boat moorages, etc. located at the shoreline, street side of the first point of building construction in compliance with WAC 296-46-200, subsection 2. [Order 75-25, § 296-46-370, filed 8/4/75; Order 72-7, § 296-46-370, filed 6/7/72; Order 69-2, § 296-46-370, filed 2/28/69, effective 4/1/69.]

WAC 296-46-380 Rockcrushers. Except when wired in an approved metallic system, rockcrushers shall be wired with approved "rough usage" flexible cable having a grounding conductor as an integral part of the cable assembly and with approved connector bodies and caps. The grounding conductor must be brought to the

main panel grounding bus or electrode. [Order 69-2, § 296-46-380, filed 2/28/69, effective 4/1/69.]

WAC 296-46-390 Woodworking plants. The production areas of saw mills and commercial and industrial woodworking plants shall be wired in rigid conduit, M.I. cable or approved armor lock cable, or, if not subject to mechanical injury or vibration, E.M.T. with compression ring fittings or A.L.S. cable. [Order 69-2, § 296-46-390, filed 2/28/69, effective 4/1/69.]

WAC 296-46-400 Mobile homes. (For fee purposes) Mobile homes shall be considered as single family residences. Four or more locations for mobile homes, travel trailers or coaches shall be considered a mobile home park. [Order 69-2, § 296-46-400, filed 2/28/69, effective 4/1/69.]

WAC 296-46-401 License fee. The fee for an electrical contractor's license shall be one hundred and fifty dollars. [Order 71-17, § 296-46-401, filed 12/7/71.]

WAC 296-46-40101 Administrator fees.

- (1) Qualifying Certificate Examination \$50
- (2) Reexamination Fee (within 30 days) \$15
- (3) Certificate Renewal (annual) \$20

[Order 74-43, § 296-46-401, (codified as WAC 296-46-40101), filed 12/19/74.]

WAC 296-46-402 Fees. For fee calculation purposes amperage will be based on conductor ampacity. Voltage will be based on service conductor voltage as per National Electrical Code, Article 230-201, or load side of transformer.

**INSPECTION FEES SHALL BE PAID
PRIOR TO CONNECTION
BY SERVING UTILITY**

*(1) The fee for new services shall be computed as follows:

AMPS	SINGLE MULTI-FAMILY RESIDENT (Each Dwelling Unit)		OTHER THAN RESIDENTIAL		
	1 phase	1 phase	3 phase	3 phase	601 & Over Volts
1- 100	\$ 16.00	\$ 16.00	\$ 16.00	\$ 16.00	\$ 32.00
101- 200	20.00	20.00	24.00	32.00	56.00
201- 300	24.00	24.00	36.00	48.00	88.00
301- 400	32.00	32.00	52.00	64.00	124.00
401- 500	40.00	40.00	68.00	84.00	160.00
501- 600	56.00	56.00	84.00	104.00	192.00
601- 800	64.00	64.00	96.00	120.00	228.00
801-1200	76.00	76.00	112.00	140.00	264.00
1201-1600		80.00	120.00	152.00	280.00
1601-2000		84.00	123.00	160.00	300.00
2001-2500		92.00	136.00	168.00	316.00
2501-3000		96.00	144.00	180.00	332.00

AMPS	SINGLE MULTI-FAMILY RESIDENT (Each Dwelling Unit)		OTHER THAN RESIDENTIAL		
	1 phase	1 phase	3 phase	3 phase	601 & Over Volts
3001-4000		100.00	152.00	188.00	352.00
4001-5000		104.00	160.00	200.00	376.00
5001-6000		112.00	168.00	212.00	396.00

(2) Where a high voltage primary feeder terminates in a separate building it shall be classed as a separate service.

(3) The fee for the first feeder installations with new services shall be 25% of the fee for service installations of like ampacity with a minimum fee of \$7.

(4) The fee for installation, increase and/or relocation (altered) of an existing service or feeder shall be 50% of the fee for a new service of like ampacity, with a minimum fee of \$10.

(5) The fee for new circuits, circuit extensions, circuit alterations, where the service or feeder is not modified, shall be a total of \$10 for one to four circuits inspected at the same time on the same premises under a single label and \$2 for each additional circuit.

- \$10.00
- Additional Circuits

(6) The fee for sign and outline lighting circuits shall be a total of \$10 for one to four circuits inspected at the same time on the same premises under a single label and \$2 for each additional circuit.

(7) A minimum fee of \$10 shall be charged for each of the following subject to noted limitations.

(a) A temporary construction service for lighting and power of 20 KVA or less. The fee for a temporary construction service in excess of 20 KVA shall be 50% of the fee for a new service installation of like ampacity.

(b) Circuit extension installed for controls and motors for central heating plants such as gas, oil, and electrical furnaces.

(c) Yard pole meter loops or similar isolated metering installations.

(d) Each adjacent farm building served from yard pole other than each residence. Exceptions: Installations exceeding 200 amperes shall be in accordance with the appropriate schedule.

- (e) Transient worker housing per unit.

(8) A minimum fee of \$7 shall be charged for each of the following subject to noted limitations.

(a) Mobile home service connection in a mobile home park.

(b) Mobile home feeder where service is existing in a mobile home park.

(c) Recreational vehicle park each lot to which power is supplied.

(d) Boat space in a boat harbor or marina each berth to which power is supplied.

(e) Calculation of or checking heat calculations, where required.

*(9) Optional fee schedule for service to individual motor(s) will be \$10 per motor for motor rating 25 HP

or less; each additional horse power in excess of 25 HP will be an additional fifty cents per HP, with a maximum of \$100, including an allowance of 5 KVA of auxiliary motor equipment.

(10) In addition to the service and feeder installation fee, the fee for each electrically driven irrigation machine shall be \$15.

Inspections requested for existing electrical facilities will be \$7 for the first hour or fraction thereof and \$20 each additional hour or fraction thereof.

*The optional fee for a new service installation to individual motor(s) may be calculated in accordance with Item (9) above based on HP rating or calculated per the new service amperage schedule Item (1) above whichever is the lesser of the calculation methods so stated. [Order 75-25, § 296-46-402, filed 8/4/75; Order 74-43, § 296-46-402, filed 12/19/74; Order 71-17, § 296-36-402 (codified as WAC 296-46-402), filed 12/7/71.]

WAC 296-46-420 All electrical equipment grounding. All electrical equipment grounding (boxes, service and equipment and provisions for grounding receptacles, etc.) for non-metallic cable systems, shall be completely made up at the time of rough-in. [Order 69-2, § 296-46-420, filed 2/28/69, effective 4/1/69.]

WAC 296-46-424 Residential occupancies, ground fault circuit interrupters. In addition to complying with Article 210, National Electrical Code, there shall be a separate circuit installed and limited to the bathroom and those outdoor receptacles GFCI protected. [Order 75-25, § 296-46-424, filed 8/4/75.]

WAC 296-46-425 Construction sites. Provisions of Section 210-8(b) of the National Electrical Code ground fault circuit interrupters for personnel protection will not be recognized. [Order 74-43, § 296-46-425, filed 12/19/74.]

WAC 296-46-426 Bonding agricultural structures and equipment. In accordance with National Electrical Code, Section 250-23(b), Section 250-24 Exception (2), Section 250-45(d) and Section 250-54, all metallic portions or conductive portions of structures used to house livestock shall have all conductive parts of equipment used in such structures bonded to the common grounding electrode as defined in the National Electrical Code, Section 250-54, concrete slabs shall be considered as a conductive portion. [Order 74-43, § 296-46-426, filed 1/3/75.]

WAC 296-46-450 Grounded neutral conductor. Where services over 600 volts are supplied from multi-ground, neutral system with transformer protection provided by fuses in the primary feeder as provided in the National Electrical Code, Sections 450-3(a) and 3(b), the grounded-neutral conductor shall be connected to a grounding electrode at each transformer location. Where the secondary of the transformer or transformers is grounded, the secondary ground shall be connected to the common-neutral ground. Exception: Will not apply

to industrial distribution systems. [Order 69-2, § 296-46-450, filed 2/28/69, effective 4/1/69.]

WAC 296-46-460 Terminating immediately inside an outside building wall. (1) "Terminating immediately inside an outside building wall" will be interpreted to mean terminating in a junction box or a meter enclosure located in the outside wall of the structure with not more than eight feet of rigid steel conduit within the framed wall. See Appendix C, Drawing E-103, and Appendix D, Drawing E-104.

(2) "Terminating immediately inside the building lines" shall be interpreted to be a maximum of 18 inches rigid steel conduit to the bottom of a J-box, C.T. or meter enclosure. See Appendix C, Drawing E-103(A), and Appendix D, Drawing E-104.

