

# **WASHINGTON STATE BUILDING CODE**

## **CHAPTER 51-51 WAC**

### **2021 INTERNATIONAL RESIDENTIAL CODE First Edition**



**Washington State Building Code Council**

**First Edition Effective March 15, 2024**

Copies of the State Building Codes and  
complete copies of the 2021 International Residential Code  
as published by the International Code Council  
may be obtained from:

Washington Association of Building Officials  
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First Edition  
International Residential Code  
Chapter 51-51 WAC  
Effective March 15, 2024  
Second Edition based on  
WSR 23-23-104

## *Preface*

**Authority:** The International Residential Code (Chapter 51-51 WAC) is adopted by the Washington State Building Code Council pursuant to Chapters 19.27 and 70.92 RCW. The Washington State Building Code was first adopted by reference by the Washington State Legislature in 1974. In 1985, the Legislature delegated the responsibility of adoption and amendment of these codes to the State Building Code Council. The first adoption of the International Residential Code was in 2004.

**Code Precedence:** The State Building Code Act, Chapter 19.27 RCW, establishes the following order of precedence among the documents adopted as parts of the State Building Code:

International Building Code, Standards and amendments – WAC 51-50;

International Residential Code, Standards and amendments – WAC 51-51;

International Mechanical Code, Standards and amendments – WAC 51-52;

International Fire Code, Standards and amendments – WAC 51-54A;

Washington Wildland-Urban Interface Code – WAC 51-55;

Uniform Plumbing Code, Standards and amendments – WAC 51-56.

Where there is a conflict between codes, an earlier named code takes precedence over a later named code. In the case of conflict between the duct insulation requirements of the International Mechanical Code and the duct insulation requirements of the Energy Code, the Energy Code, or where applicable, a local jurisdiction's energy code, shall govern.

Where, in any specific case, different sections of this Code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is conflict between a general requirement and a specific requirement, the specific requirement shall be applicable.

**Organization and Numbering:** These rules are written to allow compatible use with the International Mechanical Code. All sections which are amended, deleted, or added are referenced.

**Enforcement:** The State Building Code Act requires that each local jurisdiction enforce the State Building Code within its jurisdiction. Any jurisdiction can contract with another jurisdiction or an inspection agency to provide the mandated enforcement activities.

### **Amendments to the State Building Code:**

The State Building Code Council has adopted review procedures and approval criteria for local amendments. These procedures and criteria are found in Chapter 51-04 WAC. The Council has exempted from its review any amendments to the administrative provisions of the various codes.

Forms for proposing statewide amendments to the State Building Code are available from the State Building Code Council staff.

- A. **Amendments of Statewide Application:** On a yearly basis the State Building Code Council will consider proposals to amend the State Building Code. The Council is not scheduled to enter formal rulemaking until 2021 as part of its consideration of adoption of the 2021 series of codes.

Proposals to amend the State Building Code shall be made on forms provided by the Building Code Council.

- B. **Local Amendments:** Any jurisdiction may amend the State Building Code provided the amendments do not reduce the minimum performance standards of the codes. There are two areas where local amendments are limited or prohibited:

**Prohibited Amendments:** Residential provisions of the State Energy Code (WAC 51-11R and WAC 51-11C); any provision of the International Building Code or International Residential Code affecting accessibility; and standards specifically adopted in Chapters 19.27 and 19.27A WAC cannot be amended by any local jurisdiction.

**Residential Amendments:** Amendments by local jurisdictions which affect the construction of single family and multi-family residential buildings must be reviewed and approved by the State Building Code Council before such amendments can be enforced. The State Building Code Act provides the following definition:

Multi-family residential building: means common wall residential buildings that consist of four or fewer units, that do not exceed two stories in height, that are less than 5,000 square feet in area, and that have a one-hour fire-resistive occupancy separation between units.

Application forms for Council review of local amendments are available from the State Building Code Council Staff.

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**Printing Format:** This version of the rules is published as a series of insert or replacement pages and is intended to be printed as a two-sided document. Each page provides instructions for installing them in the model code book. Amendments to the model code, are indicated by a double line in the margin next to the revised portions. Any portion of the model code that has been deleted in the amendment will be marked with a > symbol

**Effective Date:** These rules were adopted by the State Building Code Council on November 18, 2022. The rules are effective throughout the state on March 15, 2024. This code is based on WAC 51-51 as published in WSR 23-23-104. It is subject to review by the State Legislature during the 2024 session.

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**Building Permit Fees:** The activities of the State Building Code Council are supported by permit fees collected by each city and county. Section 19.27.085 of the State Building Code Act requires that a fee of \$6.50 be imposed on each residential permit and \$25.00 on each commercial building permit issued by each city and county. In addition, a fee of \$2.00 per unit shall be imposed for each dwelling unit after the first unit, on each building containing more than one residential unit. For the purpose of this fee, WAC 365-110-035 defines building permits as any permit to construct, enlarge, alter, repair, move, improve, remove, convert or demolish any building or structure regulated by the Building Code. Exempt from the fee are plumbing, electrical, mechanical permits, permits issued to install a mobile/manufactured home, commercial coach or factory built structure, or permits issued pursuant to the International Fire Code.

Each city and county shall remit moneys collected to the state treasury quarterly. No remittance is required until a minimum of \$50.00 has accumulated.

These permit fees are the amounts current in January 2020. Such fees may be changed by the State Legislature.

**Opinions:** RCW 19.27.031 grants the council authority to render opinions relating to the building code at the request of a local code official. For the purposes of this section, the term "code official" means the local or state official, or their designee, responsible for implementation and enforcement of the specific code provision on which the opinion is requested.

At the request of a code official, the council will issue opinions relating to the codes adopted under chapters 19.27, 19.27A, and 70.92 RCW, and council amendments to the model codes. At the request of a local code official, the council may issue opinions on the applicability of WAC 51-04-030 to a local government ordinance regulating construction. Council related opinions may be developed and approved by a standing committee of the council. Opinions approved by a standing committee may be reviewed and modified by the council.

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**Authority.**

These rules are adopted under the authority of chapter [19.27](#) RCW.

**Purpose.**

The purpose of these rules is to implement the provisions of chapter [19.27](#) RCW, which provides that the state building code council shall maintain the State Building Code in a status which is consistent with the purpose as set forth in RCW [19.27.020](#). In maintaining the codes the council shall regularly review updated versions of the codes adopted under the act, and other pertinent information, and shall amend the codes as deemed appropriate by the council.

**International Residential Code.**

The 2021 edition of the *International Residential Code* as published by the International Code Council is hereby adopted by reference with the following additions, deletions, and exceptions: Provided that chapters 11 and 25 through 43 of this code are not adopted. Energy Code is regulated by chapter 51-11R WAC; Plumbing Code is regulated by chapter 51-56 WAC; Electrical Code is regulated by chapter 296-46B WAC or Electrical Code as adopted by the local jurisdiction. Appendix AF, Radon Control Methods, Appendix AQ, Tiny Homes, and Appendix AWU, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

**Exceptions.**

The exceptions and amendments to the International Residential Code contained in the provisions of chapter [19.27](#) RCW shall apply in case of conflict with any of the provisions of these rules.

The provisions of this code do not apply to temporary growing structures used solely for the commercial production of horticultural plants including ornamental plants, flowers, vegetables, and fruits. "Temporary growing structure" means a structure that has the sides and roof covered with polyethylene, polyvinyl, or similar flexible synthetic material and is used to provide plants with either frost protection or increased heat retention. A temporary growing structure is not considered a building for purposes of this code.

The provisions of this code do not apply to the construction, alteration, or repair of temporary worker housing except as provided by rule adopted under chapter [70.114A](#) RCW or chapter 37, Laws of 1998 (SB 6168). "Temporary worker housing" means a place, area, or piece of land where sleeping places or housing sites are provided by an employer for his or her employees or by another person, including a temporary worker housing operator, who is providing such accommodations for employees, for temporary, seasonal occupancy, and includes "labor camps" under RCW [70.54.110](#).

Codes referenced which are not adopted through RCW [19.27.031](#) or chapter [19.27A](#) RCW shall not apply unless specifically adopted by the authority having jurisdiction.

The standards for liquefied petroleum gas installations shall be NFPA 58 (Liquefied Petroleum Gas Code) and NFPA 54 (National Fuel Gas Code). All other fuel gas installations shall be regulated by the International Mechanical Code and International Fuel Gas Code.

**Implementation.**

The International Residential Code adopted by chapter 51-51 WAC shall become effective in all counties and cities of this state on March 15, 2024.

**R101.2 Scope.** The provisions of the *International Residential Code for One- and Two-Family Dwellings* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, *equipment*, use and occupancy, location, removal and demolition of detached one- and two-family dwellings, adult family homes, and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above *grade plane* in height.

- EXCEPTIONS:**
1. Live/work units located in *townhouses* and complying with the requirements of Section 508.5 of the *International Building Code* shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings*. An automatic sprinkler system required by Section 508.5.7 of the *International Building Code* where constructed under the *International Residential Code for One- and Two-Family Dwellings* shall conform to Appendix AWU.
  2. Owner-occupied lodging houses with one or two guestrooms shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings*.
  3. Owner-occupied lodging homes with three to five guestrooms shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings* where equipped with an automatic fire sprinkler system in accordance with Appendix AWU.
  4. A care facility with five or fewer persons receiving custodial care within a dwelling unit shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings* where equipped with an automatic fire sprinkler system in accordance with Appendix AWU.
  5. A care facility with five or fewer persons receiving medical care within a dwelling unit shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings* where equipped with an automatic fire sprinkler system in accordance with Appendix AWU.
  6. A care facility with five or fewer persons receiving care that are within a single-family dwelling shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings* where equipped with an automatic fire sprinkler system in accordance with Appendix AWU.

