

**Title 51 WAC
COMMERCE,
DEPARTMENT OF
(BUILDING CODE
COUNCIL)**

(Formerly: CTED (Building Code Council))

Chapters

- 51-11** Washington State Energy Code 2006 edition.
- 51-51** State Building Code adoption and amendment of the 2006 edition of the International Residential Code.
- 51-54** State Building Code adoption and amendment of the 2006 edition of the International Fire Code.

Chapter 51-11 WAC

WASHINGTON STATE ENERGY CODE 2006 EDITION

WAC

- 51-11-0502 Building envelope requirements.
- 51-11-0503 Building mechanical systems.

WAC 51-11-0502 Building envelope requirements.

502.1 General:

502.1.1: The stated U- or F-factor of any component assembly, listed in Table 5-1, such as roof/ceiling, opaque wall or opaque floor may be increased and the U-factor for other components decreased, provided that the total heat gain or loss for the entire building envelope does not exceed the total resulting from compliance to the U-factors specified in this section.

The U-factors for typical construction assemblies are included in Chapter 10. These values shall be used for all calculations. Where proposed construction assemblies are not represented in Chapter 10, values shall be calculated in accordance with Chapters 23-30 in Standard RS-1 listed in Chapter 7, using the framing factors listed in Chapter 10 where applicable.

For envelope assemblies containing metal framing, the U-factor shall be determined by one of the following methods:

1. Results of laboratory or field measurements.
2. Standard RS-1, listed in Chapter 7, where the metal framing is bonded on one or both sides to a metal skin or covering.
3. The zone method as provided in Chapter 25 of Standard RS-1, listed in Chapter 7.
4. Results of parallel path correction factors effective framing/cavity R-values as provided in Table 10-5A - EFFEC-

TIVE R-VALUES FOR METAL FRAMING AND CAVITY ONLY for metal stud walls and roof/ceilings.

502.1.2: For consideration of thermal mass effects, see section 402.4.

502.1.3: When return air ceiling plenums are employed, the roof/ceiling assembly shall:

a. For thermal transmittance purposes, not include the ceiling proper nor the plenum space as part of the assembly; and

b. For gross area purposes, be based upon the interior face of the upper plenum surface.

502.1.4 Insulation:

502.1.4.1 General: All insulating materials shall comply with sections 2603 and/or 719 of the International Building Code. Substantial contact of the insulation with the surface being insulated is required. All insulation materials shall be installed according to the manufacturer's instructions to achieve proper densities and maintain uniform R-values and shall be installed in a manner which will permit inspection of the manufacturer's R-value identification mark. To the maximum extent possible, insulation shall extend over the full component area to the intended R-value.

Alternatively, the thickness of roof/ceiling and wall insulation that is either blown in or spray-applied shall be identified by inches of thickness, density and R-value markers installed at least one for every 300 square feet (28 m²) through the attic, ceiling and/or wall space. In attics, the markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness and minimum settled thickness with numbers a minimum 1.0 inch (25 mm) in height. Each marker shall face the attic access. The thickness of installed attic insulation shall meet or exceed the minimum initial installed thickness shown by the marker. In cathedral ceilings and walls, the markers shall be affixed to the rafter and wall frame at alternating high and low intervals and marked with the minimum installed density and R-value with numbers a minimum 1.0 inch (25 mm) in height. Each marker shall face the conditioned room area.

502.1.4.2 Insulation Materials: All insulation materials including facings such as vapor barriers or breather papers installed within floor/ceiling assemblies, roof/ceiling assemblies, walls, crawl spaces, or attics shall have a flame spread rating of less than 25 and a smoke density not to exceed 450 when tested in accordance with ASTM E84-01.

EXCEPTIONS:

1. Foam plastic insulation shall comply with section 2603 of the International Building Code.
2. When such materials are installed in concealed spaces of Types III, IV and V construction, the flame spread and smoke developed limitations do not apply to facing, provided that the facing is installed in substantial contact with the unexposed surface of the ceiling, floor or wall finish.
3. Cellulose insulation shall comply with section 719 of the International Building Code.

502.1.4.3 Clearances: Where required, insulation shall be installed with clearances according to manufacturer's specifications. Insulation shall be installed so that required

ventilation is unobstructed. For blown or poured loose fill insulation, clearances shall be maintained through installation of a permanent retainer.

502.1.4.4 Access Hatches and Doors: Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment which prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer must be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation.

502.1.4.5 Roof/Ceiling Insulation: Open-blown or poured loose fill insulation may be used in attic spaces where the slope of the ceiling is not more than 3 feet in 12 and there is at least 30 inches of clear distance from the top of the bottom chord of the truss or ceiling joist to the underside of the sheathing at the roof ridge. When eave vents are installed, baffling of the vent openings shall be provided so as to deflect the incoming air above the surface of the insulation. Baffles shall be, rigid material, resistant to wind driven moisture. Requirements for baffles for ceiling insulation shall meet the International Building Code section 1203.2 for minimum ventilation requirements. When feasible, the baffles shall be installed from the top of the outside of the exterior wall, extending inward, to a point 6 inches vertically above the height of noncompressed insulation, and 12 inches vertically above loose fill insulation.

502.1.4.6 Wall Insulation: Insulation installed in exterior walls shall comply with the provisions of this section. All wall insulation shall fill the entire framed cavity. Exterior wall cavities isolated during framing shall be fully insulated to the levels of the surrounding walls. All faced insulation shall be face stapled to avoid compression.

EXCEPTION: Framed cavity can be empty or partially filled provided:

1. The wall assembly calculations are performed along with a completed performance calculation for the whole building; and
2. Insulation installed in partially filled cavities is not included in the performance calculation.

502.1.4.7 Floor Insulation: Floor insulation shall be installed in a permanent manner in substantial contact with the surface being insulated. Insulation supports shall be installed so spacing is no more than 24 inches on center. Foundation vents shall be placed so that the top of the vent is below the lower surface of the floor insulation.

EXCEPTION: Insulation may be omitted from floor areas over heated basements, heated garages or underfloor areas used as HVAC supply plenums. When foundation walls are insulated, the insulation shall be attached in a permanent manner. The insulation shall not block the airflow through foundation vents when installed. When foundation vents are not placed so that the top of the vent is below the lower surface of the floor insulation, a permanently attached baffle shall be installed at an angle of 30° from horizontal, to divert air flow below the lower surface of the floor insulation.

502.1.4.8 Slab-On-Grade: Slab-on-grade insulation, installed inside the foundation wall, shall extend downward from the top of the slab for a minimum distance of 24 inches or downward and then horizontally beneath the slab for a minimum combined distance of 24 inches. Insulation installed outside the foundation shall extend downward to a minimum of 24 inches or to the frostline. Above grade insulation shall be protected.

EXCEPTION: For monolithic slabs, the insulation shall extend downward from the top of the slab to the bottom of the footing.

502.1.4.9 Radiant Slabs: The entire area of a radiant slab shall be thermally isolated from the soil, with a minimum of R-10 insulation. The insulation shall be an approved product for its intended use. If a soil gas control system is present below the radiant slab, which results in increased convective flow below the radiant slab, the radiant slab shall be thermally isolated from the sub-slab gravel layer.

502.1.4.10 Below Grade Walls: Below grade exterior wall insulation used on the exterior (cold) side of the wall shall extend from the top of the below grade wall to the top of the footing and shall be approved for below grade use. Above grade insulation shall be protected.

Insulation used on the interior (warm) side of the wall shall extend from the top of the below grade wall to the below grade floor level.

502.1.5 Glazing and Door U-factors: Glazing and door U-factors shall be determined in accordance with sections 502.1.5.1 and 502.1.5.2. All products shall be labeled with the NFRC certified or default U-factor. The labeled U-factor shall be used in all calculations to determine compliance with this Code. Sealed insulating glass shall conform to, or be in test for, ASTM E-774-81 class A.