(3) The identified neutral conductor of a service lateral in accordance with the preceding paragraphs may be identified with a yellow jacket.

(4) National Electrical Code, Section 230-44, will be recognized except as stated in paragraph (1) above. [Order 75-25, § 296-46-460, filed 8/4/75; Order 72-7, § 296-46-460, filed 6/7/72; Order 69-2, § 296-46-460, filed 2/28/69, effective 4/1/69.]

WAC 296-46-480 Location of pad mounted transformers. (1) Definition - A pad-mounted transformer installation is an installation of an oil-filled transformer outdoors wherein all bushings, handholes, and live and operating parts are guarded by a solid metal enclosure so secured as to be available to authorize qualified personnel only. This will not prohibit the use of approved glass monitoring devices or properly baffled ventilators.

(2) Where a pad-mounted transformer is to be installed adjacent to a structure of combustible material, it shall not be closer than eight (8) feet minimum. This eight foot separation should be measured from the nearest metal portion of the pad-mounted transformer installation to the nearest building features required to be safeguarded. In the case of overhanging eaves or roof lines of combustible material on standard single story structure, the eight foot measurement should be made in such a way as to provide eight feet of clear space between said eaves and the nearest metal portion of the pad-mounted transformer installed outside a vertical line extended from the ends of the eaves to the ground if this distance is at least eight feet horizontally from a combustible wall. In addition, the grade of the ground at the location of the pad-mounted transformer shall be such that any oil leaking from the transformer will flow away from the building and will not form pools. EXCEPTION: In urban residential areas where improved alleyways are utilized, and where a pad-mounted transformer is to be installed adjacent to a structure of combustible material; it may be not closer than two (2) feet minimum, provided the structure is non-inhabited, such as an automobile garage.

(3) Pad-mounted transformer installations shall not be made nearer than two (2) feet, measured horizontally to a non-combustible building surface having no doors, windows or other openings closer than indicated in paragraph (2).

(4) Pad-mounted transformer installations should not be located where exposed to damage by automobiles, trucks or other mobile type of machinery. Where transformers are installed in areas subject to other than pedestrian traffic, they shall be provided with approved additional guarding. If in question, consult the serving agency or State Electrical Inspector as to safeguarding transformers and selection of their location.

(5) Pad-mounted transformer installations shall meet the requirements for being effectively grounded as provided in Section 250-51, National Electrical Code. [Order 69-2, § 296-46-480, filed 2/28/69, effective 4/1/69.]

WAC 296-46-490 Location of total underground transformers. Enclosures for total underground transformers shall not be located within eight (8) feet of a doorway or fire escape. Adequate space shall be maintained above the total underground transformer enclosure so that a boom may be used to lift the transformer. [Order 69-2, § 296-46-490, filed 2/28/69, effective 4/1/69.]

WAC 296-46-500 Administrative rules, foreword. The State Electricians and Electrical Installations Law, chapter 19.28 RCW, establishes the governor appointed Electrical Advisory Board and a Board of Electrical Examiners and fixes their administrative responsibilities. The Advisory Board's principle function is to assist the director of the Department of Labor and Industries in adopting and promulgating reasonable rules and regulations in furtherance of safety to life and property with respect to electrical installations and appliances. While the Advisory Board will, upon request of the director of the Department of Labor and Industries or the Electrical Inspection Section thereof, aid in the administrative interpretation of the National Electrical Code and the rules and regulations covering standards for electrical installations in the state of Washington, it will not function as a board of appeal 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 installing wires or equipment to convey electric current, or engaged in installing apparatus or appliances to be operated by such current.

The Board of Electrical Examiners principle purpose and function is to establish and administer a written examination for an electrical contractors qualifying certificate and to certify to the director of the Department of Labor and Industries all persons who are entitled to electrical contractors qualifying certificates.

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 electrical installations in the state of Washington or relative to the operation of the Electrical Inspection Section of such department may be heard. [Order 74-43, § 296-46-500, filed 12/19/74.]

WAC 296-46-510 Definitions. Whenever used in these rules, the words:

Advisory Board: Shall mean the Washington State Electrical Advisory Board appointed by the governor pursuant to RCW 19.28.065.

Board: Shall mean the Board of Electrical Examiners.

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 Advisory Board on the last Friday of the first month of each calendar quarter being January, April, July and October.

Board Meeting: Shall mean the quarterly meetings held by the Board on the first Monday of February, May, August and November of each year.

Special Meeting: Shall mean any meeting of the Advisory Board and Board called by the chairman thereof or the Director and held at times other than the regular meetings. [Order 74-43, § 296-46-510, filed 12/19/74.]

WAC 296-46-515 Officers. In addition to the chairman and secretary of the Advisory Board, as provided for by RCW 19.28.065, the Advisory Board shall elect from its members a vice chairman who shall perform all functions of the chairman in his absence.

The board shall select its own chairman and elect from its members a vice chairman who shall perform all functions of the chairman in his absence. [Order 74-43, § 296-46-515, filed 12/19/74.]

WAC 296-46-520 Internal management. The Advisory Board shall adopt written rules of procedure for its internal management which shall include "Roberts' Rules of Order, Revised", copies of which rules of procedure shall be made available to interested persons upon written request. [Order 74-43, § 296-46-520, filed 12/19/74.]

WAC 296-46-525 Duties. (1) The Advisory Board shall study proposed rules and regulations submitted to it by the Director or by the Electrical Inspection Section of the Department and shall make recommendations to the Director concerning their adoption and promulgation.

(2) The Advisory Board shall further develop and submit for consideration to the Director administrative procedures, organizational plans and rules relating to improving the functions of the Electrical Inspection Section.

(3) The Advisory Board shall at each regular or special meeting consider any written proposals made by any persons, firms or corporations for new electrical rules or regulations or for amendments to or repeal of existing electrical rules or regulations or for changes in administrative procedures of the Electrical Inspection Section provided such proposals are submitted in writing to the secretary of the Advisory Board at least fifteen (15) days prior to any such meeting so that the same may be properly included on the agenda for such meeting.

The board shall design an examination which will reasonably insure that electrical contractors qualifying certificate holders are competent to engage in and supervise the work covered by the Statute, chapter 19.28 RCW.

The board shall certify to the Director all persons who are entitled to electrical contractors qualifying certificates. [Order 74-43, § 296-46-525, filed 12/19/74.]

WAC 296-46-530 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 electrical installations in the state of Washington, or relative to the operation of the Electrical Inspection Section of such Department at any regular meeting of the Advisory Board shall present a written request to that effect to the secretary of the Advisory Board at least fifteen (15) days prior to the next regular meeting, setting forth a summary of any and all proposals on which the hearing is requested. [Order 74-43, § 296-46-530, filed 12/19/74.]

WAC 296-46-535 Appearance and practice before advisory board. No person may appear in a representative capacity before the Advisory Board other than the following:

(1) Attorney 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 74-43, § 296-46-535, filed 12/19/74.]

WAC 296-46-540 Solicitation of business unethical. It shall be unethical for persons acting in a representative capacity before the Advisory 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 74-43, § 296-46-540, filed 12/19/74.]

WAC 296-46-545 Standards of ethical conduct. All persons appearing in proceedings before the Advisory 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 Advisory Board may decline to permit such person to appear in a representative

capacity in any proceeding before the Advisory Board. [Order 74-43, § 296-46-545, filed 12/19/74.]

WAC 296-46-550 Appearance by former employee. No former employee of the Advisory Board or member of the attorney general's staff may at any time after severing his employment with the Advisory Board or the attorney general appear, except with the written permission of the Advisory 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 Advisory Board. [Order 74-43, § 296-46-550, filed 12/19/74.]

WAC 296-46-555 Former employee as expert witness. No former employee of the Advisory Board shall at any time after severing his employment with the Advisory Board appear, except with the written permission of the Advisory Board, as an expert witness on behalf of other parties in any proceeding wherein he previously took an active part in the investigation as a representative of the Advisory Board. [Order 74-43, § 296-46-555, filed 12/19/74.]

WAC 296-46-560 Computation of time. In computing any period of time prescribed or allowed by the Advisory Board rules, by order of the Advisory 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 74-43, § 296-46-560, filed 12/19/74.]

WAC 296-46-565 Administrative Procedures Act. All proceedings regarding supplemental rules and regulations shall comply, where applicable, with the provisions of the Administrative Procedures Act, chapter 34.04 RCW, and any amendments thereto. [Order 74-43, § 296-46-565, filed 12/19/74.]