**R102.5 Appendices.** Provisions in the appendices shall not apply unless specifically referenced in the adopting ordinance. An appendix adopted by a local jurisdiction shall not be effective unless approved by the state building code council pursuant to RCW 19.27.060 (1)(a).

**EXCEPTIONS:**

1. The state building code council has determined that a local ordinance providing specifications for light straw-clay or strawbale construction, requiring a solar-ready zone, requiring fire sprinklers, or addressing construction and demolition material management or building deconstruction in accordance with Appendix AR, AS, AT, AWV, AWY, OR AWZ of this code may be adopted by any local government upon notification of the council.
2. Appendix AF, Radon Control Methods, Appendix AQ, Tiny Homes, and Appendix AWU, Dwelling Unit Fire Sprinkler Systems, are included in adoption of the International Residential Code.

**R102.7.1 Additions, alterations, change of use, repairs, or relocations.** Additions, alterations, repairs, or relocations shall be permitted to conform to the requirements of the provisions of Chapter 45 or shall conform to the requirements for new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. Additions, alterations, repairs, and relocations shall not cause an existing structure to become less compliant with the provisions of this code than the existing building or structure was prior to the addition, alteration, repair, or relocation. Where additions, alterations, or changes of use to an existing structure result in a use or occupancy, height, or means of egress outside the scope of this code, the building shall comply with the *International Existing Building Code*.

**EXCEPTIONS:**

1. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for Whole-House Ventilation Systems, Section M1505.4.
2. Additions or alterations to existing buildings which do not require the construction of foundations, crawlspaces, slabs or basements shall not be required to meet the requirements for radon protection in Section R332.1 and Appendix AF.

**R102.7.2 Moved buildings.** Buildings or structures moved into or within a jurisdiction shall comply with the provisions of this code, the *International Building Code* (chapter 51-50 WAC), the International Mechanical Code (chapter 51-52 WAC), the International Fire Code (chapter 51-54A WAC), the Uniform Plumbing Code and Standards (chapter 51-56 WAC), and the Washington State Energy Code (chapter 51-11R WAC) for new buildings or structures.

**EXCEPTION:** Group R-3 buildings or structures are not required to comply if:

1. The original occupancy classification is not changed; and
2. The original building is not substantially remodeled or rehabilitated. For the purposes of this section a building shall be considered to be substantially remodeled when the costs of remodeling exceed 60 percent of the value of the building exclusive of the costs relating to preparation, construction, demolition or renovation of foundations.

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**ADULT FAMILY HOME.** A dwelling, licensed by the state of Washington department of social and health services, 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. An existing adult family home may provide services to up to eight adults upon approval from the department of social and health services in accordance with RCW [70.128.066](#).

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**BUILDING.** Any one- or two-family dwelling or *townhouse*, or portion thereof used or intended to be used for human habitation, for living, sleeping, cooking or eating purposes, or any combination thereof, or any accessory structure.

||

**BUILDING, EXISTING.** A building or structure erected prior to the adoption of this code, or one that has passed a final inspection.

||

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

||

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

||



**CONDITIONED SPACE.** An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

**DISTRIBUTED WHOLE-HOUSE VENTILATION.** A whole house ventilation system shall be considered distributed when it supplies outdoor air directly (not transfer air) to each dwelling or sleeping unit habitable space (living room, den, office, interior adjoining spaces or bedroom), and exhausts air from all kitchens and bathrooms directly outside.

**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 (46.4 m2).

**EGRESS ROOF ACCESS WINDOW.** A skylight or roof window designed and installed to satisfy the *Emergency Escape and Rescue Opening* requirements of Section R310.2.

**ENCLOSED KITCHEN.** A kitchen whose permanent openings to interior adjacent spaces do not exceed a total of 60 square feet (6 m2).

**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.



**FLOOR AREA.** The area within the inside perimeter of exterior walls of the building. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above.



**LANDING PLATFORM.** A landing provided as the top step of a stairway accessing a *Loft*.

||

**LOCAL EXHAUST.** An exhaust system that uses one or more fans to exhaust air from a specific room or rooms within a residential dwelling or sleeping unit.

||

**LOFT.** A space on an intermediate level or levels between the floor and ceiling of a dwelling or sleeping unit, open on one or more sides to the room or space in which the loft is located, and in accordance with Section R333.

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**LOT LINE.** The line which bounds a plot of ground described as a *lot* in the title to the property.

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**SALT WATER COASTAL AREA.** Those areas designated as salt water coastal areas by the local jurisdiction.

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**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.



**TOWNHOUSE UNIT.** A single-family *dwelling unit* in a *townhouse* that extends from foundation to roof and that has a yard or public way on not less than two sides that extends at least 50 percent of the length of each of these two sides.



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**R301.2 Climatic and geographic design criteria.** Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2. The local jurisdiction shall designate the salt water coastal areas within their jurisdiction.



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**R301.2.2.10 Anchorage of water heaters.** In Seismic Design Categories D0, D1 and D2, and in townhouses in Seismic Design Category C, water heaters and thermal storage units shall be anchored against movement and overturning in accordance with Section M1307.2 or the Uniform Plumbing Code Section 507.2.



**R301.5 Live load.** The minimum uniformly distributed live load shall be as provided in Table R301.5.

**TABLE R301.5**  
**MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS**  
**(in pounds per square foot)**

Use	Uniform Load (psf)	Concentrated Load (lb)
Uninhabitable attics without storage <sup>b</sup>	10	-
Uninhabitable attics with limited storage <sup>b, g</sup>	20	-
Habitable attics and attics served with fixed stairs	30	-
Balconies (exterior) and decks <sup>e</sup>	60 <sup>j</sup>	-
Fire escapes	40	-
Guards	-	200 <sup>h, i</sup>
Guard in-fill components <sup>f</sup>	-	50 <sup>h</sup>
Handrail <sup>d</sup>	-	200 <sup>h</sup>
Passenger vehicle garages	50	2,000 <sup>a</sup>
Areas other than sleeping areas	40	-
Sleeping areas	30	-
Stairs	40 <sup>c</sup>	300 <sup>c</sup>

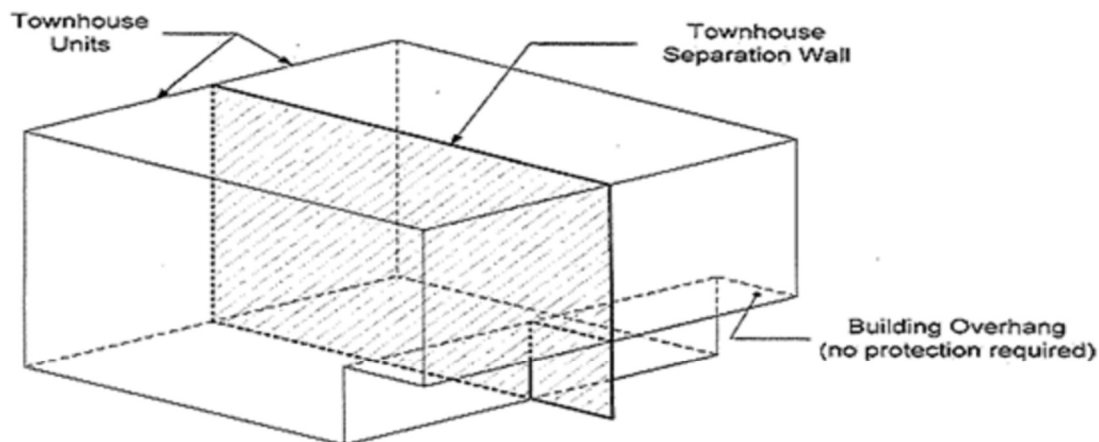
For SI: 1 pound per square foot = 0.0479 kPa, 1 square inch = 645 mm, 1 pound = 4.45 N

- a. Elevated garage floors shall be capable of supporting the uniformly distributed live load or a 2,000-pound concentrated load applied on an area of 4-1/2 inches by 4-1/2 inches, whichever produces the greater stresses.
- b. Uninhabitable attics without storage are those where the clear height between joists and rafters is not more than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.
- c. Individual stair treads shall be capable of supporting the uniformly distributed live load or a 300-pound concentrated load applied on an area of 2 inches by 2 inches, whichever produces the greater stresses.
- d. A single concentrated load applied in any direction at any point along the top. For a guard not required to serve as a handrail, the load need not be applied to the top element of the guard in a direction parallel to such element.
- e. See Section R507.1 for decks attached to exterior walls.
- f. Guard in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.
- g. Uninhabitable attics with limited storage are those where the clear height between joists and rafters is 42 inches or greater, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. The live load need only be applied to those portions of the joists or truss bottom chords where all of the following conditions are met:
  - g1. The attic area is accessed from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the attic is not less than 30 inches.
  - g2. The slopes of the joists or truss bottom chords are not greater than 2 units vertical to 12 units horizontal.
  - g3. Required insulation depth is less than the joist or truss bottom chord member depth. The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.
- h. Glazing used in handrail assemblies and guards shall be designed with a load adjustment factor of 4. The load adjustment factor shall be applied to each of the concentrated loads applied to the top of the rail, and to the load on the in-fill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.
- i. Where the top of a guard system is not required to serve as a handrail, the single concentrated load shall be applied at any point along the top, in the vertical downward direction and in the horizontal direction away from the walking surface. Where the top of a guard is also serving as the handrail, a single concentrated load shall be applied in any direction at any point along the top. Concentrated loads shall not be applied concurrently.
- j. Where structural tables in Section R507 only specify snow loads, the values corresponding to 70 psf snow loads shall be used.