EXCEPTIONS: 1. For glazed wall systems, assemblies with all of the following features are deemed to satisfy the vertical glazing U-factor requirement in Table 6-1 or 6-2 options with vertical glazing U-0.40 and greater:

a. Double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with $e = 0.10$ maximum, with 90% minimum argon gas fill, and a non-aluminum spacer (as defined in footnote 1 to Table 10-6B), and

b. Frame that is thermal break aluminum (as defined in footnote 9 to Table 10-6B), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 vertical glazing U-factor requirement using the exception to Section 502.1.5 in the Washington State Energy Code."

2. For overhead glazing, assemblies with all of the following features are deemed to satisfy the overhead glazing U-factor requirement in Table 6-1 or 6-2 options **except** the unlimited glazing area options (Options IV and V in Table 6-1 and Options V, VI and VII in Table 6-2):

a. Either, double glazing with a minimum 1/2 inch gap width, having a low-emissivity coating with $e = 0.20$ maximum, with 90% minimum argon gas fill, or, triple glazed plastic domes, and

b. Frame that is thermal break aluminum (as defined in footnote 9 to Table 10-6B), wood, aluminum clad wood, vinyl, aluminum clad vinyl, or reinforced vinyl.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 overhead glazing U-factor requirement using the exception to Section 502.1.5 in the Washington State Energy Code."

3. For solariums with a floor area which does not exceed 300 square feet, assemblies which comply with the features listed in exception 2 are deemed to satisfy the vertical glazing and overhead glazing U-factor requirement in Table 6-1 or 6-2 options with vertical glazing U-0.40 and greater.

The only labeling requirement for products using this exception shall be a description of the product and a label stating: "This product is deemed to satisfy the Table 6-1 or 6-2 vertical glazing and overhead glazing U-factor requirements using the exception to Section 502.1.5 in the Washington State Energy Code."

502.1.5.1 Standard Procedure for Determination of Glazing U-factors: U-factors for glazing shall be determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program (PCP), as authorized by an independent certification and inspection agency licensed by the NFRC. Compliance shall be based on the Residential Model Size. Product samples used for U-factor determinations shall be production line units or representative of units as purchased by the consumer or contractor. Products that are listed in the NFRC Certified Products Directory or certified to the NFRC standard shall not use default values.

EXCEPTIONS:

1. Glazing products without NFRC ratings may be assigned default U-factors from Table 10-6A for vertical glazing and from Table 10-6E for overhead glazing.
2. Units without NFRC ratings produced by a small business may be assigned default U-factors from Table 10-6A for garden windows, from Table 10-6B for other vertical glazing, and from Table 10-6E for overhead glazing.

502.1.5.2 Standard Procedure for Determination of Door U-factors: All doors, including fire doors, shall be assigned default U-factors from Table 10-6C.

EXCEPTIONS:

1. U-factors determined, certified and labeled in accordance with the National Fenestration Rating Council (NFRC) Product Certification Program (PCP), as authorized by an independent certification and inspection agency licensed by the NFRC.
2. The default values for the opaque portions of doors shall be those listed in Table 10-6C, provided that the U-factor listed for a door with a thermal break shall only be allowed if both the door and the frame have a thermal break.
3. One unlabeled or untested exterior swinging door with the maximum area of 24 square feet may be installed for ornamental, security or architectural purposes. Products using this exception shall not be included in the U-factor calculation requirements, however glazing area shall be included in glazing area calculations.

502.1.6 Moisture Control:

502.1.6.1 Vapor Retarders: Vapor retarders shall be installed on the warm side (in winter) of insulation as specified in the following cases.

EXCEPTION:

Vapor retarder installed with not more than 1/3 of the nominal R-value between it and the conditioned space.

502.1.6.2 Floors: Floors separating conditioned space from unconditioned space shall have a vapor retarder installed. The vapor retarder shall have a one perm dry cup rating or less (i.e., four mil [0.004 inch thick] polyethylene or kraft faced material).

502.1.6.3 Roof/Ceilings: Roof/ceiling assemblies where the ventilation space above the insulation is less than an average of 12 inches shall be provided with a vapor retarder. Faced batt insulation where used as a vapor retarder shall be face stapled. Single rafter joist vaulted ceiling cavities shall be of sufficient depth to allow a minimum one inch vented air space above the insulation.

502.1.6.4: Vapor retarders shall not be required in roof/ceiling assemblies where the ventilation space above the insulation averages 12 inches or greater.

502.1.6.5: Vapor retarders shall not be required where all of the insulation is installed between the roof membrane and the structural roof deck.

502.1.6.6 Walls: Walls separating conditioned space from unconditioned space shall have a vapor retarder installed. Faced batt insulation shall be face stapled.

EXCEPTION:

For climate zone 1, wood framed walls with a minimum of nominal R-5 continuous insulated sheathing installed outside of the framing and structural sheathing. For climate zone 2, wood framed walls with a minimum of nominal R-7.5 continuous insulated sheathing installed outside of the framing and structural sheathing. The interior cavity insulation for this exception shall be a maximum of nominal R-21.

502.1.6.7 Ground Cover: A ground cover of six mil (0.006 inch thick) black polyethylene or approved equal shall be laid over the ground within crawl spaces. The ground cover shall be overlapped 12 inches minimum at the joints and shall extend to the foundation wall.

EXCEPTION:

The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of 3-1/2 inches.

502.2 Thermal Criteria for Group R Occupancy:

502.2.1 UA Calculations: The proposed UA as calculated using Equations 2 and 3 shall not exceed the target UA as calculated using Equation 1. For the purpose of determining equivalent thermal performance, the glazing area for the target UA shall be calculated using values in Table 5-1. The opaque door area shall be the same in the target UA and the proposed UA.

EXCEPTION:

Log and solid timber walls that have a minimum average thickness of 3.5" and with space heat type other than electric resistance, are exempt from wall target UA and proposed UA calculations.

502.2.2 Space Heat Type: The following two categories comprise all space heating types:

1. **Electric Resistance:** Space heating systems which include baseboard units, radiant units and forced air units as either the primary or secondary heating system.

EXCEPTION:

Electric resistance systems for which the total electric heat capacity in each individual dwelling unit does not exceed the greater of: 1) One thousand watts (1000 w) per dwelling unit, or; 2) One watt per square foot (1 w/ft²) of the gross floor area.

2. Other: All gas, wood, oil and propane space heating systems, unless electric resistance is used as a secondary heating system, and all heat pump space heating systems. (See EXCEPTIONS, Electric Resistance, section 502.2.2 above.)

502.3 Reserved.

502.4 Air Leakage:

502.4.1 General: The requirements of this section shall apply to all buildings and structures, or portions thereof, and only to those locations separating outdoor ambient conditions from interior spaces that are heated or mechanically cooled.

502.4.2 Doors and Windows, General: Exterior doors and windows shall be designed to limit air leakage into or from the building envelope. Site-constructed doors and windows shall be sealed in accordance with Section 502.4.3.

502.4.3 Seals and Weatherstripping:

a. Exterior joints around windows and door frames, openings between walls and foundation, between walls and roof and wall panels; openings at penetrations of utility services through walls, floors and roofs; and all other openings in the building envelope for all occupancies and all other openings in between units in R-1 and R-2 Occupancy shall be sealed, caulked, gasketed or weatherstripped to limit air leakage. Other exterior joints and seams shall be similarly treated, or taped, or covered with moisture vapor permeable housewrap.

b. All exterior doors or doors serving as access to an enclosed unheated area shall be weatherstripped to limit leakage around their perimeter when in a closed position.

c. Site built windows are exempt from testing but shall be made tight fitting. Fixed lights shall have glass retained by stops with sealant or caulking all around. Operating sash shall have weatherstripping working against overlapping trim and a closer/latch which will hold the sash closed. The window frame to framing crack shall be made tight with caulking, overlapping membrane or other approved technique.

d. Openings that are required to be fire resistive are exempt from this section.