APPENDIX A - RESIDENTIAL HEAT LOSS TABLES.

Table 1

Windows and Doors Watt Loss Factor (Per Square Foot)

Temperature Difference	Doors	
	Single Glass	Double Glass Storm Windows
55°F	18	9.8
60°F	20	11.0
70°F	23	13.0
80°F	26	14.0
90°F	30	16.0
100°F	33	18.0

NOTE: All "Added Insulation" values are for MATERIAL ONLY. R-Values for construction were included in the calculations deriving the watt loss factors in the following tables.

Table 2
Outside Walls (R-3.0)
Frame
Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-7 Added Insulation	R-9 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
55°F	5.4	1.6	1.3	1.2	1.1
60°F	5.9	1.8	1.5	1.4	1.2
70°F	6.8	2.1	1.7	1.6	1.4
80°F	7.8	2.3	2.0	1.8	1.6
90°F	8.8	2.6	2.2	2.0	1.8
100°F	9.8	2.9	2.4	2.2	1.9

Table 3
Outside Walls (R-1.35)
Concrete and Other Masonry Units Above Grade
Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-4 Added Insulation	R-6 Added Insulation	R-9 Added Insulation	R-11 Added Insulation
55°F	12	2.8	2.0	1.6	1.4
60°F	13	3.0	2.2	1.7	1.5
70°F	15	3.5	2.6	2.0	1.8
80°F	18	4.0	3.0	2.3	2.0
90°F	20	4.5	3.3	2.5	2.3
100°F	22	5.0	3.7	2.8	2.5

Table 4
Ceiling (R-1.8)
With Vented Attic Above
Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation*	R-7 Added Insulation*	R-11 Added Insulation*	R-13 Added Insulation*	R-19 Added Insulation*	R-24 Added Insulation*
55°F	9.0(14)	1.8(2.8)	1.3(1.9)	1.1(1.7)	.77(1.2)	.63(1.0)
60°F	9.8(15)	2.0(3.0)	1.4(2.1)	1.2(1.8)	.85(1.3)	.70(1.0)
70°F	11.0(16)	2.3(3.3)	1.6(2.3)	1.4(2.0)	.99(1.4)	.80(1.1)
80°F	13.0(18)	2.7(3.7)	1.8(2.5)	1.6(2.2)	1.1 (1.5)	.93(1.2)
90°F	15.0(20)	3.0(4.0)	2.1(2.7)	1.8(2.4)	1.3 (1.7)	1.0 (1.3)
100°F	16.0(21)	3.3(4.3)	2.3(3.0)	2.0(2.6)	1.4 (1.8)	1.1 (1.4)

* For ceilings with heating cable installations (radiant heat) use figures in parentheses. (Calculated on 100°F ceiling temperature)

Table 5
Ceiling (R-3.0)
Open Beam Construction
With Built-Up Roof
Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-2.5 Added Insulation	R-4 Added Insulation	R-9 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
55°F	5.4	2.9	2.3	1.3	1.2	1.0
60°F	5.9	3.2	2.5	1.5	1.3	1.1
70°F	6.8	3.7	2.9	1.7	1.5	1.3
80°F	7.8	4.3	3.3	2.0	1.7	1.5
90°F	8.8	4.8	3.8	2.2	1.9	1.6

Temperature Difference	No Added Insulation	R-2.5 Added Insulation	R-4 Added Insulation	R-9 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
100°F	9.8	5.4	4.2	2.4	2.1	1.8

Table 6
Floor (R-4.3)
Over Vented Crawl Space
Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-4 Added Insulation	R-7 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
55°F	3.7	1.7	1.3	.98	.87
60°F	4.1	1.9	1.4	1.1	.95
70°F	4.8	2.2	1.6	1.2	1.1
80°F	5.5	2.5	1.9	1.4	1.3
90°F	6.1	2.8	2.1	1.6	1.4
100°F	6.8	3.2	2.3	1.8	1.6

If uninsulated heating ducts or piping is installed in a vented crawl space area and/or if closing of crawl space vents is recommended, then the room to crawl space temperature difference will be reduced; therefore, Table 7 may be used.

Table 7
Floor (R-4.3)
Over Enclosed Unheated Unvented Area
Watt Loss Factor (Per Square Foot)

Temperature* Difference	No Added Insulation	R-4 Added Insulation	R-7 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
55°F	1.9	.85	.65	.49	.44
60°F	2.0	.93	.70	.53	.47
70°F	2.4	1.1	.82	.63	.55
80°F	2.7	1.2	.93	.70	.63
90°F	3.2	1.4	1.1	.80	.70
100°F	3.5	1.6	1.2	.89	.80

* Calculations are based on the assumption that 50% of outdoor temperature difference occurs between heated and unheated space.

Table 8
Floor
Concrete Slab Including
Concrete Walls Below Grade*
NOTE: Watt Loss Factor (Per Lineal Foot - Measure Entire Perimeter)

Temperature Difference	No Added Perimeter Insulation	R-2.5 Added Perimeter Insulation	R-3.75 Added Perimeter Insulation	R-5** Added Perimeter Insulation
55°F	13	12	9.1	6.2
60°F	14	12	9.1	6.2
70°F	17	14	11.0	7.0
80°F	19	16	12.0	7.9
90°F	21	18	13.0	8.8

Temperature Difference	No Added Perimeter Insulation	R-2.5 Added Perimeter Insulation	R-3.75 Added Perimeter Insulation	R-5** Added Perimeter Insulation
100°F	24	20	15.0	10.0

- * Heat loss of slab floor includes loss of any concrete walls below grade.
- ** If basement walls below grade are insulated to the floor with R-5 or greater insulation, use watt loss factor listed under R-5 perimeter insulation.

Table 9

Common Interior Ceilings, Walls or Floors of Multiple Occupancy Structures* Ceilings (R-4.9) Walls (R-3.2) Floors (R-5.9) Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-7 Added Insulation	R-11 Added Insulation	R-14 Added Insulation	
55°F	Ceilings*	1.2 (3.0)	.49(1.2)	.37(.90)	
60°F					
70°F					
80°F					
80°F	Walls**	.90	.28	.21	
90°F					
100°F	Floors**	.50	.22	.17	.15

- * Based on 20° temperature difference (70° minus 50°) across ceiling area. For radiant ceiling installation use figures in parentheses, based on 50° temperature difference (100° minus 50°).
- ** Walls and floors based on 10° temperature difference (70° minus 60°).

Table 10
Infiltration

NOTE: Watt Loss Factor (Per Cubic Foot of Volume)

Temperature Difference	Sunken Basement 1/2 Air Change Per Hour	1 Air Change* Per Hour
55°F	.14	.29
60°F	.16	.32
70°F	.18	.37
80°F	.21	.42
90°F	.24	.47
100°F	.26	.53

- * For rooms with weatherstripped doors and storm windows use 2/3 of these values.

Table 11

Duct Heat Loss Multipliers (Central Systems Only)

NOTE: It is recognized that detailed duct layouts seldom accompany floor plans,

therefore this table is based on average duct design and shall be used to estimate duct heat loss, unless calculation of duct heat loss is based in accordance with formulas outlined in manuals listed in Item 1-b of WAC 296-46-320.

Duct Location	Duct Insulation	Approximate Insulated R-value	Multiplier***
Ducts located in unconditioned spaces such as attics, vented crawl spaces and unheated garages	No Insulation	R-0	0.70
	1/2" duct wrap	R-1.25	0.30
	1" duct wrap	R-2.50	0.20
	1-1/2" duct wrap	R-3.75	0.15
	2" duct wrap or 1" rigid duct insulation	R-5.00	0.10
Ducts located in interior unheated spaces such as basements and unvented crawl spaces**	No Insulation	R-0	0.10

Ducts located in conditioned space - no duct heat loss applicable.

- * Nominal thickness.
- ** Basement shall be considered heated if ductwork and furnace are sized to heat this area.
- *** Multiplier assumes all joints are taped to prevent excess air loss.

Example: A house has a structure heat loss of 10,000 watts. Approximately 60% of the ductwork is located in unconditioned space and is insulated with 1" of duct wrap.

Refer to Heat Loss Calculation Form

- (1) Structure Heat Loss (SHL) = 10,000 Watts
- (2) 1" wrap duct insulation (thickness or R-value)
- (3) Duct heat loss multiplier (Table 11) DHLM = 0.20
- (4) 60% = 0.6 fraction of duct in unconditioned space
- (5) Estimated Duct Heat Loss = SHL (1) X DHLM (3) X Fraction (4) = (10,000) X (0.20) X (0.60) = 1200 Watts
- (6) Total Heat Loss (1 plus 5) = 11,200 Watts

For Central Hydronic Systems

Calculation of piping heat loss for central hydronic systems shall be based on formulas outlined in manuals listed in Item 1-b of WAC 296-46-320.