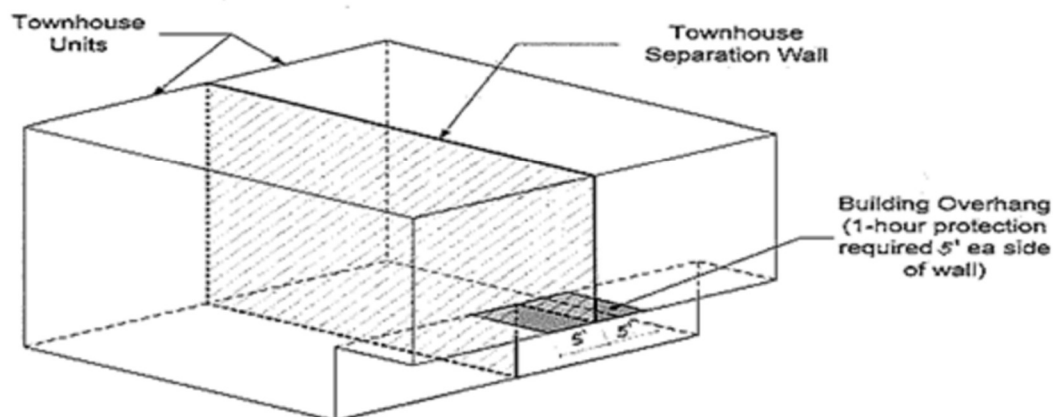
**R302.2.2 Common walls.** Common walls separating *townhouse units* shall be assigned a fire resistance rating in accordance with Item 1 or 2 and shall be rated for fire exposure from both sides. Common walls shall extend to and be tight against the exterior sheathing of the exterior walls, or the inside face of exterior walls without stud cavities, and the underside of the roof sheathing. The common wall shared by two *townhouse units* shall be constructed without plumbing or mechanical equipment, ducts or vents, other than water-filled fire sprinkler piping in the cavity of the common wall. Electrical installations shall be in accordance with chapter 296-46B WAC, Electrical safety standards, administration, and installation. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.

1. Where an automatic sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the *International Building Code*.
2. Where an automatic sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the *International Building Code*.

**EXCEPTION:** Common walls are permitted to extend to and be tight against the interior side of the exterior walls if the cavity between the end of the common wall and the exterior sheathing is filled with a minimum of 2-inch nominal thickness wood studs.



**FIGURE R302.2(1)  
EXTENDED TOWNHOUSE SEPARATION WALL**



**FIGURE R302.2(2)  
TOWNHOUSE SEPARATION OVERHANG PROTECTION**



**TABLE R302.1(1)**  
**EXTERIOR WALLS**

No Change to the Table

- a.** The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
- b.** The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where ventilation openings are not installed in the rake overhang or in walls that are common to attic areas.

**TABLE R302.1(2)**  
**EXTERIOR WALLS - DWELLINGS WITH FIRE SPRINKLERS**

No Change to the Table

- a.** For residential subdivisions where all dwellings are equipped throughout with an automatic sprinkler system installed in accordance with Section P2904, the fire separation distance for exterior walls not fire-resistance-rated and for fire-resistance-rated projections shall be permitted to be reduced to 0 feet, and unlimited unprotected openings and penetrations shall be permitted, where the adjoining lot provides an open setback yard that is 6 feet or more in width on the opposite side of the property line.
- b.** The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave overhang if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
- c.** The fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the rake overhang where ventilation openings are not installed in the rake overhang or in walls that are common to attic areas.

**R302.2.3 Continuity.** The fire-resistance-rated wall or assembly separating *townhouse units* shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures*.

Where a story extends beyond the exterior wall of a story below:

1. The fire-resistance-rated wall or assembly shall extend to the outside edge of the upper story (see Figure R302.2(1)); or
2. The underside of the exposed floor-ceiling assembly shall be protected as required for projections in Section R302 (see Figure R302.2(2)).

**R302.2.4 Parapets for townhouses.** Parapets constructed in accordance with Section R302.2.5 shall be constructed for *townhouses* as an extension of exterior walls or common walls separating *townhouse units* in accordance with the following:

1. Where roof surfaces adjacent to the wall or walls are at the same elevation, the parapet shall extend not less than 30 inches (762 mm) above the roof surfaces.
2. Where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is not more than 30 inches (762 mm) above the lower roof, the parapet shall extend not less than 30 inches (762 mm) above the lower roof surface.

**EXCEPTION:** A parapet is not required in the preceding two cases where the roof covering complies with a minimum Class C rating as tested in accordance with ASTM E108 or UL 790 and the roof decking or sheathing is of noncombustible materials or fire retardant-treated wood for a distance of 4 feet (1219 mm) on each side of the wall or walls, or one layer of 5/8-inch (15.9 mm) Type X gypsum board is installed directly beneath the roof decking or sheathing, supported by not less than nominal 2-inch (51 mm) ledgers attached to the sides of the roof framing members, for a distance of not less than 4 feet (1219 mm) on each side of the wall or walls and any openings or penetrations in the roof are not within 4 feet (1219 mm) of the common walls. Fire retardant-treated wood shall meet the requirements of Sections R802.1.5 and R803.2.1.2.

3. A parapet is not required where roof surfaces adjacent to the wall or walls are at different elevations and the higher roof is more than 30 inches (762 mm) above the lower roof. The common wall construction from the lower roof to the underside of the higher roof deck shall have not less than a 1-hour fire-resistance rating. The wall shall be rated for exposure from both sides.

**R302.3 Two-family dwellings.** Wall and floor/ceiling assemblies separating *dwelling units* in two-family dwellings shall be constructed in accordance with Section R302.3.1 through R302.3.5. One accessory dwelling unit constructed within an existing *dwelling unit* need not be considered a separated dwelling unit in a two-family dwelling where all required smoke alarms, in the accessory dwelling unit and the primary dwelling unit, are interconnected in such a manner that the actuation of one alarm will activate all alarms in both the primary dwelling unit and the accessory dwelling unit.

**R302.3.1 Separation.** *Dwelling units* in two-family dwellings shall be separated from each other by wall and floor assemblies having not less than a 1-hour fire-resistance rating where tested in accordance with ASTM E119, UL 263 or Section 703.2.2 of the *International Building Code*.

**EXCEPTIONS:**

1. A fire-resistance rating of 1/2 hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904.
2. Where an accessory dwelling unit is added within an existing single-family residence to create a two-family dwelling, fire rated separation between the accessory dwelling unit and the primary dwelling unit is not required when all required smoke alarms are interconnected in such a manner that the actuation of one alarm will activate all alarms in both the primary dwelling unit and the accessory dwelling unit.

**R302.3.2 Continuity.** Fire-resistance-rated floor/ceiling and wall assemblies shall extend to and be tight against the *exterior wall*, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

**EXCEPTION:** Wall assemblies need not extend through attic spaces where the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board, an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the dwellings and the structural framing supporting the ceiling is protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

**R302.3.3 Supporting construction.** Where floor/ceiling assemblies are required to be fire-resistance rated by Section R302.3, the supporting construction of such assemblies shall have an equal or greater fire-resistance rating.

**R302.3.4 Openings protection between two-family dwellings.** Openings in the common fire-resistance-rated wall assembly located between units of a two-family dwelling shall be equipped with not less than a 45-minute fire-rated door assembly equipped with a self-closing or automatic-closing device.

**EXCEPTION:** A 20-minute fire-rated door assembly is permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904 or NFPA 13D.

**R302.3.5 Shared accessory rooms.** Shared accessory rooms shall be separated from each individual dwelling unit in accordance with Table R302.3.5. Openings between the shared accessory room and the dwelling unit shall comply with Section R302.3.5.1. Attachment of gypsum board shall comply with Table R702.3.5.

**R302.3.5.1 Opening protection.** Openings from a shared accessory room or area directly into a room used for sleeping purposes shall not be permitted. Other openings between the shared accessory room or area shall be equipped with solid wood doors not less than 1 3/8 inches in thickness, solid or honeycomb core steel doors not less than 1 3/8 inches thick, or a fire door assembly with a 20-minute fire-protection rating, equipped with a self-closing or automatic-closing device.

**R302.3.5.2 Duct penetration.** Ducts penetrating the walls or ceilings separating the dwelling from the shared accessory room shall be constructed of a minimum No. 26 gage (0.48 mm) sheet steel or other approved material and shall not have openings into the shared accessory room.

**R302.3.5.3 Other penetrations.** Penetrations through the walls, ceiling, and floor level separation required in Section R302.3.5 shall be protected as required by Section R302.11, Item 4.