502.4.4 Recessed Lighting Fixtures: When installed in the building envelope, recessed lighting fixtures shall be Type IC rated and certified under ASTM E283 to have no more than 2.0 cfm air movement from the conditioned space to the ceiling cavity. The lighting fixture shall be tested at 75 Pascals or 1.57 lbs/ft² pressure difference and have a label attached, showing compliance with this test method. Recessed lighting fixtures shall be installed with a gasket or caulk between the fixture and ceiling to prevent air leakage.

[Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 09-06-024, § 51-11-0502, filed 2/23/09, effective 7/1/10. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0502, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 05-01-013, § 51-11-0502, filed 12/2/04, effective 7/1/05. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0502, filed 12/17/03, effective 7/1/04. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0502, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0502, filed

1/5/01, effective 7/1/01; 98-03-003, § 51-11-0502, filed 1/8/98, effective 7/1/98. Statutory Authority: Chapters 19.27 and 19.27A RCW and 1994 c 226. 95-01-126, § 51-11-0502, filed 12/21/94, effective 6/30/95. Statutory Authority: Chapters 19.27, 19.27A and 34.05 RCW. 94-05-059, § 51-11-0502, filed 2/10/94, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0502, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0502, filed 12/19/90, effective 7/1/91.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 51-11-0503 Building mechanical systems.

503.1 General: This section covers the determination of design requirements, system and component performance, control requirements, insulating systems and duct sealing. For all other duct construction requirements, refer to the State Mechanical Code (chapter 51-42 WAC).

503.2 Calculations of Heating and Cooling Loads, and System Sizing Limits: The design parameters specified in Chapter 3 shall apply for all computations.

503.2.1 Calculation Procedures: Heating and cooling design loads for the purpose of sizing HVAC systems are required and shall be calculated in accordance with accepted engineering practice, including infiltration and ventilation.

503.2.2 Space Heating and Space Cooling System Sizing Limits: Building mechanical systems for all buildings which provide space heating and/or space cooling shall be sized no greater than one hundred fifty percent (150%) of the heating and cooling design loads as calculated above.

EXCEPTIONS: The following limited exemptions from the sizing limit shall be allowed; however, in all cases heating and/or cooling design load calculations shall be submitted.

1. For equipment which provides both heating and cooling in one package unit, including heat pumps with electric heating and cooling and gas-pack units with gas heating and electric cooling, compliance need only be demonstrated for either the space heating or space cooling system size.

2. Natural gas- or oil-fired space heating equipment whose total rated space heating output in any one dwelling unit is

a. 40,000 Btu/h or less is exempt from the sizing limit,

b. Larger than 40,000 Btu/h may exceed the one hundred fifty (150%) percent sizing limit but not exceed 250 percent provided that the installed equipment has an annual fuel utilization efficiency (AFUE) of ninety (90%) percent or greater.

3. Stand-by equipment may be installed if controls and other devices are provided which allow redundant equipment to operate only when the primary equipment is not operating.

503.3 Simultaneous Heating and Cooling: Systems and equipment that provide simultaneous heating and cooling shall comply with the requirements in, as appropriate, Section 1422 or Section 1435.

503.4 HVAC Equipment Performance Requirements: All heating equipment shall meet the requirements of the National Appliance Energy Conservation Act (NAECA) and be so labeled. Equipment shall also comply with Section 1411.

503.5 Reserved.

503.6 Balancing: The HVAC system design shall provide a means for balancing air and water systems. Balancing the system shall include, but not be limited to, dampers, temperature and pressure test connections and balancing valves.

503.7 Cooling with Outdoor Air (Economizer Cycle): Systems and equipment that provide mechanical cooling shall comply with Section 1413 and, as appropriate, Section 1423 or 1433.

503.8 Controls:

503.8.1 Temperature Control: Each system shall be provided with at least one adjustable thermostat for the regulation of temperature. Each thermostat shall be capable of being set by adjustment or selection of sensors as follows:

503.8.1.1: When used to control heating only: Fifty-five degrees to seventy-five degrees F.

503.8.1.2: When used to control cooling only: Seventy degrees to eighty-five degrees F.

503.8.1.3: When used to control both heating and cooling, it shall be capable of being set from fifty-five degrees to eighty-five degrees F and shall be capable of operating the system heating and cooling in sequence. The thermostat and/or control system shall have an adjustable deadband of not less than ten degrees F.

503.8.2 Humidity Control: If a system is equipped with a means for adding moisture to maintain specific selected relative humidities in space or zones, a humidistat shall be provided. Humidistats shall be capable of being set to prevent new energy from being used to produce space-relative humidity above thirty percent.

EXCEPTION: Special uses requiring different relative humidities may be permitted when approved by the building official.

503.8.3 Zoning for Temperature Control:

503.8.3.1 One- and Two-Family Dwellings: At least one thermostat for regulation of space temperature shall be provided for each separate system. In addition, a readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each zone or floor.

503.8.3.2 Multifamily Dwellings: For multifamily dwellings, each individual dwelling unit shall have at least one thermostat for regulation of space temperature. A readily accessible manual or automatic means shall be provided to partially restrict or shut off the heating and/or cooling input to each room. Spaces other than living units shall meet the requirements of 503.8.3.3.

503.8.3.3 Control Setback and Shutoff:

One- and Two-Family and Individual Multifamily dwelling units—The thermostat required in section 503.8.3.1 or section 503.8.3.2, or an alternate means such as a switch or clock, shall provide a readily accessible, manual or automatic means for reducing the energy required for heating and cooling during the periods of nonuse or reduced need, such as, but not limited to unoccupied periods and sleeping hours. Lowering thermostat set points to reduce energy consumption of

heating systems shall not cause energy to be expended to reach the reduced setting.

503.8.3.4 Systems Serving Multiple Dwelling Units, Guest Rooms, and Common Areas: Systems that serve more than two dwelling units, guest rooms, and common areas shall comply with the control requirements in Sections 1412 and 1432, with the exceptions of Sections 1412.4.2 and 1432.1.

503.8.3.5 Heat Pump Controls: Programmable thermostats are required for all heat pump systems. The cut-on temperature for the compression heating shall be higher than the cut-on temperature for the supplementary heat, and the cut-off temperature for the compression heating shall be higher than the cut-off temperature for the supplementary heat. Heat pump thermostats will be capable of providing at least two programmable setback periods per day. The automatic setback thermostat shall have the capability of limiting the use of supplemental heat during the warm-up period.

503.9 Air Handling Duct System Insulation: Ducts, plenums and enclosures installed in or on buildings shall be thermally insulated per Table 5-11.

EXCEPTIONS: Duct insulation (except where required to prevent condensation) is not required in any of the following cases:

1. When the heat gain or loss of the ducts, without insulation, will not increase the energy requirements of the building.
2. Within the HVAC equipment.
3. Exhaust air ducts.
4. Supply or return air ducts installed in unvented crawl spaces with insulated walls, basements, or cellars in one- and two-family dwellings.

503.10 Ducts.

503.10.1 Leakage Testing: High-pressure and medium-pressure ducts shall be leak tested in accordance with the 1985 Edition of the SMACNA HVAC Air Duct Leakage Test Manual with the rate of air leakage not to exceed the maximum rate specified in that standard.