Table 12

Mobile Home Walls (R-2.2)

Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-7 Added Insulation	R-11 Added Insulation	R-13 Added Insulation
55°F	7.3	2.0	1.3	1.1
60°F	8.0	2.1	1.4	1.2
70°F	9.3	2.5	1.7	1.4
80°F	11.0	2.9	1.9	1.7
90°F	12.0	3.2	2.2	1.9
100°F	13.0	3.6	2.4	2.1

Table 13

Mobile Home Ceiling (R-2.5) Floor (R-2.5)*

Watt Loss Factor (Per Square Foot)

Temperature Difference	No Added Insulation	R-7 Added Insulation	R-11 Added Insulation	R-13 Added Insulation	R-19 Added Insulation
55°F	6.5	1.7	1.2	1.0	.77
60°F	7.0	1.8	1.3	1.1	.82
70°F	8.2	2.2	1.5	1.3	.95
80°F	9.8	2.5	1.7	1.5	1.1
90°F	11.0	2.8	2.0	1.7	1.2
100°F					

* Floor heat loss based on mobile home having skirt-ing around it.

CALCULATION OF WATT LOSS FACTORS

For Insulation R-Values Not Given in Tables

Use the following formula:

$$\text{Watt Loss Factor} = \frac{\text{Temperature Difference}}{3.4 \times \text{Total Resistance}}$$

Where:

Temperature Difference: is the indoor to outdoor temperature difference listed in Appendix B, except for ceiling cable or panel heat add 30° to the temperature difference listed in Appendix B.

Total Resistance: is the sum of the thermal resistance of the basic construction found at the top of each table and the thermal resistance of the insulation material.

EXAMPLE: An open beam ceiling is insulated with R-19 insulation and is located in an area with a design temperature difference of 55°F. Calculate the watt loss factor.

Solution:

Basic construction resistance (Table 5)	=	3.0
Resistance of Insulation		19.0
Total Resistance		22.0

$$\text{Watt Loss Factor} = \frac{\text{Temperature Difference}}{3.4 \times \text{Total Resistance}} = \frac{55}{3.4 \times 22} = 0.74 \text{ Watts/Sq. Ft.}$$

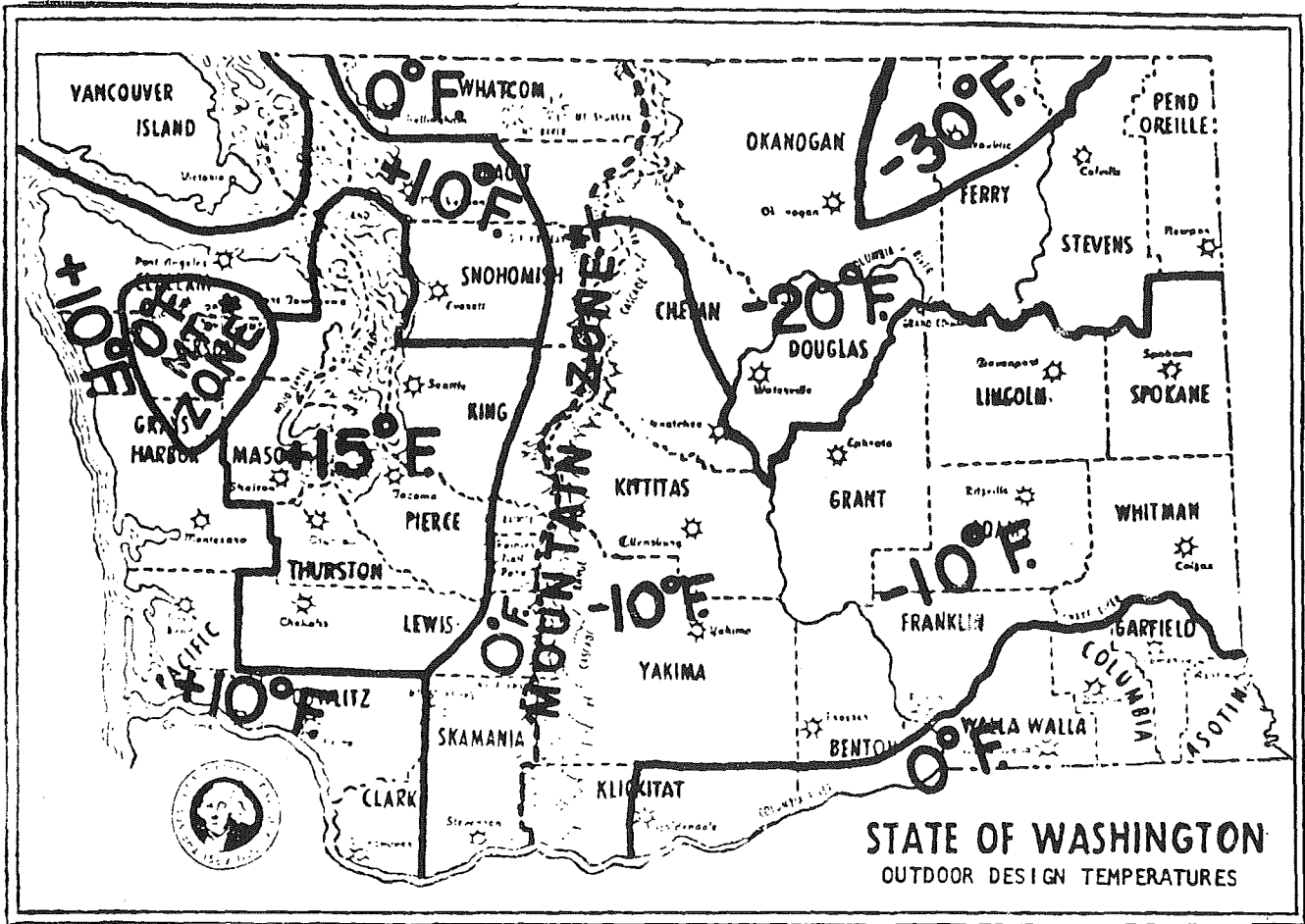
To convert BTU per hour to watts the following formual will apply.

$$\text{Watts} = \frac{\text{BTUH}}{3.413}$$

$$\text{BTUH} = \text{Watts} \times 3.413$$

[Order 72-7, Appendix A—Residential heat loss tables, filed 6/7/72; Order 69-2, Appendix A—Electric heat loss calculation, filed 2/28/69, effective 4/1/69.]

APPENDIX B
OUTDOOR DESIGN TEMPERATURES—CHARTS



*Structures located in the summit areas of the Cascades shall be considered east of the Cascades for calculation purposes.

Mountain zone design temperatures will vary based upon the elevation above sea level, location, and wind conditions. Therefore, some areas may require a colder outdoor design temperature. Consult the local inspecting authority if in doubt.

Outdoor Design Temperature	Design Temperature Difference
+15°F	55°F
+10°F	60°F
0°F	70°F
-10°F	80°F
-20°F	90°F
-30°F	100°F

MULTIPLICATION TABLE FOR SQUARE FEET (INFILTRATION)

[CODIFICATION NOTE: The graphic presentation of these tables has been varied slightly in order that they 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 three tables covering the "Watt Loss Factor Per Square Ft./Lineal Ft." from .15 through 33.0. The first table covers values of 5, 10, 20, 30, 40, 50, 60, 70 & 80 square feet or lineal feet. The second table covers 90, 100, 200, 300, 400, 500, & 600 square feet or lineal feet. The third table covers values of 700, 800, 900, 100, 2000, & 3000 square feet or lineal feet.]