**TABLE R302.3.5**  
**DWELLING-SHARED ACCESSORY ROOM SEPARATION**

<b>SEPARATION</b>	<b>MATERIAL</b>
From the dwelling units and attics.	Not less than 1/2-inch gypsum board or equivalent applied to the accessory room side wall.
From habitable rooms above or below the shared accessory room.	Not less than 5/8-inch Type X gypsum board or equivalent.
Structures supporting floor/ceiling assemblies used for separation required by this section.	Not less than 1/2-inch gypsum board or equivalent.

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**R302.13 Fire protection of floors.** Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a 1/2-inch (12.7 mm) gypsum wallboard membrane, 5/8-inch (16 mm) wood structural panel membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted.

**EXCEPTIONS:**

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Appendix AWU, NFPA 13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.
3. Portions of floor assemblies shall be permitted to be unprotected when complying with the following:
  - 3.1. The aggregate area of the unprotected portions shall not exceed 80 square feet (7.4 m<sup>2</sup>) per story.
  - 3.2. Fire blocking in accordance with Section R302.11.1 is installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.
4. Wood floor assemblies using dimension lumber or *structural composite lumber* with a cross sectional area equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

**R303.1 Natural light.** All habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms.

**EXCEPTION:** The glazed areas need not be installed in rooms where artificial light is provided capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

**R303.2 Adjoining rooms.** For the purpose of determining light requirements, any room shall be considered as a portion of an adjoining room when at least one-half of the area of the common wall is open and unobstructed and provides an opening of not less than one-tenth of the floor area of the interior room but not less than 25 square feet (2.3 m<sup>2</sup>).

**EXCEPTION:** Openings required for light shall be permitted to open into a sunroom with thermal isolation or a patio cover, provided there is an openable area between the adjoining room and the sunroom or a patio cover of not less than one-tenth of the floor area of the interior room but not less than 20 square feet (2 m<sup>2</sup>).

**R303.3 Bathrooms.** This section is not adopted.

**R303.4 Minimum ventilation performance.** Dwelling units shall be equipped with local exhaust and whole house ventilation systems designed and installed as specified in Section M1505.

**EXCEPTION:** Additions with less than 500 square feet of conditioned floor area are exempt from the requirements in this Code for Whole House Ventilation Systems.

**R303.5.1 Intake openings.** Mechanical and gravity outdoor air intake openings shall be located a minimum of 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks, except as otherwise specified in this code. For the purpose of this section, the exhaust from *dwelling unit* toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

**EXCEPTIONS:**

1. The 10-foot (3048 mm) separation is not required where the intake opening is located 3 feet (914 mm) or greater below the contaminant source.
2. Vents and chimneys serving fuel-burning appliances shall be terminated in accordance with the applicable provisions of Chapters 18 and 24.
3. Clothes dryer exhaust ducts shall be terminated in accordance with Section M1502.3.

**R303.5.2 Exhaust openings.** Exhaust air shall not be directed onto walkways. All exhaust ducts shall terminate outside the building. Terminal elements shall have at least the equivalent net free area of the duct work.

**R303.5.2.1 Exhaust ducts.** Exhaust ducts shall be equipped with back-draft dampers. All exhaust ducts in unconditioned spaces shall be insulated to a minimum of R-4.

**R303.7 Interior stairway illumination.** Interior stairways shall be provided with an artificial light source to illuminate the landings and treads. Stairway illumination shall receive primary power from the building wiring. The light source shall be capable of illuminating treads and landings to levels not less than 1 foot-candle (11 lux) measured at the center of treads and landings. There shall be a wall switch at each floor level to control the light source where the stairway has six or more risers.

**EXCEPTION:** A switch is not required where remote, central or automatic control of lighting is provided.

**R303.8 Exterior stairway illumination.** Exterior stairways shall be provided with an artificial light source located at the top landing of the stairway. Stairway illumination shall receive primary power from the building wiring. Exterior stairways providing access to a basement from the outdoor grade level shall be provided with an artificial light source located at the bottom landing of the stairway.

**R303.9 Required glazed openings.** Required glazed openings shall open directly onto a street or public alley, or a yard or court located on the same lot as the building.

**EXCEPTIONS:**

1. Required glazed openings that face into a roofed porch where the porch abuts a street, yard or court are permitted where the longer side of the porch is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).
2. Eave projections shall not be considered as obstructing the clear open space of a yard or court.
3. Required glazed openings that face into the area under a deck, balcony, bay or floor cantilever are permitted where an unobstructed pathway of not less than 36 inches (914 mm) in height, 36 inches (914 mm) in width, and no greater than 60 inches (1524 mm) in length is provided and opens to a yard or court. The pathway shall be measured from the exterior face of the glazed opening, or if the glazed opening is in a window well, at the window well wall furthest from the exterior face of the glazed opening.

**R303.10 Required heating.** When the winter design temperature in Table R301.2 is below 60°F (16°C), every *dwelling unit* shall be provided with heating facilities capable of maintaining a minimum room temperature of 68°F (20°C) at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in all habitable rooms at design temperature. The installation of one or more portable heaters shall not be used to achieve compliance with this section.

**EXCEPTION:** Unheated recreational tents or yurts not exceeding 500 square feet provided it is not occupied as a permanent dwelling.

**R303.10.1 Definitions.** For the purposes of this section only, the following definitions apply.

**DESIGNATED AREAS** are those areas designated by a county to be an urban growth area in chapter [36.70A](#) RCW and those areas designated by the U.S. Environmental Protection Agency as being in nonattainment for particulate matter.

**SUBSTANTIALLY REMODELED** means any alteration or restoration of a building exceeding 60 percent of the appraised value of such building within a 12-month period. For the purpose of this section, the appraised value is the estimated cost to replace the building and structure in kind, based on current replacement costs.

**R303.10.2 Primary heating source.** Primary heating sources in all new and substantially remodeled buildings in designated areas shall not be dependent upon wood stoves.

**R303.10.3 Solid fuel burning devices.** No new or used solid fuel burning device shall be installed in new or existing buildings unless such device is U.S. Environmental Protection Agency certified or exempt from certification by the United States Environmental Protection Agency and conforms with RCW [70A.15.1005](#), [70A.15.3500](#), [70A.15.3510](#), and [70A.15.3530](#).

**EXCEPTIONS:**

1. Wood cook stoves.
2. Antique wood heaters manufactured prior to 1940.

**R307.1 Space required.** Fixtures shall be spaced in accordance with Figure R307.1, and in accordance with the requirements of the state plumbing code Section 402.5.



### **R309.6 Electric vehicle charging.**

**R309.6.1 Application.** The provisions of this section shall apply to the construction of new dwelling units per Section R101.2 with attached private garages or attached private carports.

**EXCEPTION:** Where there is no public utility or commercial power supply.

**R309.6.2 Dedicated circuit for electric vehicle charging.** A minimum of one 40-ampere dedicated 208/240-volt branch circuit shall be installed in the electrical panel for each dwelling unit. The branch circuit shall terminate at a junction box, receptacle outlet, or electric vehicle charging equipment.

**R310.1 Emergency escape and rescue opening required.** Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court providing an unobstructed path with a width of not less than 36 inches (914 mm) that opens to a public way.

**EXCEPTIONS:**

1. Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m).
2. Where the *dwelling unit* or *townhouse unit* is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:
  - 2.1. One means of egress complying with Section R311 and one emergency escape and rescue opening.
  - 2.2. Two means of egress complying with Section R311.
3. A yard shall not be required to open directly into a public way where the yard opens to an unobstructed path from the yard to the public way. Such path shall have a width of not less than 36 inches (914 mm). The following shall not be considered obstructions:
  - 3.1. Gates with operational constraints and opening control devices without the use of keys, tools, or special knowledge.
  - 3.2. Window wells equipped with a removable cover complying with Section R310.4.4.

**R310.2.4 Emergency escape and rescue openings under decks, porches, and cantilevers.** Emergency escape and rescue openings installed under decks, porches, and cantilevers shall be fully openable and provided with an unobstructed pathway of not less than 36 inches (914 mm) in height, 36 inches (914 mm) in width, and no greater than 60 inches (1524 mm) in length that opens to a yard or court. The pathway shall be measured from the exterior face of the glazed opening, or if the glazed opening is in a window well, at the window well wall furthest from the exterior face of the glazed opening.

**R310.5 Replacement windows for emergency escape and rescue openings.** This section is not adopted.



**R311.4 Vertical egress.** Egress from habitable levels including habitable attics and basements not provided with an egress door in accordance with Section R311.2 shall be by a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

**EXCEPTION:** Stairways, alternating tread devices, ship's ladders, or ladders within an individual dwelling unit or sleeping unit used for access to areas of 200 square feet (18.6 m<sup>2</sup>) or less, are exempt from the requirements of Sections R311.4 and R311.7, where such devices do not provide exclusive access to a kitchen or bathroom. Such areas shall not be located more than 10 feet (3048 mm) above the finished floor of the space below.

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**R311.7.11 Alternating tread devices.** Alternating tread devices shall not be used as an element of a means of egress. Alternating tread devices shall be permitted provided that a required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

**EXEPTION:** Not adopted

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**R311.7.12 Ship's ladders.** Ship's ladders shall not be used as an element of a means of egress. Ship's ladders shall be permitted provided that a required means of egress stairway or ramp serves the same space at each adjoining level or where a means of egress is not required. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

**EXEPTION:** Not adopted

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**R312.1.1 Where required.** *Guards* shall be provided for those portions of open-sided walking surfaces, including floors, mezzanines, *lofts* in accordance with Section R333, stairs, ramps, and landings, that are located more than 30 inches (762 mm) measured vertically to the floor or *grade* below at any point within 36 inches (914 mm) horizontally to the edge of the open side. Insect screening shall not be considered as a *guard*.