503.10.2 Sealing: All ducts, air handlers, filter boxes, and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.3 of the International Residential Code or Section 603.9 of the International Mechanical Code. Duct tightness testing shall be conducted to verify that the ducts are sealed. A signed affidavit documenting the test results shall be provided to the jurisdiction having authority by the testing agent. When required by the building official, the test shall be conducted in the presence of department staff. Duct tightness shall be verified by either of the following:

1. Postconstruction test: Leakage to outdoors shall be less than or equal to 6 cfm per 100 ft² of conditioned floor area or a total leakage less than or equal to 8 cfm per 100 ft² of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm per 100 ft² of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed-in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm per 100 ft² of conditioned floor area.

EXCEPTIONS:

1. Duct tightness test is not required if the air handler and all ducts are located within conditioned space.
2. Duct tightness test is not required if the furnace is a nondirect vent type combustion appliance installed in an unconditioned space. A maximum of six feet of connected ductwork in the unconditioned space is allowed. All additional supply and return ducts shall be within the conditioned space. Ducts outside the conditioned space shall be sealed with a mastic type duct sealant and insulated on the exterior with R-8 insulation for above grade ducts and R-5 water resistant insulation when within a slab or earth.

503.10.3 Dampers: Requirements for Automatic or manual dampers are found in the Washington State Ventilation and Indoor Air Quality Code.

503.11 Pipe Insulation: All piping shall be thermally insulated in accordance with Table 5-12.

EXCEPTION: Piping installed within unitary HVAC equipment.

Cold water pipes outside the conditioned space shall be insulated in accordance with the Washington State Plumbing Code (chapter 51-56 WAC).

[Statutory Authority: RCW 19.27A.025, 19.27A.045 and chapters 19.27, 19.27A, and 34.05 RCW. 09-06-024, § 51-11-0503, filed 2/23/09, effective 7/1/10. Statutory Authority: RCW 19.27A.022, 19.27A.025, 19.27A.045, and chapters 19.27 and 34.05 RCW. 07-01-089, § 51-11-0503, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27A.020, 19.27A.045. 04-01-106, § 51-11-0503, filed 12/17/03, effective 7/1/04; 02-24-076, § 51-11-0503, filed 12/4/02, effective 5/1/03. Statutory Authority: RCW 19.27A.025, 19.27A.045. 02-01-112, § 51-11-0503, filed 12/18/01, effective 7/1/02; 01-03-010, § 51-11-0503, filed 1/5/01, effective 7/1/01. Statutory Authority: RCW 19.27A.020, 19.27A.045, and 19.27.020. 98-24-075, § 51-11-0503, filed 12/1/98, effective 7/1/99. Statutory Authority: RCW 19.27A.025 and 19.27A.045. 98-03-003, § 51-11-0503, filed 1/8/98, effective 7/1/98. Statutory Authority: RCW 19.27A.025. 93-21-052, § 51-11-0503, filed 10/18/93, effective 4/1/94. Statutory Authority: Chapter 19.27A RCW. 92-01-140, § 51-11-0503, filed 12/19/91, effective 7/1/92. Statutory Authority: RCW 19.27A.020 and 1990 c 2. 91-01-112, § 51-11-0503, filed 12/19/90, effective 7/1/91.]

Chapter 51-51 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE INTERNATIONAL RESIDENTIAL CODE

WAC

51-51-0202	Section R202—Definitions.
51-51-0302	Section R302—Location on lot.
51-51-0325	Section R325—Adult family homes.

WAC 51-51-0202 Section R202—Definitions.

ADULT FAMILY HOME means a dwelling in which a person or persons provide personal care, special care, room and board to more than one but not more than six adults who are not related by blood or marriage to the person or persons providing the services.

BALCONY, EXTERIOR. Definition is not adopted.

[2010 WAC Supp—page 6]

CHILD DAY CARE, shall, for the purposes of these regulations, mean the care of children during any period of a 24 hour day.

CHILD DAY CARE HOME, FAMILY is a child day care facility, licensed by the state, located in the dwelling of the person or persons under whose direct care and supervision the child is placed, for the care of twelve or fewer children, including children who reside at the home.

DECK. Definition is not adopted.

DWELLING UNIT. A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation. Dwelling units may also include the following uses:

1. Adult family homes, foster family care homes and family day care homes licensed by the Washington state department of social and health services.

2. Offices, mercantile, food preparation for off-site consumption, personal care salons or similar uses which are conducted primarily by the occupants of the dwelling unit and are secondary to the use of the unit for dwelling purposes, and which do not exceed 500 square feet (46.4m²).

FIRE SEPARATION DISTANCE. The distance measured from the foundation wall or face of the wall framing, whichever is closer, to one of the following:

1. To the closest interior lot line; or
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the lot.

The distance shall be measured at a right angle from the wall.

SMALL BUSINESS. Any business entity (including a sole proprietorship, corporation, partnership or other legal entity) which is owned and operated independently from all other businesses, which has the purpose of making a profit, and which has fifty or fewer employees, or which has a million dollars or less per year in gross sales, of window products.

UNUSUALLY TIGHT CONSTRUCTION. Construction meeting the following requirements:

1. Walls exposed to the outside atmosphere having a continuous water vapor retarder with a rating of 1 perm (57 ng/s·m²·Pa) or less with openings gasketed or sealed;

2. Openable windows and doors meeting the air leakage requirements of the *International Energy Conservation Code*, Section 502.1.4; and

3. Caulking or sealants are applied to areas such as joints around window and door frames, between sole plates and floors, between wall-ceiling joints, between wall panels, at penetrations for plumbing, electrical and gas lines, and at other openings; or

4. Buildings built in compliance with the 1986 or later editions of the Washington State Energy Code chapter 51-11 WAC, Northwest Energy Code, or Super Good Cents weatherization standards or equivalent.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0202, filed 1/27/09, effective 7/1/09; 08-01-102, § 51-51-0202, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0202, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW

19.27.031 and 19.27.074. 04-01-109, § 51-51-0202, filed 12/17/03, effective 7/1/04.]

WAC 51-51-0302 Section R302—Location on lot.

R302.1 Exterior walls. Exterior walls with a fire separation distance of 3 feet (914 mm) or less shall have not less than a one-hour fire-resistive rating with exposure from both sides. Projections shall not extend to a point closer than 2 feet (610 mm) from the line used to determine the fire separation distance.

EXCEPTION: Detached garages accessory to a dwelling located within 2 feet of a lot line may have roof eave projections not exceeding 4 inches.

Projections extending into the fire separation distance shall have not less than one-hour fire-resistive construction on the underside. The above provisions shall not apply to walls which are perpendicular to the line used to determine the fire separation distance.

EXCEPTIONS:

1. Tool and storage sheds, playhouses and similar structures exempted from permits by Section R105.2 are not required to provide wall protection based on location on the lot. Projections beyond the exterior wall shall not extend over the lot line.
2. Eave projections into the fire separation distance do not require one-hour fire-resistive construction where no openings are provided in the eaves, including openings for ventilation.

R302.2 Openings. Openings shall not be permitted in the exterior wall of a dwelling or accessory building with a fire separation distance of 3 feet (914 mm) or less. Openings, including openings for ventilation, shall be limited to 25% of the exterior wall area with a fire separation distance between 3 feet (914 mm) to less than 5 feet (1524 mm). This distance shall be measured perpendicular to the line used to determine the fire separation distance.

EXCEPTIONS:

1. Openings shall be permitted in walls that are perpendicular to the line used to determine the fire separation distance.
2. Foundation vents installed in compliance with this code are permitted.

R302.3 Penetrations. Penetrations located in the exterior wall of a dwelling with a fire separation distance of 3 feet (914 mm) or less shall be protected in accordance with Section R317.3.