FIRST TABLE

Watt Loss Factor Per Square Ft./Lineal Ft.	Number of Square Feet or Lineal Feet								
	5	10	20	30	40	50	60	70	80
.15	1	2	3	5	6	8	9	11	12
.17	1	2	3	5	7	9	10	12	14
.21	1	2	4	6	8	11	13	15	17
.22	1	2	4	7	9	11	13	15	18
.28	1	3	6	8	11	14	17	20	22
.30	2	3	6	9	12	15	18	21	24
.37	2	4	7	11	15	18	22	26	30

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet								
	5	10	20	30	40	50	60	70	80
.44	2	4	9	13	18	22	26	31	35
.47	2	5	9	14	19	24	28	33	38
.49	2	5	10	15	20	25	29	34	39
.50	3	5	10	15	20	25	30	35	40
.53	3	5	11	16	21	27	32	37	42
.55	3	6	11	17	22	28	33	39	44
.59	3	6	12	18	24	30	35	41	47
.63	3	6	13	19	25	32	38	44	50
.65	3	7	13	20	26	33	39	46	52
.66	3	7	13	20	26	33	40	46	53
.70	4	7	14	21	28	35	42	49	56
.77	4	8	15	23	31	39	46	54	62
.80	4	8	16	24	32	40	48	56	64
.82	4	8	16	25	33	41	49	57	66
.85	4	9	17	26	34	43	51	60	68
.87	4	9	17	26	35	44	52	61	70
.89	4	9	18	27	36	45	53	62	71
.90	5	9	18	27	36	45	54	63	72
.93	5	9	19	28	37	47	56	65	74
.95	5	10	19	29	38	48	57	67	76
.98	5	10	20	29	39	49	59	69	78
.99	5	10	20	30	40	50	59	69	79
1.0	5	10	20	30	40	50	60	70	80
1.1	6	11	22	33	44	55	66	77	88
1.2	6	12	24	36	48	60	72	84	96
1.3	7	13	26	39	52	65	78	91	104
1.4	7	14	28	42	56	70	84	98	112
1.5	8	15	30	45	60	75	90	105	120
1.6	8	16	32	48	64	80	96	112	128
1.7	9	17	34	51	68	85	102	119	136
1.8	9	18	36	54	72	90	108	126	144
1.9	10	19	38	57	76	95	114	133	152
2.0	10	20	40	60	80	100	120	140	160
2.1	11	21	42	63	84	105	126	147	168
2.2	11	22	44	66	88	110	132	154	176
2.3	12	23	46	69	92	115	138	161	184
2.4	12	24	48	72	96	120	144	168	192
2.5	13	25	50	75	100	125	150	175	200
2.6	13	26	52	78	104	130	156	182	208
2.7	14	27	54	81	108	135	162	189	216
2.8	14	28	56	84	112	140	168	196	224
2.9	15	29	58	87	116	145	174	203	232
3.0	15	30	60	90	120	150	180	210	240
3.2	16	32	64	96	128	160	192	224	256
3.3	17	33	66	99	132	165	198	231	264
3.5	18	35	70	105	140	175	210	245	280
3.6	18	36	72	108	144	180	216	252	288
3.7	19	37	74	111	148	185	222	259	296
3.8	19	38	76	114	152	190	228	266	304
4.0	20	40	80	120	160	200	240	280	320
4.1	21	41	82	123	164	205	246	287	328
4.2	21	42	84	126	168	210	252	294	336
4.3	22	43	86	129	172	215	258	301	344
4.4	22	44	88	132	176	220	264	308	352

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet								
	5	10	20	30	40	50	60	70	80
4.5	23	45	90	135	180	225	270	315	360
4.8	24	48	96	144	192	240	288	336	384
5.0	25	50	100	150	200	250	300	350	400
5.4	27	54	108	162	216	270	324	378	432
5.5	28	55	110	165	220	275	330	385	440
5.7	29	57	114	171	228	285	342	399	456
5.9	30	59	118	177	236	295	354	413	472
6.1	31	61	122	183	244	305	366	427	488
6.2	31	62	124	186	248	310	372	434	496
6.3	32	63	126	189	252	315	378	441	504
6.5	33	65	130	195	260	325	390	455	520
6.8	34	68	136	204	272	340	408	476	544
7.0	35	70	140	210	280	350	420	490	560
7.3	37	73	146	219	292	365	438	511	584
7.8	39	78	156	234	312	390	468	546	624
7.9	40	79	158	237	316	395	474	553	632
8.0	40	80	160	240	320	400	480	560	640
8.2	41	82	164	246	328	410	492	574	656
8.8	44	88	176	264	352	440	528	616	704
9.0	45	90	180	270	360	450	540	630	720
9.1	46	91	182	273	364	455	546	637	728
9.3	47	93	186	279	372	465	558	651	744
9.8	49	98	196	294	392	490	588	686	784
10.0	50	100	200	300	400	500	600	700	800
11.0	55	110	220	330	440	550	660	770	880
12.0	60	120	240	360	480	600	720	840	960
13.0	65	130	260	390	520	650	780	910	1040
14.0	70	140	280	420	560	700	840	980	1120
15.0	75	150	300	450	600	750	900	1050	1200
16.0	80	160	320	480	640	800	960	1120	1280
17.0	85	170	340	510	680	850	1020	1190	1360
18.0	90	180	360	540	720	900	1080	1260	1440
19.0	95	190	380	570	760	950	1140	1330	1520
20.0	100	200	400	600	800	1000	1200	1400	1600
21.0	105	210	420	630	840	1050	1260	1470	1680
22.0	110	220	440	660	880	1100	1320	1540	1760
23.0	115	230	460	690	920	1150	1380	1610	1840
24.0	120	240	480	720	960	1200	1440	1680	1920
26.0	130	260	520	780	1040	1300	1560	1820	2080
30.0	150	300	600	900	1200	1500	1800	2100	2400
33.0	165	330	660	990	1320	1650	1980	2310	2640

SECOND TABLE

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet						
	90	100	200	300	400	500	600
.15	14	15	30	45	60	75	90
.17	15	17	34	51	68	85	102
.21	19	21	42	63	84	105	126
.22	20	22	44	66	88	110	132
.28	25	28	56	84	112	140	168
.30	27	30	60	90	120	150	180
.37	33	37	74	111	148	185	222

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet						
	90	100	200	300	400	500	600
.44	40	44	88	132	176	220	264
.47	42	47	94	141	188	235	282
.49	44	49	98	147	196	245	294
.50	45	50	100	150	200	250	300
.53	48	53	106	159	212	265	318
.55	50	55	110	165	220	275	330
.59	53	59	118	177	236	295	354
.63	57	63	126	189	252	315	378
.65	59	65	130	195	260	325	390
.66	59	66	132	198	264	330	396
.70	63	70	140	210	280	350	420
.77	69	77	154	231	308	385	462
.80	72	80	160	240	320	400	480
.82	74	82	164	246	328	410	492
.85	77	85	170	255	340	425	510
.87	78	87	174	261	348	435	522
.89	80	89	178	267	356	445	534
.90	81	90	180	270	360	450	540
.93	84	93	186	279	372	465	558
.95	86	95	190	285	380	475	570
.98	88	98	196	294	392	490	588
.99	89	99	198	297	396	495	594
1.0	90	100	200	300	400	500	600
1.1	99	110	220	330	440	550	660
1.2	108	120	240	360	480	600	720
1.3	117	130	260	390	520	650	780
1.4	126	140	280	420	560	700	840
1.5	135	150	300	450	600	750	900
1.6	144	160	320	480	640	800	960
1.7	153	170	340	510	680	850	1020
1.8	162	180	360	540	720	900	1080
1.9	171	190	380	570	760	950	1140
2.0	180	200	400	600	800	1000	1200
2.1	189	210	420	630	840	1050	1260
2.2	198	220	440	660	880	1100	1320
2.3	207	230	460	690	920	1150	1380
2.4	216	240	480	720	960	1200	1440
2.5	225	250	500	750	1000	1250	1500
2.6	234	260	520	780	1040	1300	1560
2.7	243	270	540	810	1080	1350	1620
2.8	252	280	560	840	1120	1400	1680
2.9	261	290	580	870	1160	1450	1740
3.0	270	300	600	900	1200	1500	1800
3.2	288	320	640	960	1280	1600	1920
3.3	297	330	660	990	1320	1650	1980
3.5	315	350	700	1050	1400	1750	2100
3.6	324	360	720	1080	1440	1800	2160
3.7	333	370	740	1110	1480	1850	2220
3.8	342	380	760	1140	1520	1900	2280
4.0	360	400	800	1200	1600	2000	2400
4.1	369	410	820	1230	1640	2050	2460
4.2	378	420	840	1260	1680	2100	2520
4.3	387	430	860	1290	1720	2150	2580
4.4	396	440	880	1320	1760	2200	2640
4.5	405	450	900	1350	1800	2250	2700