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**R312.1.2 Height.** Required *guards* at open-sided walking surfaces, including stairs, porches, balconies or landings, shall be not less than 36 inches (914 mm) in height as measured vertically above the adjacent walking surface or the line connecting the *nosings*.

**EXCEPTIONS:**

1. *Guards* on the open sides of stairs shall have a height of not less than 34 inches (864 mm) measured vertically from a line connecting the *nosings*.
2. Where the top of the *guard* serves as a handrail on the open sides of stairs, the top of the *guard* shall be not less than 34 inches (864 mm) and not more than 38 inches (965 mm) as measured vertically from a line connecting the *nosings*.
3. In areas with ceiling heights of 7 feet (2134 mm) or less in *lofts* constructed in accordance with Section R333, *guards* shall not be less than 36 inches (914 mm) in height or one-half of the clear height from the *loft* floor to the *loft* ceiling, whichever is less.

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**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in a townhouse unit.

**EXCEPTIONS:**

1. An automatic residential fire sprinkler system shall not be required where additions or alterations are made to an existing *townhouse unit* that does not have an automatic residential fire sprinkler system installed.
2. *Townhouse* buildings containing no more than four *townhouse units*.

**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for a townhouse unit shall be designed and installed in accordance with Section P2904 or NFPA 13D.

**R313.2 One- and two-family dwellings automatic sprinkler systems.** This section is not adopted.

## **Section 314 – Smoke Alarms and Heat Detection**

**R314.1 General.** Smoke alarms, heat detectors, and heat alarms shall comply with NFPA 72 and this section.

**R314.1.1 Listings.** Smoke alarms shall be listed in accordance with UL 217. Heat detectors and heat alarms shall be listed for the intended application. Combination smoke and carbon monoxide alarms shall be listed in accordance with UL 217 and UL 2034.

**R314.2 Where required.** Smoke alarms, heat detectors, and heat alarms shall be provided in accordance with this section.

**R314.2.1 New construction.** Smoke alarms shall be provided in *dwelling units*. A heat detector or heat alarm shall be provided in new attached garages.

**R314.2.2 Alterations, repairs and additions.** Where *alterations*, *repairs* or *additions* requiring a permit occur, or where one or more sleeping rooms are added or created in existing dwellings, or where an accessory dwelling unit is created within an existing *dwelling unit*, each *dwelling unit* shall be equipped with smoke alarms as required for new dwellings.

**EXCEPTIONS:**

1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, the *addition* or replacement of windows or doors, or the addition of a porch or deck are exempt from the requirements of this section.
2. Installation, *alteration* or repairs of plumbing, electrical or mechanical systems are exempt from the requirements of this section.

**R314.2.3 New attached garages.** A heat detector or heat alarm rated for the ambient outdoor temperatures and humidity shall be installed in new garages that are attached to or located under new and existing dwellings. Heat detectors and heat alarms shall be installed in a central location and in accordance with the manufacturer's instructions.

**EXCEPTION:** Heat detectors and heat alarms shall not be required in dwellings without commercial power.

**R314.3 Location.** Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.
3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.
4. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section R314.3.
5. In napping areas in a family home child care.
6. In the hallway and in the room open to the hallway in dwelling units where the ceiling height of a room open to a hallway serving bedrooms exceeds that of the hallway by 24 inches (610 mm) or more.
7. Within the room to which a loft is open, in the immediate vicinity of the loft.

**R314.4 Interconnection.** Where more than one smoke alarm is required to be installed within an individual *dwelling unit* in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual *dwelling unit*. Where an accessory *dwelling unit* is created within an existing *dwelling unit* all required smoke alarms, in the accessory *dwelling unit* and the primary *dwelling unit*, shall be interconnected in such a manner that the actuation of one alarm will activate all alarms in both the primary *dwelling unit* and the accessory *dwelling unit*. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

**EXCEPTION:** Smoke alarms and alarms installed to satisfy Section R314.4.1 shall not be required to be interconnected to existing smoke alarms where such existing smoke alarms are not interconnected or where such new smoke alarm or alarm is not capable of being interconnected to the existing smoke alarms.

**R314.4.1 Heat detection interconnection.** Heat detectors and heat alarms shall be connected to an alarm or a smoke alarm that is installed in the *dwelling*. Alarms and smoke alarms that are installed for this purpose shall be located in a hallway, room, or other location that will provide occupant notification.

**R314.6 Power source.** Smoke alarms, heat alarms, and heat detectors shall receive their primary power from the building wiring where such wiring is served from a commercial source and, where primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection.

**EXCEPTIONS:**

1. Smoke alarms shall be permitted to be battery operated where installed in buildings without commercial power.
2. Smoke alarms installed in accordance with Section R314.2.2 shall be permitted to be battery powered.

**R315.2 Where required.** Carbon monoxide alarms shall be provided in accordance with Sections R315.2.1 and R315.2.2.

**R315.2.1 New construction.** For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units and on each level of the dwelling in accordance with the manufacturer's recommendation.

**R315.2.2 Alterations, repairs, and additions.** Existing dwellings shall be equipped with carbon monoxide alarms in accordance with Section R315.2.1. An inspection will occur where alterations, repairs, or additions requiring a permit occur, or where one or more sleeping rooms are added or created.

**EXCEPTIONS:**

1. Work involving only the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, is exempt from the inspection requirements of this section.
2. Installation, alteration or repairs of nonfuel burning plumbing or mechanical systems or electrical systems are exempt from the inspection requirements of this section.
3. Owner-occupied single-family residences legally occupied before July 26, 2009. RCW [19.27.530](#) (2)(b).

**R315.3 Location.** Carbon monoxide alarms in dwelling units shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms and on each level of the dwelling and in accordance with the manufacturer's recommendations. Where a fuel burning appliance is located within a bedroom or its attached bathroom, a carbon monoxide alarm shall be installed within the bedroom.



**R324.3 Photovoltaic systems.** Installation, modification, or alteration of solar photovoltaic power systems shall comply with this section and the *International Fire Code*. Section R104.11 alternative materials and methods of this code shall be considered when approving the installation of solar photovoltaic power systems. Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6 and chapter [19.28](#) RCW. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.

**EXCEPTION:** Detached, nonhabitable Group U structures shall not be subject to the requirements of this section for structural and fire safety.

**R324.4 Rooftop-mounted photovoltaic systems.** Rooftop-mounted photovoltaic panel systems installed on or above the roof covering shall be designed and installed in accordance with Section R907.

**EXCEPTION:** The roof structure shall be deemed adequate to support the load of the rooftop solar photovoltaic system if all of the following requirements are met:

1. The solar photovoltaic panel system shall be designed for the wind speed of the local area, and shall be installed per the manufacturer's specifications.
2. The ground snow load does not exceed 70 pounds per square foot.(3.35 kPa)
3. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than 4 pounds per square foot (19.5 kg/m2).
4. Photovoltaic modules are not mounted higher than 18 inches (457 mm) above the surface of the roofing to which they are affixed.
5. Supports for solar modules are to be installed to spread the dead load across as many roof-framing members as needed, so that no point load exceeds 50 pounds (22.7 kg).

**R324.7.1** This section is not adopted.

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**R325.1 General.** Mezzanines shall comply with Sections R325 through R325.5. *Habitable attics* shall comply with Section R326.

||

**R326.1 General.** *Habitable attics* shall comply with Sections R326.1 through R326.4.

**EXCEPTION:** Lofts in dwelling units and sleeping units shall be permitted to comply with Section R333, subject to the limitations in Section R333.1.

||

**R327.1 General.** The design and construction of swimming pools, spas, and other aquatic recreation facilities shall comply with the 2021 *International Swimming Pool and Spa Code*, if the facility is one of the following:

1. For the sole use of residents and invited guests at a single-family dwelling;
2. For the sole use of residents and invited guests of a duplex owned by the residents; or
3. Operated exclusively for physical therapy or rehabilitation and under the supervision of a licensed medical practitioner.

**R328.2 Equipment listings.** ESS shall be *listed* and *labeled* for residential use in accordance with UL 9540.

**EXCEPTIONS:**

1. Where approved, repurposed unlisted battery systems from electric vehicles are allowed to be installed outdoors or in detached sheds located not less than 5 feet (1524 mm) from exterior walls, property lines, and public ways.
2. Battery systems that are an integral part of an electric vehicle are allowed provided that the installation complies with Section 625.48 of NFPA 70.
3. Battery systems less than 1 kWh (3.6 megajoules).

**R328.12 Commissioning.** ESS shall be commissioned as follows:

1. Verify that the system is installed in accordance with the approved plans and manufacturer's instructions and is operating properly.
2. Provide a copy of the manufacturer's installation, operation, maintenance, and decommissioning instructions provided with the *listed* system.
3. Provide a label on the installed system containing the contact information for the qualified maintenance and service providers.

**R328.12.1 Installation prior to closing.** Where the system is installed in a one- or two-family dwelling or townhouse unit that is owned by the builder and has yet to be sold, commissioning shall be conducted as outlined in Section R328.12, and the builder shall then transfer the required information in Section R328.12 to the homeowner when the property is transferred to the owner at the closing.