EXCEPTION: Penetrations shall be permitted in walls that are perpendicular to the line used to determine the fire separation distance.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0302, filed 1/27/09, effective 7/1/09; 08-01-102, § 51-51-0302, filed 12/18/07, effective 4/1/08.]

WAC 51-51-0325 Section R325—Adult family homes.

SECTION R325 ADULT FAMILY HOMES

R325.1 General. This section shall apply to all newly constructed adult family homes and all existing single family homes being converted to adult family homes. This section shall not apply to those adult family homes licensed by the state of Washington department of social and health services prior to July 1, 2001.

R325.2 Submittal Standards. In addition to those requirements in Section 106.1, the submittal shall identify the project as a Group R-3 Adult Family Home Occupancy. A floor plan shall be submitted identifying the means of egress and the components in the means of egress such as stairs, ramps, platform lifts and elevators. The plans shall indicate the rooms used for clients and the sleeping room classification of each room.

R325.3 Sleeping Room Classification. Each sleeping room in an adult family home shall be classified as:

1. Type S - where the means of egress contains stairs, elevators or platform lifts.
2. Type NS1 - where one means of egress is at grade level or a ramp constructed in accordance with R325.9 is provided.
3. Type NS2 - where two means of egress are at grade level or ramps constructed in accordance with R325.9 are provided.

R325.4 Types of Locking Devices. All bedroom and bathroom doors shall be openable from the outside when locked.

Every closet shall be readily openable from the inside.

Operable parts of door handles, pulls, latches, locks and other devices installed in adult family homes shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate operable parts shall be 5.0 pounds (22.2 N) maximum. Exit doors shall have no additional locking devices.

R325.5 Smoke Alarm Requirements. All adult family homes shall be equipped with smoke alarms installed as required in Section R313. Alarms shall be installed in such a manner so that the fire warning may be audible in all parts of the dwelling upon activation of a single device.

R325.6 Escape Windows and Doors. Every sleeping room shall be provided with emergency escape and rescue windows as required by Section R310. No alternatives to the sill height such as steps, raised platforms or other devices placed by the openings will be approved as meeting this requirement.

R325.7 Fire Apparatus Access Roads and Water Supply for Fire Protection. Adult family homes shall be served by fire apparatus access roads and water supplies meeting the requirements of the local jurisdiction.

R325.8 Grab Bars. Grab bars shall be installed for all water closets and bathtubs and showers. The grab bars shall comply with ICC/ANSI A117.1 Sections 604.5 and 607.4 and 608.3.

EXCEPTION: Grab bars are not required for water closets and bathtubs and showers used exclusively by staff of the adult family home.

R325.9 Ramps. All interior and exterior ramps, when provided, shall be constructed in accordance with Section R311.6 with a maximum slope of 1 vertical to 12 horizontal. The exception to R311.6.1 is not allowed for adult family homes. Handrails shall be installed in accordance with R325.9.1.

R325.9.1 Handrails for Ramps. Handrails shall be installed on both sides of ramps between the slope of 1 vertical to 12

horizontal and 1 vertical and 20 horizontal in accordance with R311.6.3.1 through R311.6.3.3.

R325.10 Stair Treads and Risers. Stair treads and risers shall be constructed in accordance with R311.5.3.2. Handrails shall be installed in accordance with R325.10.1.

R325.10.1 Handrails for Treads and Risers. Handrails shall be installed on both sides of treads and risers numbering from one riser to multiple risers. Handrails shall be installed in accordance with R311.5.6.1 through R311.5.6.3.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-023, § 51-51-0325, filed 1/27/09, effective 7/1/10. Statutory Authority: RCW 19.27.074, 19.27.020, and chapters 19.27 and 34.05 RCW. 07-01-090, § 51-51-0325, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-109, § 51-51-0325, filed 12/17/03, effective 7/1/04.]

Chapter 51-54 WAC

STATE BUILDING CODE ADOPTION AND AMENDMENT OF THE 2006 EDITION OF THE INTERNATIONAL FIRE CODE

(Formerly chapters 51-44 and 51-45 WAC)

WAC

51-54-0400	Chapter 4—Emergency planning and preparedness.
51-54-0900	Chapter 9—Fire protection systems.
51-54-1000	Chapter 10—Means of egress.

WAC 51-54-0400 Chapter 4—Emergency planning and preparedness.

401.2 Approval. Where required by the fire code official, fire safety plans, emergency procedures, and employee training programs shall be approved.

SECTION 402 DEFINITIONS

EMERGENCY DRILL. An exercise performed to train staff and occupants and to evaluate their efficiency and effectiveness in carrying out emergency procedures.

LOCKDOWN. An action used to position occupants behind secured openings and isolated from threats.

Full lockdown. Occupants remain out of sight and as quiet as possible, with only limited authorized entry, exit, or movement within the building. Occupants in corridors, common areas, or unsecured areas move quickly to the nearest secured area.

Modified lockdown. Occupants of a facility are isolated from potential outside threats by remaining within a building with exterior doors and other exits secured, and that entry and exit from the building is limited to that which is authorized. During a modified lockdown, interior movement and other activities within the building may be allowed or restricted in accordance to the lockdown plan.

SHELTER-IN-PLACE. An emergency response used to minimize exposure of facility occupants to chemical or environmental hazards by taking refuge in predetermined interior rooms or areas where actions are taken to isolate the interior environment from the exterior hazard.

SECTION 404 EMERGENCY PLANS

404.1 General. Fire safety, evacuation, shelter-in-place, and lockdown plans shall comply with the requirements of this section.

404.2 Fire safety and evacuation plans. Fire safety and evacuation plans shall comply with the requirements of Sections 404.2.1 through 404.2.4.

404.2.1 Where required. A fire safety and evacuation plan shall be prepared and maintained in accordance with this chapter for the following occupancies and buildings when required by the fire code official.

1. Group A having an occupant load of 100 or more.
2. Group B buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
3. Group E.
4. Group H.
5. Group I.
6. Group R-1.
7. Group R-2 college and university buildings. Boarding homes, group homes, and residential treatment facilities licensed by the state of Washington.
8. High-rise buildings.
9. Group M buildings having an occupant load of 500 or more persons or more than 100 persons above or below the lowest level of exit discharge.
10. Covered malls exceeding 50,000 sf in aggregate floor area.
11. Underground buildings.
12. Buildings with an atrium and having an occupancy in Group A, E, or M.

404.2.2 Contents. Fire safety and evacuation plan contents shall be in accordance with Sections 404.2.2.1 and 404.2.2.2.

404.2.2.1 Fire evacuation plans. Fire evacuation plans shall include the following:

1. Emergency egress or escape routes and whether evacuation of the building is to be complete or, where approved, by selected floors or areas only.
2. Procedures for employees who must remain to operate critical equipment before evacuating.
3. Procedures for accounting for employees and occupants after evacuation has been completed.
4. Identification and assignment of personnel responsible for rescue or emergency medical aid.
5. The preferred and any alternative means of notifying occupants of a fire or emergency.
6. The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
7. Identification and assignment of personnel who can be contacted for further information or explanation of duties under the plan.
8. A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages, where provided.

404.2.2.2 Fire safety plans. Fire safety plans shall include the following:

1. The procedure for reporting a fire or other emergency.

2. The life safety strategy and procedures for notifying, relocating, or evacuating occupants.
3. Site plans indicating the following:
 - 3.1 The occupancy assembly point.
 - 3.2 The locations of fire hydrants.
 - 3.3 The normal routes of fire department vehicle access.
4. Floor plans identifying the locations of the following:
 - 4.1 Exits.
 - 4.2 Primary evacuation routes.
 - 4.3 Secondary evacuation routes.
 - 4.4 Accessible egress routes.
 - 4.5 Areas of refuge.
 - 4.6 Manual fire alarm boxes.
 - 4.7 Portable fire extinguishers.
 - 4.8 Occupant-use hose stations.
 - 4.9 Fire alarm annunciators and controls.
5. A list of major fire hazards associated with the normal use and occupancy of the premises, including maintenance and housekeeping procedures.
6. Identification and assignment of personnel responsible for maintenance of systems and equipment installed to prevent or control fires.
7. Identification and assignment of personnel responsible for maintenance, housekeeping and controlling fuel hazard sources.