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet						
	90	100	200	300	400	500	600
4.8	432	480	960	1440	1920	2400	2880
5.0	450	500	1000	1500	2000	2500	3000
5.4	486	540	1080	1620	2160	2700	3240
5.5	495	550	1100	1150	2200	2750	3300
5.7	513	570	1140	1710	2280	2850	3420
5.9	531	590	1180	1770	2360	2950	3540
6.1	549	610	1220	1830	2440	3050	3660
6.2	558	620	1240	1860	2480	3100	3720
6.3	567	630	1260	1890	2520	3150	3780
6.5	585	650	1300	1950	2600	3250	3900
6.8	612	680	1360	2040	2720	3400	4080
7.0	630	700	1400	2100	2800	3500	4200
7.3	657	730	1460	2190	2920	3650	4380
7.8	702	780	1560	2340	3120	3900	4680
7.9	711	790	1580	2370	3160	3950	4740
8.0	720	800	1600	2400	3200	4000	4800
8.2	738	820	1640	2460	3280	4100	4920
8.8	792	880	1760	2640	3520	4400	5280
9.0	810	900	1800	2700	3600	4500	5400
9.1	819	910	1820	2730	3640	4550	5460
9.3	837	930	1860	2790	3720	4650	5580
9.8	882	980	1960	2940	3920	4900	5880
10.0	900	1000	2000	3000	4000	5000	6000
11.0	990	1100	2200	3300	4400	5500	6600
12.0	1080	1200	2400	3600	4800	6000	7200
13.0	1170	1300	2600	3900	5200	6500	7800
14.0	1260	1400	2800	4200	5600	7000	8400
15.0	1350	1500	3000	4500	6000	7500	9000
16.0	1440	1600	3200	4800	6400	8000	9600
17.0	1530	1700	3400	5100	6800	8500	10200
18.0	1620	1800	3600	5400	7200	9000	10800
19.0	1710	1900	3800	5700	7600	9500	11400
20.0	1800	2000	4000	6000	8000	10000	12000
21.0	1890	2100	4200	6300	8400	10500	12600
22.0	1980	2200	4400	6600	8800	11000	13200
23.0	2070	2300	4600	6900	9200	11500	13800
24.0	2160	2400	4800	7200	9600	12000	14400
26.0	2340	2600	5200	7800	10400	13000	15600
30.0	2700	3000	6000	9000	12000	15000	18000
33.0	2970	3300	6600	9900	13200	16500	19800

THIRD TABLE

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet					
	700	800	900	1000	2000	3000
.15	105	120	135	150	300	450
.17	119	136	153	170	340	510
.21	147	168	189	210	420	630
.22	154	176	198	220	440	660
.28	196	224	252	280	560	840
.30	210	240	270	300	600	900
.37	259	296	333	370	740	1110

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet					
	700	800	900	1000	2000	3000
.44	308	352	396	440	880	1320
.47	329	376	423	470	940	1410
.49	343	392	441	490	980	1470
.50	350	400	450	500	1000	1500
.53	371	424	477	530	1060	1590
.55	385	440	495	550	1100	1650
.59	413	472	531	590	1180	1770
.63	441	504	567	630	1260	1890
.65	455	520	585	650	1300	1950
.66	462	528	594	660	1320	1980
.70	490	560	630	700	1400	2100
.77	539	616	693	770	1540	2310
.80	560	640	720	800	1600	2400
.82	574	656	738	820	1640	2460
.85	595	680	765	850	1700	2550
.87	609	696	783	870	1740	2610
.89	623	712	801	890	1780	2670
.90	630	720	810	900	1800	2700
.93	651	744	837	930	1860	2790
.95	665	760	855	950	1900	2850
.98	686	784	882	980	1960	2940
.99	693	792	891	990	1980	2970
1.0	700	800	900	1000	2000	3000
1.1	770	880	990	1100	2200	3300
1.2	840	960	1080	1200	2400	3600
1.3	910	1040	1170	1300	2600	3900
1.4	980	1120	1260	1400	2800	4200
1.5	1050	1200	1350	1500	3000	4500
1.6	1120	1280	1440	1600	3200	4800
1.7	1190	1360	1530	1700	3400	5100
1.8	1260	1440	1620	1800	3600	5400
1.9	1330	1520	1710	1900	3800	5700
2.0	1400	1600	1800	2000	4000	6000
2.1	1470	1680	1890	2100	4200	6300
2.2	1540	1760	1980	2200	4400	6600
2.3	1610	1840	2070	2300	4600	6900
2.4	1680	1920	2160	2400	4800	7200
2.5	1750	2000	2250	2500	5000	7500
2.6	1820	2080	2340	2600	5200	7800
2.7	1890	2160	2430	2700	5400	8100
2.8	1960	2240	2520	2800	5600	8400
2.9	2030	2320	2610	2900	5800	8700
3.0	2100	2400	2700	3000	6000	9000
3.2	2240	2560	2880	3200	6400	9600
3.3	2310	2640	2970	3300	6600	9900
3.5	2450	2800	3150	3500	7000	10500
3.6	2520	2880	3240	3600	7200	10800
3.7	2590	2960	3330	3700	7400	11100
3.8	2660	3040	3420	3800	7600	11400

Watt Loss Factor Per Square Ft./ Lineal Ft.	Number of Square Feet or Lineal Feet					
	700	800	900	1000	2000	3000
4.0	2800	3200	3600	4000	8000	12000
4.1	2870	3280	3690	4100	8200	12300
4.2	2940	3360	3780	4200	8400	12600
4.3	3010	3440	3870	4300	8600	12900
4.4	3080	3520	3960	4400	8800	13200
4.5	3150	3600	4050	4500	9000	13500
4.8	3360	3840	4320	4800	9600	14400
5.0	3500	4000	4500	5000	10000	15000
5.4	3780	4320	4860	5400	10800	16200
5.5	3850	4400	4950	5500	11000	16500
5.7	3990	4560	5130	5700	11400	17100
5.9	4130	4720	5310	5900	11800	17700
6.1	4270	4880	5490	6100	12200	18300
6.2	4340	4960	5580	6200	12400	18600
6.3	4410	5040	5670	6300	12600	18900
6.5	4550	5200	5850	6500	12000	19500
6.8	4760	5440	6120	6800	13600	20400
7.0	4900	5600	6300	7000	14000	21000
7.3	5110	5340	6570	7300	14600	21900
7.8	5460	6240	7020	7800	15600	23400
7.9	5530	6320	7110	7900	15800	23700
8.0	5600	6400	7200	8000	16000	24000
8.2	5740	6560	7380	8200	16400	24600
8.8	6160	7040	7920	8800	17600	26400
9.0	6300	7200	8100	9000	18000	27000
9.1	6370	7280	8190	9100	18200	27300
9.3	6510	7440	8370	9300	18600	27900
9.8	6860	7840	8820	9800	19600	29400
10.0	7000	8000	9000	10000	20000	30000
11.0	7700	8800	9900	11000	22000	33000
12.0	8400	9600	10800	12000	24000	36000
13.0	9100	10400	11700	13000	26000	39000
14.0	9800	11200	12600	14000	28000	42000
15.0	10500	12000	13500	15000	30000	45000
16.0	11200	12800	14400	16000	32000	48000
17.0	11900	13600	15300	17000	34000	51000
18.0	12600	14400	16200	18000	36000	54000
19.0	13300	15200	17100	19000	38000	57000
20.0	14000	16000	18000	20000	40000	60000
21.0	14700	16800	18900	21000	42000	63000
22.0	15400	17600	19800	22000	44000	66000
23.0	16100	18400	20700	23000	46000	69000
24.0	16800	19200	21600	24000	48000	72000
26.0	18200	20800	23400	26000	52000	78000
30.0	21000	24000	27000	30000	60000	90000
33.0	23100	26400	29700	33000	66000	99000

MULTIPLICATION TABLE FOR CUBIC FEET

[CODIFICATION NOTE: The graphic presentation of these tables has been varied slightly in order that they 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 three tables covering the "Watt Loss Factor Per Cubic Foot" from .14 through .53. The first table covers values of 100, 200, 300, 400, 500, 600, 700 & 800 cubic feet. The second table covers values of 900, 1000, 2000, 3000, 4000, 5000 & 6000 cubic feet. The third table covers values of 7000, 8000, 9000, 10000, 20000 & 30000 cubic feet.]