**R330.1 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.

**R330.2 Reserved.**

**R330.3 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 Section R330.9 is provided.
3. Type NS2 – Where two means of egress are at grade level or ramps constructed in accordance with Section R330.9 are provided.

**R330.4 Types of locking devices and door activation.** 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. Pocket doors shall have graspable hardware available when in the closed or open position. The force required to activate operable parts shall be 5.0 pounds (22.2 N) maximum. Required exit doors shall have no additional locking devices. Required exit door hardware shall unlock inside and outside mechanisms when exiting the building allowing reentry into the adult family home without the use of a key, tool or special knowledge.

**R330.5 Smoke and carbon monoxide alarm requirements.** All adult family homes shall be equipped with smoke and carbon monoxide alarms installed as required in Sections R314 and R315.1. Alarms shall be installed in such a manner so that the detection device warning is audible from all areas of the dwelling upon activation of a single alarm.

**R330.6 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.

**R330.7 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.

**R330.8 Grab bar general requirements.** Where facilities are designated for use by adult family home clients, grab bars for water closets, bathtubs, and shower stalls shall be installed according to this section.

**R330.8.1 Grab bar cross section.** Grab bars with a circular cross section shall have an outside diameter of 1 1/4 inch (32 mm) minimum and 2 inches (50 mm) maximum. Grab bars with noncircular cross section shall have a cross section dimension of 2 inches (50mm) maximum and a perimeter dimension of 4 inches (102 mm) minimum and 4 5/8 inches maximum.

**R330.8.2 Grab bar installation.** Grab bars shall have a spacing of 1 1/2 inch (32 mm) between the wall and the bar. Projecting objects, control valves and bathtub or shower stall enclosure features above, below and at the ends of the grab bar shall have a clear space of 1 1/2 inch (32 mm) to the grab bar.

**EXCEPTION:** Swing-up grab bars shall not be required to meet the 1 1/2 inch (32 mm) spacing requirement.

Grab bars shall have a structural strength of 250 pounds applied at any point on the grab bar, fastener, mounting device or supporting structural member. Grab bars shall not be supported directly by any residential grade fiberglass bathing or showering unit. Acrylic bars found in bathing units shall be removed. Fixed position grab bars, when mounted, shall not rotate, spin or move and have a graspable surface finish.

**R330.8.3 Grab bars at water closets.** Water closets shall have grab bars mounted on both sides. Grab bars can be a combination of fixed position and swing-up bars. Grab bars shall meet the requirements of Section R330.8. Grab bars shall mount between 33 inches (838 mm) and 36 inches (914 mm) above floor grade. Centerline distance between grab bars, regardless of type used, shall be between 25 inches (635 mm) minimum and 30 inches (762 mm) maximum.

**R330.8.3.1 Fixed position grab bars.** Fixed position grab bars shall be a minimum of 36 inches (914 mm) in length and start 12 inches (305 mm) from the rear wall.

**R330.8.3.2 Swing-up grab bars.** Swing-up grab bars shall be a minimum of 28 inches (711 mm) in length from the rear wall.

**R330.8.4 Grab bars at bathtubs.** Horizontal and vertical grab bars shall meet the requirements of Section R330.8.

**R330.8.4.1 Vertical grab bars.** Vertical grab bars shall be a minimum of 18 inches (457 mm) long and installed at the control end wall and head end wall. Grab bars shall mount within 4 inches (102 mm) of the exterior of the bathtub edge or within 4 inches (102 mm) within the bathtub. The bottom end of the bar shall start between 36 inches (914 mm) and 42 inches (1067 mm) above floor grade.

**EXCEPTION:** The required vertical grab bar can be substituted with a floor to ceiling grab bar meeting the requirements of Section R325.8 at the control end and head end entry points.

**R330.8.4.2 Horizontal grab bars.** Horizontal grab bars shall be provided at the control end, head end, and the back wall within the bathtub area. Grab bars shall be mounted between 33 inches (838 mm) and 36 inches (914 mm) above floor grade. Control end and head end grab bars shall be 24 inches (610 mm) minimum in length. Back wall grab bar shall be 36 inches (914 mm) minimum in length.

**R330.8.5 Grab bars at shower stalls.** Where shower stalls are provided to meet the requirements for bathing facilities, grab bars shall meet the requirements of Section R330.8.

**EXCEPTION:** Shower stalls with permanent built-in seats are not required to have vertical or horizontal grab bars at the seat end wall. A vertical floor to ceiling grab bar shall be installed within 4 inches of the exterior of the shower aligned with the nose of the built-in seat.

**R330.8.5.1 Vertical grab bars.** Vertical grab bars shall be 18 inches (457 mm) minimum in length and installed at the control end wall and head end wall. Vertical bars shall be mounted within 4 inches (102 mm) of the exterior of the shower stall or within 4 inches (102 mm) inside the shower stall. The bottom end of vertical bars mount between 36 inches (914 mm) and 42 inches (1067 mm) above floor grade.

**R330.8.5.2 Horizontal grab bars.** Horizontal grab bars shall be installed on all sides of the shower stall mounted between 33 inches (838 mm) and 36 inches (914 mm) above the floor grade. Horizontal grab bars shall be a maximum of 6 inches (152 mm) from adjacent walls. Horizontal grab bars shall not interfere with shower control valves.

**R330.9 Ramps.** All interior and exterior ramps, when provided, shall be constructed in accordance with Section R311.8 with a maximum slope of 1 vertical to 12 horizontal. The exception to Section R311.8.1 is not allowed for adult family homes. Handrails shall be installed in accordance with Section R330.9.1.

**R330.9.1 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 Sections R311.8.3.1 through R311.8.3.3.

**R330.10 Stair treads and risers.** Stair treads and risers shall be constructed in accordance with Section R311.7.5. Handrails shall be installed in accordance with Section R330.10.1.

**R330.10.1 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 Sections R311.7.8.1 through R311.7.8.4.

**R330.11 Shower stalls.** Where provided to meet the requirements for bathing facilities, the minimum size of shower stalls for an adult family home shall be 30 inches (762 mm) deep by 48 inches (1219 mm) long.

**R331.1 Family home child care.** For family home child care with more than six children, each floor level used for family child care purposes shall be served by two remote means of egress. Exterior exit doors shall be operable from the inside without the use of keys or any special knowledge or effort. Basements located more than 4 feet below grade level shall not be used for family home child care unless one of following conditions exist:

1. Stairways from the basement open directly to the exterior of the building without entering the first floor;
2. One of the two required means of egress discharges directly to the exterior from the basement level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor above;
3. One of the two required means of egress is an operable window or door, approved for emergency escape or rescue, that opens directly to a public street, public alley, yard or exit court; or
4. A residential sprinkler system is provided throughout the entire building in accordance with NFPA 13d.

Floors located more than 4 feet above grade level shall not be occupied by children in family home child care.

- EXCEPTIONS:**
1. Use of toilet facilities while under supervision of an adult staff person;
  2. Family home child care may be allowed on the second story if one of the following conditions exists:
    - 2.1. Stairways from the second story open directly to the exterior of the building without entering the first floor;
    - 2.2. One of the two required means of egress discharges directly to the exterior from the second story level, and a self-closing door is installed at the top or bottom of the interior stair leading to the floor below; or
    - 2.3. A residential sprinkler system is provided throughout the entire building in accordance with NFPA 13d.

Every sleeping or napping room in a family home child care shall have at least one operable window for emergency rescue.

**EXCEPTION:** Sleeping or napping rooms having doors leading to two separate means of egress, or a door leading directly to the exterior of the building.

Rooms or spaces containing a commercial-type cooking kitchen, boiler, maintenance shop, janitor closet, laundry, woodworking shop, flammable or combustible storage, or painting operation shall be separated from the family home child care area by at least 1-hour fire-resistant construction.

**EXCEPTION:** A fire-resistant separation shall not be required where the food preparation kitchen contains only a domestic cooking range, and the preparation of food does not result in the production of smoke or grease laden vapors.

**Insert Page 3-67 #3**

**Insert Facing Insert Page 3-67 #4**

**R332.1 Protection against radon.** The radon control provisions of Appendix F of this code shall apply to buildings constructed in high radon potential counties (zone 1) designated in Table AF101(1). The radon control provisions of Appendix F of this code shall also apply to all buildings constructed using the provisions of Section R408.3 Unvented crawl space compliance method.

**R333.1 General.** Where provided in dwelling units or sleeping units, lofts shall comply with this code as modified by Sections R333.1 through R333.5. Lofts constructed in compliance with this section shall be considered a portion of the story below. Such lofts shall not contribute to the number of stories as regulated by this code.

**EXCEPTION:** Lofts need not comply with Section R333 where they meet any of the following conditions:

1. The loft has a maximum depth of less than 3 feet (914 mm).
2. The loft has a floor area of less than 35 square feet (3.3 m<sup>2</sup>).
3. The loft is not provided with a permanent means of egress.

**R333.2 Loft limitations.** Lofts shall comply with the following conditions:

1. The loft floor area shall be less than 70 square feet (6.5 m<sup>2</sup>).
2. The loft ceiling height shall not exceed 7 feet (2134 mm) for more than one half of the loft floor area.

The provisions of Sections R333.3 through R333.5 shall not apply to lofts that do not comply with Items 1 and 2 of this section.

**R333.3 Loft ceiling height.** The ceiling height below a loft shall not be less than 7 feet (2134 mm). The ceiling height above the finished floor of the loft shall not be less than 3 feet (914 mm). Portions of the loft with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not contribute to the loft floor area.