404.2.3 Maintenance. Fire safety and evacuation plans shall be reviewed by the owner or occupant annually or more often, as necessitated by changes in staff assignments, occupancy, or the physical arrangement of the building.

404.2.4 Availability. Fire safety and evacuation plans shall be available in the workplace for reference and review by employees, and copies shall be furnished to the fire code official for review upon request.

404.3 Shelter-in-place and lockdown plans. Shelter-in-place and lockdown plans shall comply with the requirements of Sections 404.3.1 through 404.3.4.

404.3.1 Where required. A shelter-in-place and lockdown plan shall be prepared and maintained for all Group E occupancies.

EXCEPTION: Day cares not colocated on a Group E campus.

404.3.2 Contents. Shelter-in-place and lockdown plan contents shall be in accordance with Sections 404.3.2.1 and 404.3.2.2.

404.3.2.1 Shelter-in-place plans. Shelter-in-place plans shall include the following:

1. Identification of the procedures of initiating the shelter-in-place plan throughout the facility or campus.
2. Identification of prearranged alert and recall signals to notify all occupants.
3. Identification of procedures for reporting the facility is sheltering-in-place to the local emergency dispatch center.
4. A means of two-way communication between a central location and each secure area.
5. Identification of protective security measures.
6. Location of emergency supplies.
7. Accountability procedures for staff to report the presence or absence of occupants.

8. Identification of crisis response team members in accordance with the National Incident Management System.
9. Actions to be taken in the event of a fire or medical emergency while sheltering-in-place.

404.3.2.2 Lockdown plans. Lockdown plans shall include the following:

1. Identification of the procedures of initiating the lockdown plan throughout the facility or campus.
2. Identification of prearranged alert and recall signals to notify all occupants.
3. Identification of procedure for access to facility for emergency responders.
4. Identification of procedures for reporting the facility is in lockdown to the local emergency dispatch center.
5. A means of two-way communication between a central location and each secure area.
6. Identification of protective security measures.
7. Location of emergency supplies.
8. Accountability procedures for staff to report the presence or absence of occupants.
9. Identification of crisis response team members in accordance with the National Incident Management System.
10. Actions to be taken in the event of a fire or medical emergency while in lockdown.

404.3.3 Maintenance. Shelter-in-place and lockdown plans shall be reviewed by the owner or occupant annually or more often, as necessitated by changes in staff assignments, occupancy, or the physical arrangement of the building.

404.3.4 Availability. Shelter-in-place and lockdown plans shall be available in the workplace for reference and review by employees, and copies shall be furnished to the fire code official for review upon request.

Sections 404.4 and 404.5 are not adopted.

SECTION 405 EMERGENCY DRILLS

405.1 General. Emergency drills shall comply with the requirements of this section.

405.2 Emergency evacuation drills. Emergency evacuation drills complying with the provisions of this section shall be conducted at least annually in the occupancies listed in Section 404.2.1 or when required by the fire code official. Drills shall be designed in cooperation with the local authorities.

405.2.1 Frequency. Required emergency evacuation drills shall be held at the intervals specified in Table 405.2.1 or more frequently where necessary to familiarize all occupants with the drill procedure.

**TABLE 405.2.1
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION**

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group A	Quarterly	Employees
Group B ^c	Annually	Employees
Group E	Monthly ^{a,e}	All occupants
Group I	Quarterly on each shift	Employees ^b

**TABLE 405.2.1
FIRE AND EVACUATION DRILL
FREQUENCY AND PARTICIPATION**

GROUP OR OCCUPANCY	FREQUENCY	PARTICIPATION
Group R-1	Quarterly on each shift	Employees
Group R-2 ^f	Quarterly on each shift	Employees
Group R-2 ^d	Four annually	All occupants
High-rise buildings	Annually	Employees

- a. The frequency shall be allowed to be modified in accordance with Section 408.3.2.
- b. Fire and evacuation drills in residential care assisted living facilities shall include complete evacuation of the premises in accordance with Section 408.10.5. Where occupants receive habilitation or rehabilitation training, fire prevention and fire safety practices shall be included as part of the training program.
- c. Group B buildings having an occupant load of five hundred or more persons or more than one hundred persons above or below the lowest level of exit discharge.
- d. Applicable to Group R-2 college and university buildings in accordance with Section 408.3.
- e. Group E and day cares collocated on a Group E campus shall jointly perform at least six fire and evacuation drills per school year.
- f. Applicable to boarding homes, group homes, and residential treatment facilities licensed by the state of Washington.

405.2.2 Leadership. Responsibility for the planning and conduct of drills shall be assigned to competent persons designated to exercise leadership.

405.2.3 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of fire.

405.2.4 Recordkeeping. Records shall be maintained of required emergency evacuation drills and include the following information:

1. Identity of the person conducting the drill.
2. Date and time of the drill.
3. Notification method used.
4. Staff members on duty and participating.
5. Number of occupants evacuated.
6. Special conditions simulated.
7. Problems encountered and corrective action taken.
8. Weather conditions when occupants were evacuated.
9. Time required to accomplish complete evacuation.

405.2.5 Notification. Where required by the fire code official, prior notification of emergency evacuation drills shall be given to the fire code official.

405.2.6 Initiation. Where a fire alarm system is provided, emergency evacuation drills shall be initiated by activating the fire alarm system. The fire alarm monitoring company shall be notified prior to the activation of the fire alarm system for drill purposes and again at the conclusion of the transmission and restoration of the fire alarm system to normal mode.

EXCEPTION: Drills conducted between the hours of 9:00 p.m. and 6:00 a.m., in Group R-2 boarding homes, group homes and residential treatment facilities licensed by the state of Washington, are allowed to utilize a coded announcement.

405.2.7 Accountability. As building occupants arrive at the assembly point, efforts shall be made to determine if all occupants have been successfully evacuated or have been accounted for.

405.2.8 Recall and reentry. An electrically or mechanically operated signal used to recall occupants after an evacuation shall be separate and distinct from the signal used to initiate the evacuation. The recall signal initiation means shall be manually operated and under the control of the person in charge of the premises or the official in charge of the incident. No one shall reenter the premises until authorized to do so by the official in charge.

405.3 Shelter-in-place and lockdown drills. Shelter-in-place and lockdown drills complying with the provisions of this section shall be conducted in the occupancies listed in Section 404.3.1 or when required by the fire code official. Drills shall be designed in cooperation with local authorities.

405.3.1 Frequency. Shelter-in-place and lockdown drills required by this section shall each be held at least annually to familiarize all occupants with the emergency procedures. Group E and collocated day cares shall drill jointly.

405.3.2 Leadership. Responsibility for the planning and conduct of drills shall be assigned to competent persons designated to exercise leadership.

405.3.3 Time. Drills shall be held at unexpected times and under varying conditions to simulate the unusual conditions that occur in case of an emergency.

405.3.4 Recordkeeping. Records shall be maintained of required shelter-in-place and lockdown drills and include the following information:

1. Identity of the person conducting the drill.
2. Date and time of the drill.
3. Notification method used.
4. Staff members on duty and participating.
5. Number of occupants sheltered and unaccounted for.
6. Special conditions simulated.
7. Problems encountered and corrective actions taken.
8. Time required to accomplish complete sheltering.