FIRST TABLE

Watt Loss Factor Per Cubic Foot	Number of Cubic Feet							
	100	200	300	400	500	600	700	800
.14	14	28	42	56	70	84	98	112
.16	16	32	48	64	80	96	112	128
.18	18	36	54	72	90	108	126	144
.21	21	42	63	84	105	126	147	168
.24	24	48	72	96	120	144	168	192
.26	26	52	78	104	130	156	182	208
.29	29	58	87	116	145	174	203	232
.32	32	64	96	128	160	192	224	256
.37	37	74	111	148	185	222	259	296
.42	42	84	126	168	210	252	294	336
.47	47	94	141	188	235	282	329	376
.53	53	106	159	212	265	318	371	424

SECOND TABLE

Watt Loss Factor Per Cubic Foot	Number of Cubic Feet						
	900	1000	2000	3000	4000	5000	6000
.14	126	140	280	420	560	700	840
.16	144	160	329	480	640	800	960
.18	162	180	360	540	720	900	1080
.21	189	210	420	630	840	1050	1260
.24	216	240	480	720	960	1200	1440
.26	234	260	520	780	1040	1300	1560
.29	261	290	580	870	1160	1450	1740
.32	288	320	640	960	1280	1600	1920
.37	333	370	740	1110	1480	1850	2220
.42	378	420	840	1260	1680	2100	2520
.47	423	470	940	1410	1880	2350	2820
.53	477	530	1060	1590	2120	2650	3180

THIRD TABLE

Watt Loss Factor Per Cubic Foot	Number of Cubic Feet					
	7000	8000	9000	10000	20000	30000
.14	980	1120	1260	1400	2800	4200
.16	1120	1280	1440	1600	3200	4800
.18	1260	1400	1620	1800	3600	5400
.21	1470	1680	1890	2100	4200	6300
.24	1680	1920	2160	2400	4800	7200
.26	1820	2080	2340	2600	5200	7800
.29	2030	2320	2610	2900	5800	8700
.32	2240	2560	2880	3200	6400	9600
.37	2590	2960	3330	3700	7400	11100

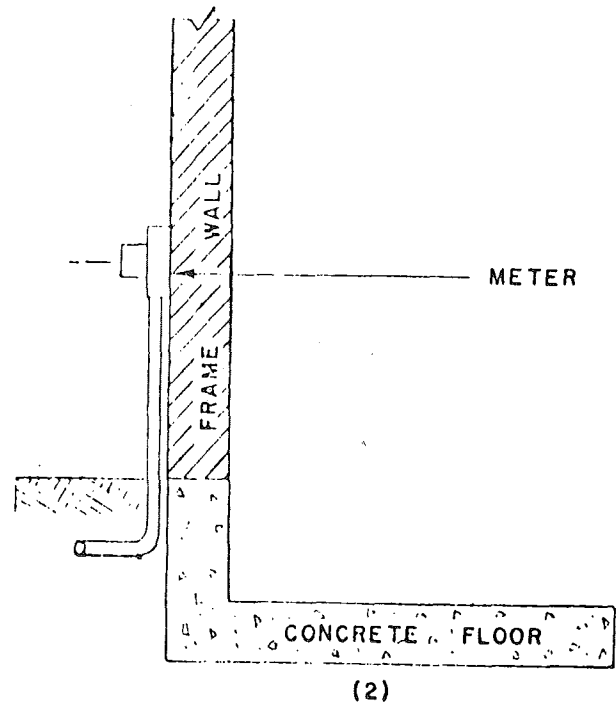
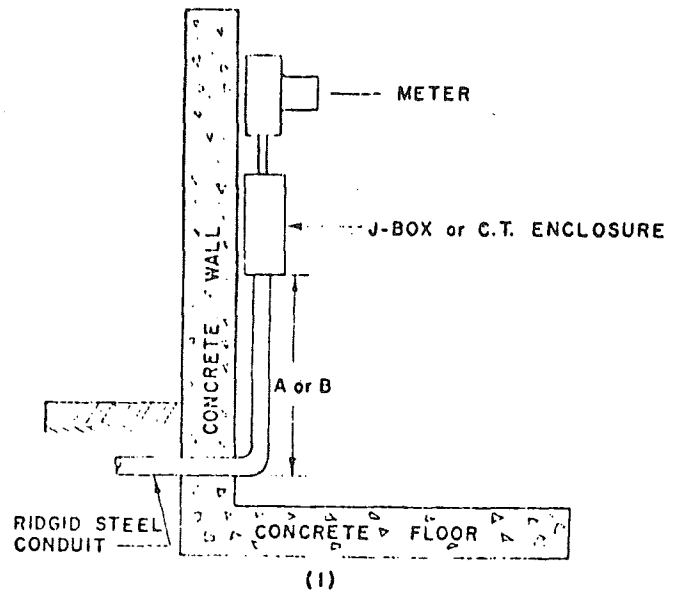
Watt Loss Factor Per Cubic Foot	Number of Cubic Feet					
	7000	8000	9000	10000	20000	30000
.42	2940	3360	3780	4200	8400	12600
.47	3290	3760	4230	4700	9400	14100
.53	3710	4240	4770	5300	10600	15900

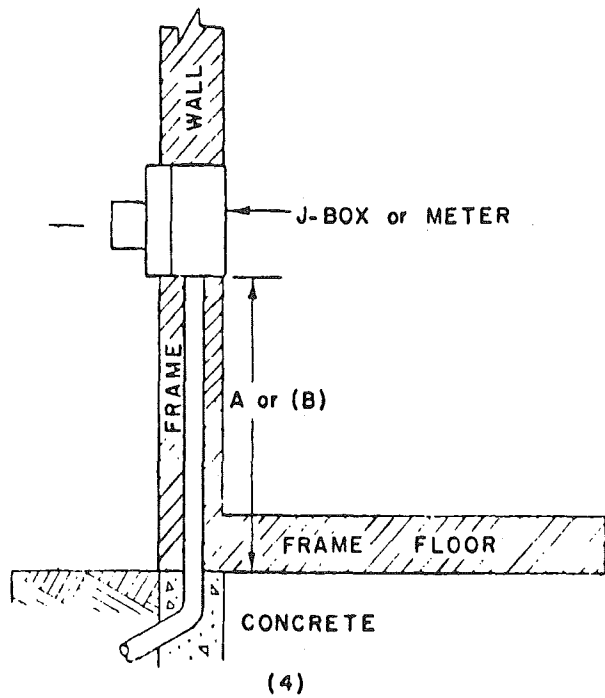
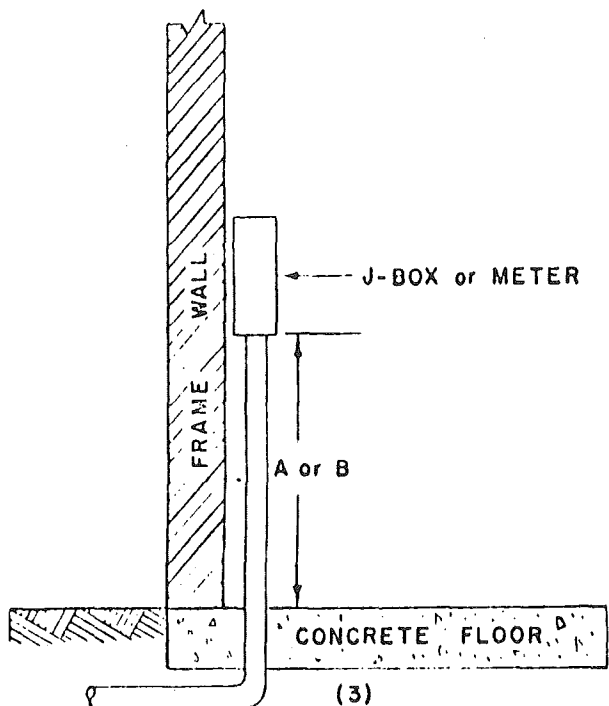
[Order 72-7, Appendix B—Outdoor design temperatures—Charts, filed 6/7/72.]

WAC 296-46-900 Appendix C—Drawing E-103.

APPENDIX C—DRAWING E-103

DISTANCE LIMITATION AS DESCRIBED IN A, B





INTERPRETATION: N.E.C. 90-2 (c) — Termination immediately: J-Box, C.T. or meter enclosure (c). See WAC 296-46-460 paragraphs (1) & (2).

RACEWAYS — All conduit raceways shall be rigid steel only with approved fiber bushing and shall terminate underground a minimum of 24 inches deep.

EXCEPTION: WAC 296-46-460(4)

DISTANCE LIMITATION: A. UTILITY GRADE WIRE — Service Lateral Termination WAC 296-46-460 — As measured maximum, 18 inches if conduit is located inside the structure, or 8 feet if conduit is located in an outside framed wall.