**R333.4 Loft area.** The aggregate area of all lofts and mezzanines within a room shall comply with Section R325.3.

**EXCEPTION:** The area of a single loft located within a dwelling unit or sleeping unit equipped with an automatic sprinkler system in accordance with Section P2904 shall not be greater than two-thirds of the area of the room in which it is located, provided that no other lofts or mezzanines are open to the room in which the loft is located.

**R333.5 Permanent egress for lofts.** Where a permanent means of egress is provided for lofts, the means of egress shall comply with Section R311 as modified by Section R333.5.1.

**R333.5.1 Ceiling height at loft means of egress.** A minimum ceiling height of 3 feet (914 mm) shall be provided for the entire width of the means of egress from the loft.

**R334.1 General.** Stationary fuel cell power systems in new and existing buildings and structures shall comply with Section 1206 of the *International Fire Code*.

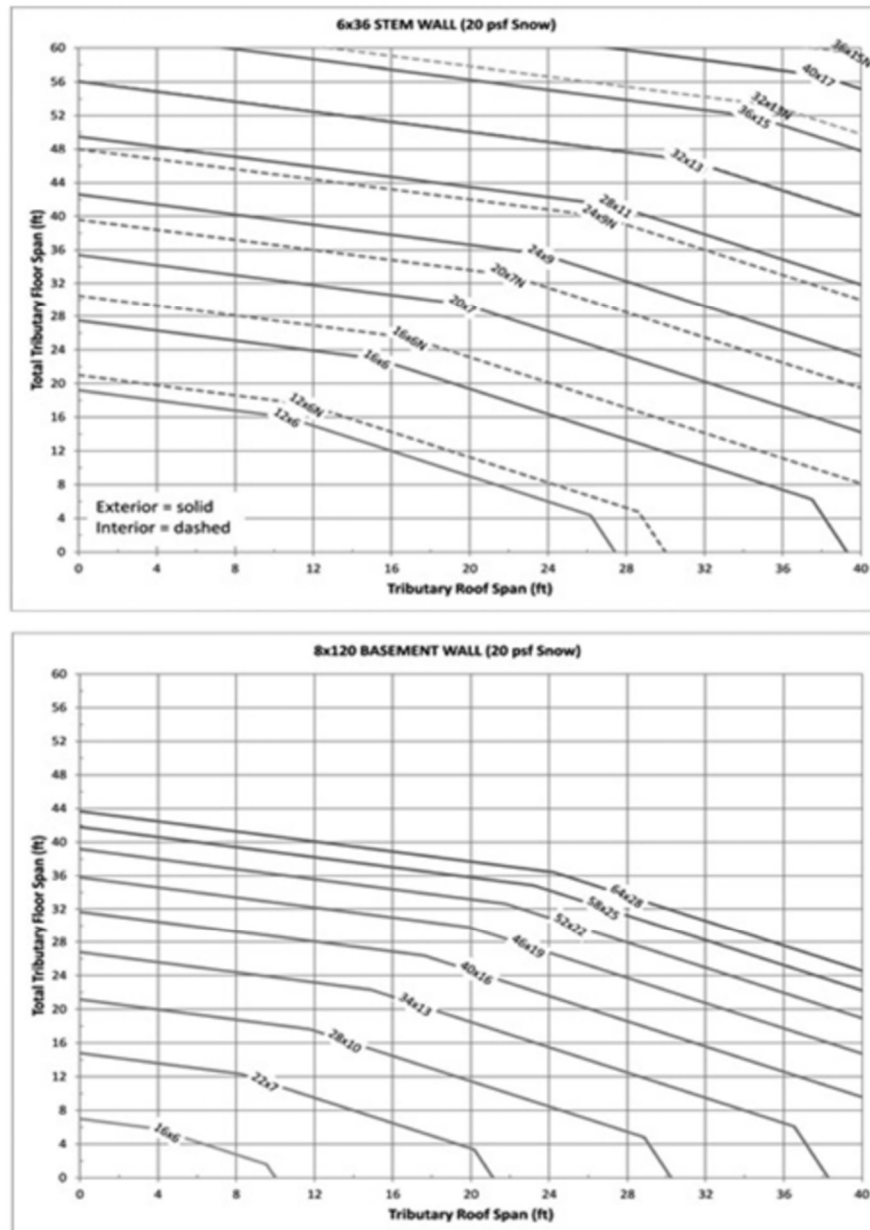
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**R403.1.1 Minimum size.** The minimum width, W, and thickness, T, for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable, but not less than 12 inches (305 mm) in width and 6 inches (152 mm) in depth. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P, shall be not less than 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3). Footings for precast foundation shall be in accordance with the details set forth in Section R403.4, Table R403.4, and Figures R403.4(1) and R403.4(2).

**EXCEPTION:** Light-frame construction shall be permitted to have minimum footing size in accordance with Figures 403.1.1(1) through R403.1.1(4) in lieu of that determined by Table R403.1(1). ||

**Figure R403.1.1(1)**  
**Alternative Minimum Footing Size for Light-Frame Construction** a, b, c, d, e, f, g, h, i  
 20 PSF Snow Load

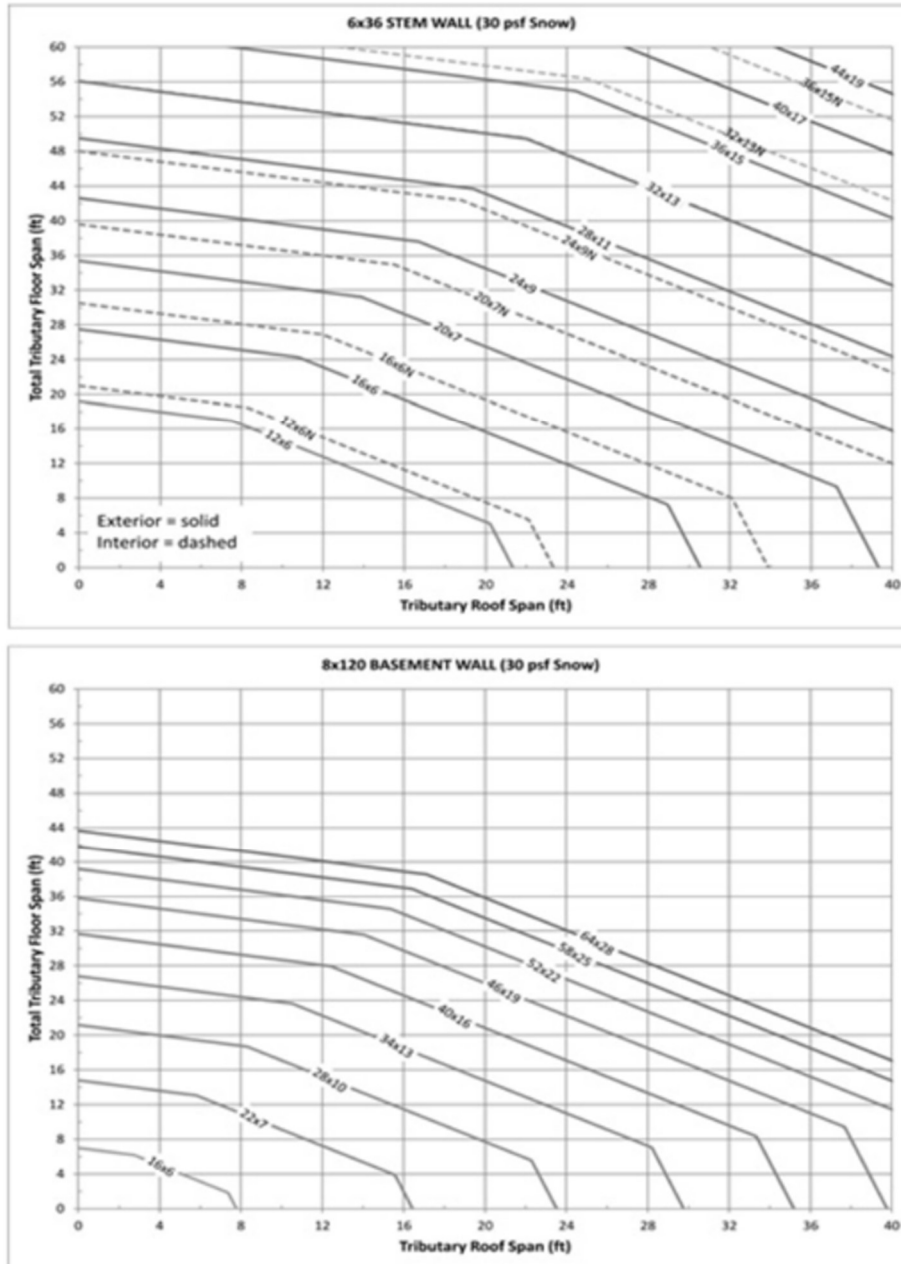


- a. The minimum footing size is based on the following assumptions: Material weights per Section R301.2.2.2.1 and soil density = 120 pcf. Wood framed walls = 10 foot; crawlspace stem wall = 6 inches x 36 inches; basement wall = 8 inches x 120 inches. Total load (TL) equal to the maximum of three load combinations:  $LC1=D+L$ ,  $LC2=D+S$  and  $LC3=D+0.75(L+S)$ , where D=dead load, L=live load, S=snow load.  $TL=\max(LC1, LC2, LC3)$ .
- b. Use tributary span of floor and roof. Figure may be used to size exterior and interior footings.
- c. Add 4 feet to tributary floor span for each wood framed wall above first level (i.e., 4 feet for 2-story, 8 feet for 3-story).
- d. Multiply floor span by 1.25 for interior footings supporting continuous joists.
- e. Multiply footing width by (1500 psf/capacity) for soil capacity other than 1500 psf. See Section R403.1.1 for thickness.
- f. Dashed line may be used for interior footing size only.
- g. Use footing size indicated on line above the span combination used.
- h. For span combinations above the upper line, a design professional is required.
- i. Interpolation between footing sizes is allowed. Extrapolation is not allowed.