405.3.5 Notification. Where required by the fire code official, prior notification of shelter-in-place and lockdown drills shall be given to appropriate emergency response agencies.

405.3.6 Signals. Alerting signals shall be separate and distinct from the fire alarm and other signals.

405.3.7 Accountability. Efforts shall be made to determine if all occupants have been successfully sheltered and accounted for.

SECTION 406 EMPLOYEE TRAINING AND RESPONSE PROCEDURES

406.1 General. Employees in the occupancies listed in Sections 404.2.1 and 404.3.1 shall be trained in the procedures described in their emergency plans. Training shall be based on these plans and as described in Sections 404.2.2 and 404.3.2.

406.3 Employee training program. Employees shall be trained in fire prevention, evacuation, fire safety, shelter-in-

place, and lockdown in accordance with Sections 406.3.1 through 406.3.4.

406.3.4 Shelter-in-place and lockdown training. Employees shall be familiarized with the alert and recall signals, their assigned duties in the event of an alarm or emergency, communication system, location of emergency supplies, and the use of the incident notification and alert system.

SECTION 408 USE AND OCCUPANCY-RELATED REQUIREMENTS

408.2.1 Seating plan. The fire safety and evacuation plans for assembly occupancies shall include the information required by Section 404.2.2 and a detailed seating plan, occupant load, and occupant load limit. Deviations from the approved plans shall be allowed provided the occupant load limit for the occupancy is not exceeded and the aisles and exit accessways remain unobstructed.

408.3.2 Emergency evacuation drill deferral. In severe climates, the fire code official shall have the authority to modify the emergency evacuation drill frequency specified in Section 405.2.1.

408.5.4 Drill frequency. Emergency evacuation drills shall be conducted at least six times per year, two times per year on each shift. Twelve drills shall be conducted in the first year of operation. Drills are not required to comply with the time requirements of Section 405.2.3.

408.6 Group I-2 occupancies. Group I-2 occupancies shall comply with the requirements of Sections 408.6.1 and 408.6.2 and Sections 401 through 406. Drills are not required to comply with the time requirements of Section 405.2.3.

Section 408.10 is not adopted.

408.11.1 Lease plan. A lease plan shall be prepared for each covered mall building. The plan shall include the following information in addition to that required by Section 404.2.2.2:

1. Each occupancy, including identification of tenant.
2. Exits from each tenant space.
3. Fire protection features, including the following:
 - 3.1 Fire department connections.
 - 3.2 Fire command center.
 - 3.3 Smoke management system controls.
 - 3.4 Elevators and elevator controls.
 - 3.5 Hose valves outlets.
 - 3.6 Sprinkler and standpipe control valves.
 - 3.7 Automatic fire-extinguishing system areas.
 - 3.8 Automatic fire detector zones.
 - 3.9 Fire barriers.

408.11.1.1 Submittal. The lease plan shall be submitted to the fire code official, and shall be maintained on-site for immediate reference by responding fire service personnel.

408.11.1.2 Revisions. The lease plan shall be reviewed and revised annually or as often as necessary to keep them current. Modifications or changes in occupancies shall not be made without prior approval of the fire code official and building official.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-0400, filed 1/28/09, effective 7/1/09. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05

RCW. 07-01-093, § 51-54-0400, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-01-016, § 51-54-0400, filed 12/2/04, effective 7/1/05.]

WAC 51-54-0900 Chapter 9—Fire protection systems.

902.1 Definitions.

PORTABLE SCHOOL CLASSROOM. A structure, transportable in one or more sections, which requires a chassis to be transported, and is designed to be used as an educational space with or without a permanent foundation. The structure shall be trailerable and capable of being demounted and relocated to other locations as needs arise.

903.2.2 Group E. An automatic sprinkler system shall be provided for Group E Occupancies.

- EXCEPTIONS:
1. Portable school classrooms, provided aggregate area of any cluster or portion of a cluster of portable school classrooms does not exceed 5,000 square feet (1465 m²); and clusters of portable school classrooms shall be separated as required in Chapter 5 of the building code.
 2. Group E Occupancies with an occupant load of 50 or less.

903.2.7 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area.

- EXCEPTION:
- Group R-1 if all of the following conditions apply:
1. The Group R fire area is no more than 500 square feet and is used for recreational use only.
 2. The Group R fire area is on only one story.
 3. The Group R fire area does not include a basement.
 4. The Group R fire area is no closer than 30 feet from another structure.
 5. Cooking is not allowed within the Group R fire area.
 6. The Group R fire area has an occupant load of no more than 8.
 7. A hand held (portable) fire extinguisher is in every Group R fire area.

903.6.2 Nightclub. An automatic sprinkler system shall be provided throughout Group A-2 nightclubs as defined in this code. An existing nightclub constructed prior to July 1, 2006, shall be provided with automatic sprinklers not later than December 1, 2009.

907.2.9.1 Group R-2 boarding homes. A manual fire alarm system shall be installed in Group R-2 occupancies where the building contains a boarding home licensed by the state of Washington.

- EXCEPTION:
- In boarding homes licensed by the state of Washington, manual fire alarm boxes in resident sleeping areas shall not be required at exits if located at all constantly attended staff locations, provided such staff locations are visible, continuously accessible, located on each floor, and positioned so no portion of the story exceeds a horizontal travel distance of 200 feet to a manual fire alarm box.

909.6.3 Elevator shaft pressurization. Where elevator shaft pressurization is required to comply with Exception 6 of IBC Section 707.14.1, the pressurization system shall comply with and be maintained in accordance with IBC 707.14.2.

909.6.3.1 Activation. The elevator shaft pressurization system shall be activated by a fire alarm system which shall

include smoke detectors or other approved detectors located near the elevator shaft on each floor as approved by the building official and fire code official. If the building has a fire alarm panel, detectors shall be connected to, with power supplied by, the fire alarm panel.

909.6.3.2 Power system. The power source for the fire alarm system and the elevator shaft pressurization system shall be in accordance with Section 909.11.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-0900, filed 1/28/09, effective 7/1/10; 08-01-101, § 51-54-0900, filed 12/18/07, effective 4/1/08. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-0900, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.020, 19.27.031, 19.27.074 and chapters 19.27 and 34.05 RCW. 05-24-071, § 51-54-0900, filed 12/5/05, effective 7/1/06. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-0900, filed 12/17/03, effective 7/1/04.]

WAC 51-54-1000 Chapter 10—Means of egress.

1008.1.2 Door swing. Egress doors shall be side-hinged swinging.

EXCEPTIONS:

1. Private garages, office areas, factory and storage areas with an occupant load of 10 or less.
2. Group I-3 Occupancies used as a place of detention.
3. Critical or intensive care patient rooms within suites of health care facilities.
4. Doors within or serving a single dwelling unit in Groups R-2 and R-3 as applicable in Section 101.2.
5. In other than Group H Occupancies, revolving doors complying with Section 1008.1.3.1.
6. In other than Group H Occupancies, horizontal sliding doors complying with Section 1008.1.3.3 are permitted in a means of egress.
7. Power-operated doors in accordance with Section 1008.1.3.2.
8. Doors serving a bathroom within an individual sleeping unit in Group R-1.
9. In other than Group H Occupancies, manually operated horizontal sliding doors are permitted in a means of egress from spaces with an occupant load of 10 or less.

Doors shall swing in the direction of egress travel where serving an occupant load of 50 or more persons or a Group H Occupancy.

The opening force for interior side-swinging doors without closers shall not exceed a 5-pound (22 N) force. For other side-swinging, sliding, and folding doors, the door latch shall release when subjected to a 15-pound (67 N) force. The door shall be set in motion when subjected to a 30-pound (133 N) force. The door shall swing to a full-open position when subjected to a 15-pound (67 N) force. Forces shall be applied to the latch side.