B. CODE GRADE WIRE — Service Entrance Conductors WAC 296-46-200 — As measured maximum 15 feet.

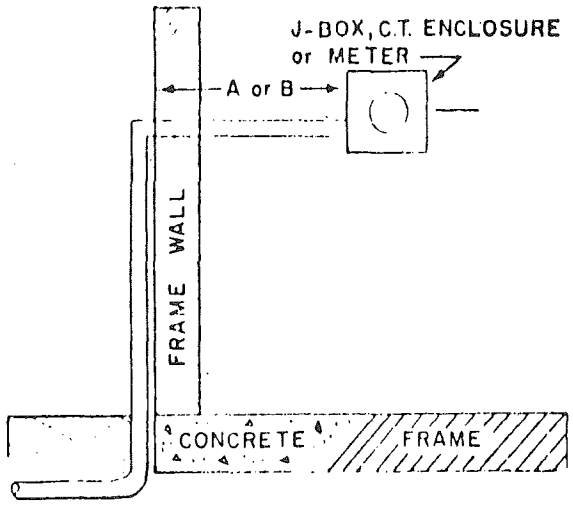
STATE OF WASHINGTON
DEPT. OF LABOR & INDUSTRIES
ELECTRICAL INSPECTION DIV.
UNDERGROUND SERVICE TERMINATIONS
DRAWING E-103

[Order 75-25, Appendix C—Drawing E-103 (codified as WAC 296-46-900), filed 8/4/75; Order 72-7, Appendix C, filed 6/7/72.]

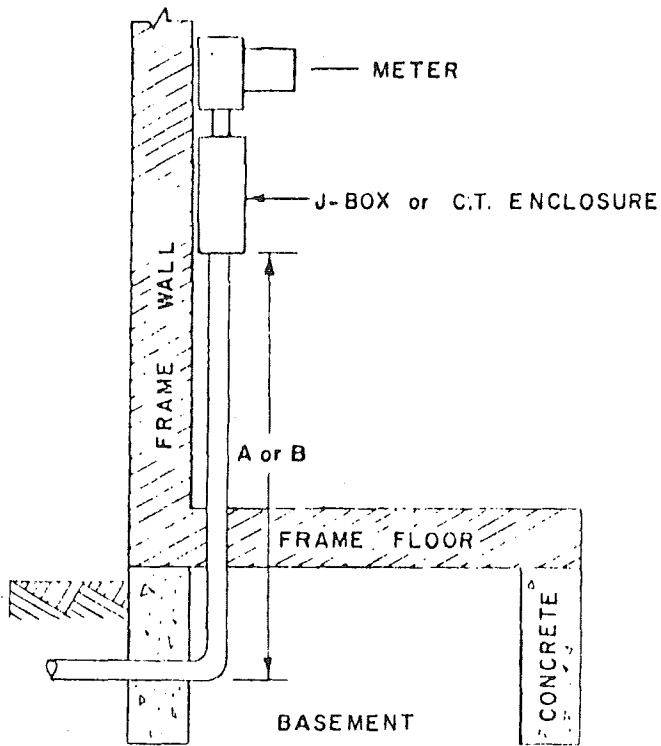
WAC 296-46-905 Appendix D—Drawing E-104.

APPENDIX D—DRAWING E-104

DISTANCE LIMITATION AS DESCRIBED IN A, B

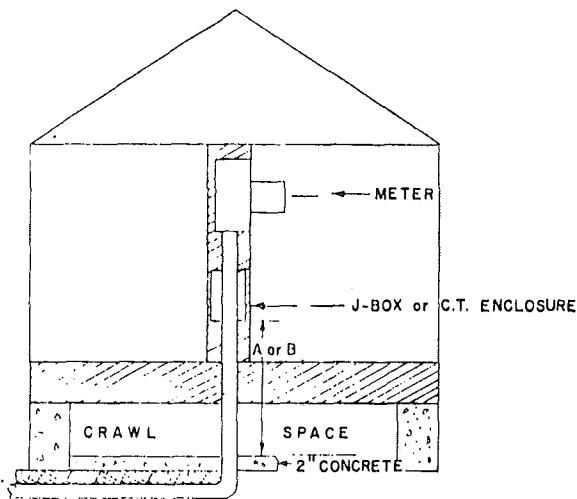


(5)

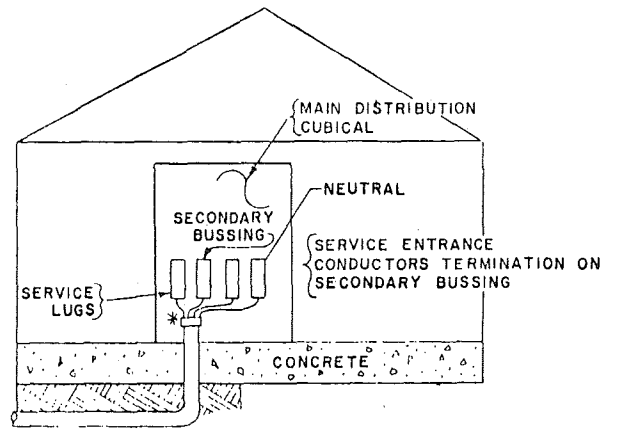


NOTE: EQUIPMENT MAY BE REVERSED AND INSTALLED IN BASEMENT UNDER SAME DISTANCE LIMITATIONS

(6)

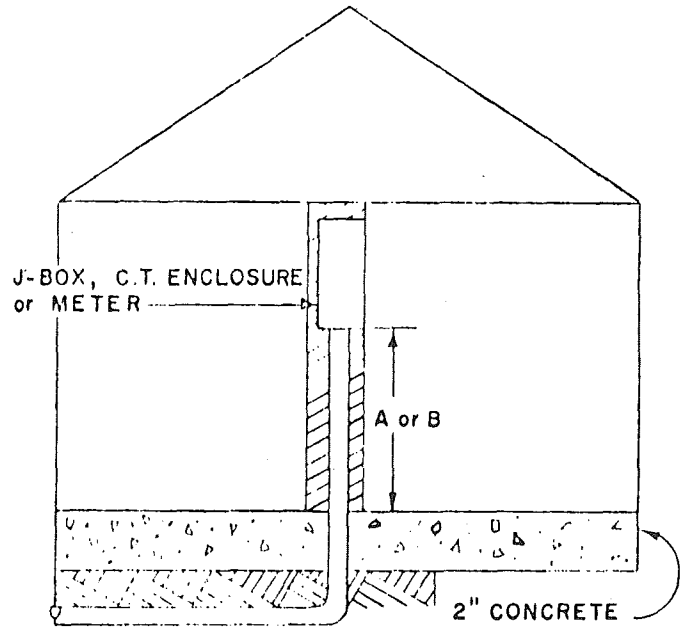


(7)

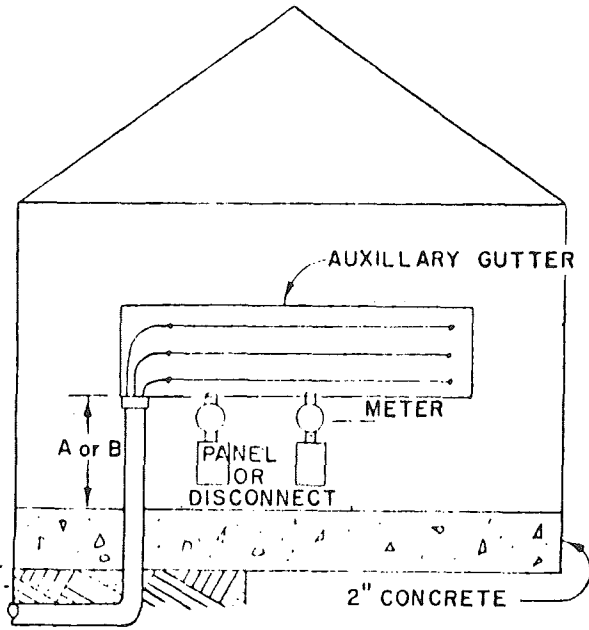


‡ J-BOX, C.T. ENCLOSURE, AUXILLARY GUTTER or METER ENCLOSURE IS THE MAXIMUM TERMINATION OF UTILITY GRADE WIRE. THIS MUST BE CODE GRADE WIRE.

(8)



(9)



(10)

FOR INTERPRETATIONS AND NOTES, SEE
DRAWING E-103

STATE OF WASHINGTON
DEPT. OF LABOR & INDUSTRIES
ELECTRICAL INSPECTION DIV.
UNDERGROUND SERVICE TERMINATIONS
DRAWING E-104

[Order 75-25, Appendix D (codified as WAC 296-46-905), filed 8/4/75; Order 72-7, Appendix D, filed 6/7/72.]

**Chapter 296-47 WAC
ELECTRICAL WIRING & APPARATUS**

Reviser's note: On March 29, 1961, the department of labor and industries filed with the code reviser's office the November 1959 edition of the N.B.F.U. National Electrical Code #70.

On March 31st, the code reviser received a letter from the department stating that such code was adopted [by the department] by the procedure prescribed by law.

It is the custom of this office not to print national safety codes, but rather to leave the distribution of same to the various departments.