1008.1.8.3 Locks and latches. Locks and latches shall be permitted to prevent operation of doors where any of the following exists:

1. Places of detention or restraint.
2. In buildings in occupancy Group A having an occupant load of 300 or less, Group B, F, M and S, and in places of religious worship, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

2.1 The locking device is readily distinguishable as locked.

2.2 A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters 1 inch (25 mm) high on a contrasting background; and

2.3 The use of the key-operated locking device is revocable by the fire code official for due cause.

3. Where egress doors are used in pairs, approved automatic flush bolts shall be permitted to be used, provided that the door leaf having the automatic flush bolts has no door-knob or surface-mounted hardware.

4. Doors from individual dwelling or sleeping units of Group R occupancies having an occupant load of 10 or less are permitted to be equipped with a night latch, dead bolt or security chain, provided such devices are openable from the inside without the use of a key or tool.

5. Approved, listed locks without delayed egress shall be permitted in nursing homes or portions of nursing homes, and boarding homes licensed by the state of Washington, provided that:

5.1 The clinical needs of one or more patients require specialized security measures for their safety;

5.2 The doors unlock upon actuation of the automatic sprinkler systems or automatic fire detection system;

5.3 The doors unlock upon loss of electrical power controlling the lock or lock mechanism;

5.4 The lock shall be capable of being deactivated by a signal from a switch located in an approved location; and

5.5 There is a system, such as a keypad and code, in place that allows visitors, staff persons and appropriate residents to exit. Instructions for exiting shall be posted within six feet of the door.

1009.12 Stairways in individual dwelling units. Stairs or ladders within an individual dwelling unit used for access to areas of 200 square feet (18.6 m²) or less, and not containing the primary bathroom or kitchen, are exempt from the requirements of Section 1009.

1014.2.2 Group I-2. Habitable rooms or suites in Group I-2 Occupancies shall have an exit access door leading directly to a corridor.

EXCEPTION: Rooms with exit doors opening directly to the outside at ground level.

1014.2.2.1 Definition. For the purposes of this section, a suite is defined as a cluster of rooms or spaces sharing common circulation. Partitions within a suite are not required to have smoke or fire-resistance-rated construction unless required by another section of this Code.

1014.2.3 Suites in patient sleeping areas. Patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites if one of the following conditions is met:

1. The intervening room within the suite is not used as an exit access for more than eight patient beds.

2. The arrangement of the suite allows for direct and constant visual supervision by nursing personnel.

1014.2.3.1 Area. Suites of sleeping rooms shall not exceed 5,000 square feet (465 m²).

1014.2.3.2 Exit access. Any patient sleeping room, or any suite that includes patient sleeping rooms, of more than 1,000 square feet (93 m²) shall have at least two exit access doors remotely located from each other.

1014.2.3.3 Travel distance. The travel distance between any point in a suite of sleeping rooms and an exit access door of that suite shall not exceed 100 feet (30,480 mm).

1014.2.4 Suites in areas other than patient sleeping areas. Areas other than patient sleeping areas in Group I-2 Occupancies shall be permitted to be divided into suites.

1014.2.4.1 Area. Suites of rooms, other than patient rooms, shall not exceed 10,000 square feet (929 m²).

1014.2.4.2 Exit access. Any rooms or suite of rooms, other than patient sleeping rooms, of more than 2,500 square feet (232 m²) shall have at least two exit access doors remotely located from each other.

1014.2.4.3 One intervening room. For rooms other than patient sleeping rooms, suites of rooms are permitted to have one intervening room if the travel distance within the suite is not greater than 100 feet (30,480 mm).

1014.2.4.4 Two intervening rooms. For rooms other than patient sleeping rooms located within a suite, exit access travel from within the suite shall be permitted through two intervening rooms where the travel distance to the exit access door is not greater than 50 feet (15,240 mm).

1014.2.5 Travel distance. The travel distance between any point in a Group I-2 Occupancy patient room and an exit access door in that room shall not exceed 50 feet (15,240 mm).

1014.2.6 Separation. Suites in Group I-2 Occupancies shall be separated from other portions of the building by a smoke partition complying with Section 710.

1015.1 Exits or exit access doorways from spaces. Two exits or exit access doorways from any space shall be provided where one of the following conditions exists:

1. The occupant load of the space exceeds one of the values in Table 1015.1.

EXCEPTION: One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

2. The common path of egress travel exceeds one of the limitations of Section 1014.3.

3. Where required by Sections 1015.3, 1015.4, 1015.5, 1015.6 or 1015.6.1.

EXCEPTION: Group I-2 Occupancies shall comply with Section 1014.2.2.

**TABLE 1015.1
SPACES WITH ONE MEANS OF EGRESS**

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E ^a , F, M, U	49
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

- a. Day care maximum occupant load is 10.

1015.1.1 Three or more exits or exit access doorways. Three exits or exit access doorways shall be provided from any space with an occupant load of 501-1,000. Four exits or exit access doorways shall be provided from any space with an occupant load greater than 1,000.

1019.1 Exits from stories. All spaces within each story shall have access to the minimum number of exits as specified in Table 1019.1 based on the occupant load of the story, except as modified in Section 1019.2. For the purposes of this chapter, occupied roofs shall be provided with exits as required for stories. The required number of exits from any story, including basements, shall be maintained until arrival at grade or the public way.

EXCEPTION: One means of egress is permitted within and from dwelling units with a maximum occupant load of 20 where the dwelling unit is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

**TABLE 1019.1
MINIMUM NUMBER OF EXITS FOR OCCUPANT LOAD**

OCCUPANT LOAD (persons per story)	MINIMUM NUMBER OF EXITS (per story)
1-500	2
501-1,000	3
More than 1,000	4

1019.2 Buildings with one exit. Only one exit shall be required in buildings as specified below:

1. Buildings meeting the limitations of Table 1019.2, provided the building has not more than one level below the first story above grade plane.
2. Buildings of Group R-3 Occupancy.
3. Single-level buildings with occupied spaces at the level of exit discharge provided each space complies with Section 1015.1 as a space with one exit or exit access doorway.

**TABLE 1019.2
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
A, B ^d , E ^c , F, M, U	1 Story	49 occupants and 75 feet travel distance
H-2, H-3	1 Story	3 occupants and 25 feet travel distance
H-4, H-5, I, R	1 Story	10 occupants and 75 feet travel distance
S ^a	1 Story	29 occupants and 100 feet travel distance
B ^b , F, M, S ^a	2 Stories	30 occupants and 75 feet travel distance

**TABLE 1019.2
BUILDINGS WITH ONE EXIT**

OCCUPANCY	MAXIMUM HEIGHT OF BUILDING ABOVE GRADE PLANE	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
R-2	2 Stories ^e	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

- a. For the required number of exits for open parking structures, see Section 1019.1.1.
- b. For the required number of exits for air traffic control towers, see Section 412.1.
- c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1026 shall have a maximum height of three stories above grade plane.
- d. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 with an occupancy in Group B shall have a maximum travel distance of 100 feet.
- e. Day care maximum occupant load is 10.

[Statutory Authority: RCW 19.27.190, 19.27.020, and chapters 19.27 and 34.05 RCW. 09-04-027, § 51-54-1000, filed 1/28/09, effective 7/1/10. Statutory Authority: RCW 19.27.031, 19.27.074, and chapters 19.27 and 34.05 RCW. 07-01-093, § 51-54-1000, filed 12/19/06, effective 7/1/07. Statutory Authority: RCW 19.27.031 and 19.27.074. 04-01-105, § 51-54-1000, filed 12/17/03, effective 7/1/04.]