**Insert Page 4-8 #2**

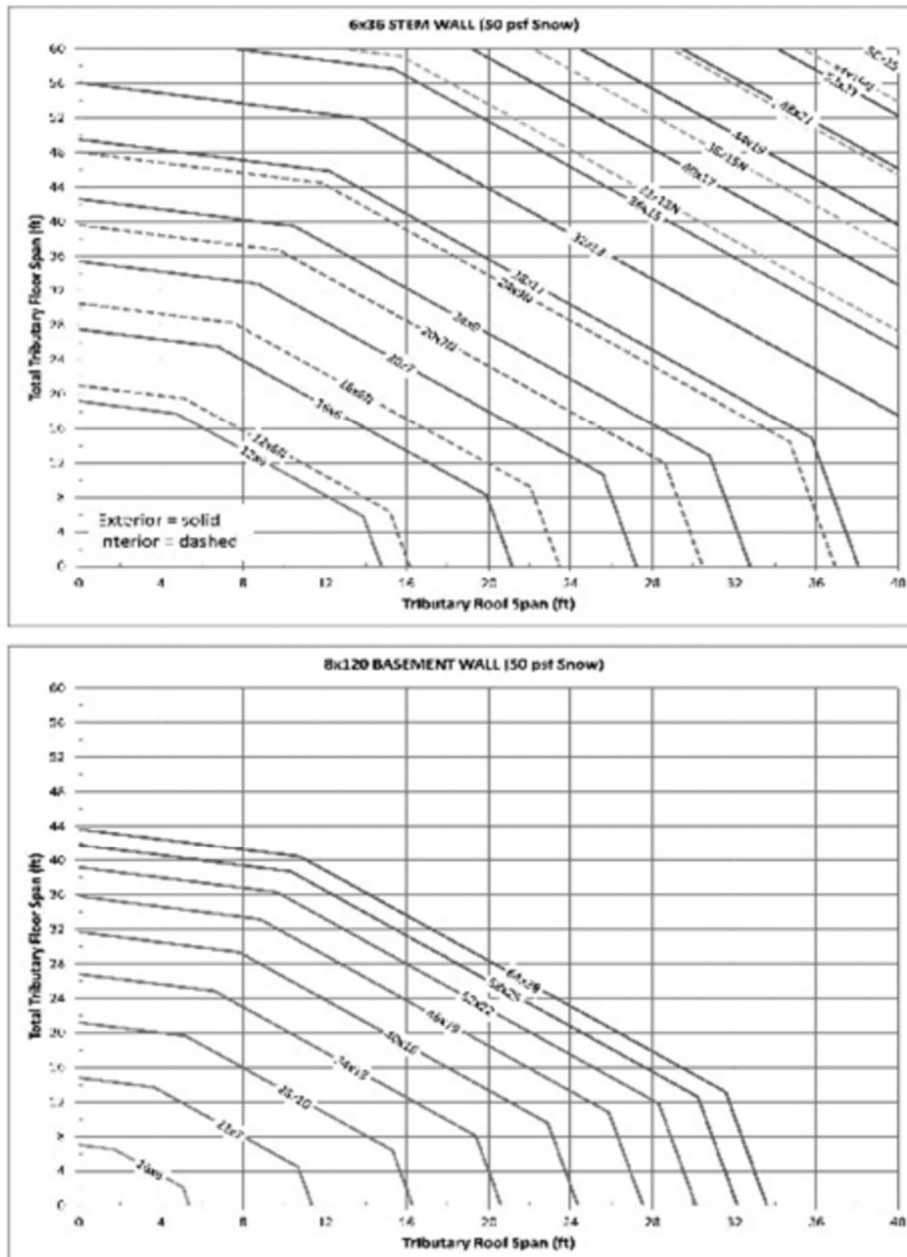
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**Figure R403.1.1(2)**  
**Alternative Minimum Footing Size for Light-Frame Construction** a, b, c, d, e, f, g, h, i  
 30 PSF Snow Load

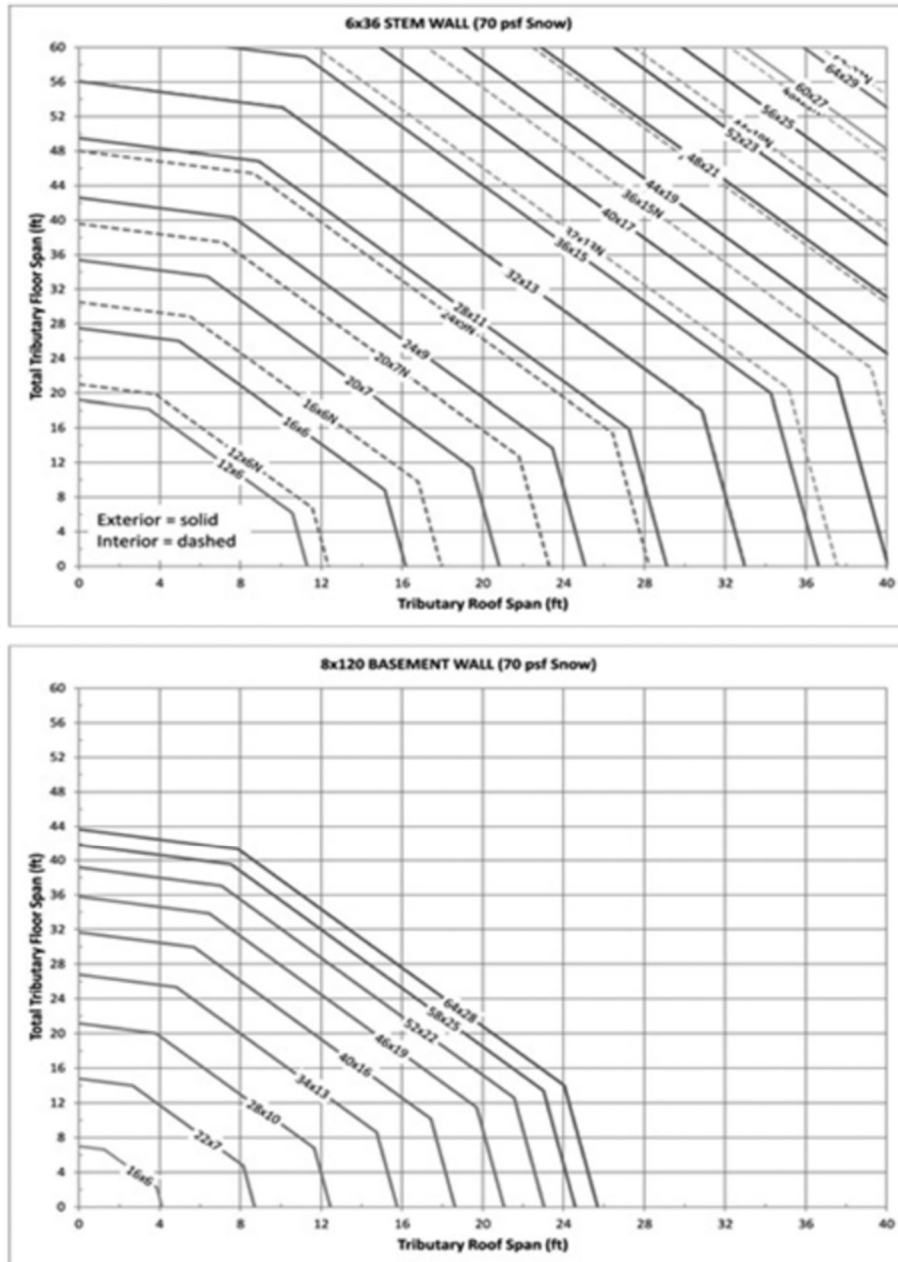


- a. The minimum footing size is based on the following assumptions: Material weights per Section R301.2.2.2.1 and soil density = 120 pcf. Wood framed walls = 10 foot; crawlspace stem wall = 6 inches × 36 inches; basement wall = 8 inches × 120 inches. Total load (TL) equal to the maximum of three load combinations:  $LC1=D+L$ ,  $LC2=D+S$  and  $LC3=D+0.75(L+S)$ , where D=dead load, L=live load, S=snow load.  $TL=\max(LC1, LC2, LC3)$ .
- b. Use tributary span of floor and roof. Figure may be used to size exterior and interior footings.
- c. Add 4 feet to tributary floor span for each wood framed wall above first level (i.e., 4 feet for 2-story, 8 feet for 3-story).
- d. Multiply floor span by 1.25 for interior footings supporting continuous joists.
- e. Multiply footing width by (1500 psf/capacity) for soil capacity other than 1500 psf. See Section R403.1.1 for thickness.
- f. Dashed line may be used for interior footing size only.
- g. Use footing size indicated on line above the span combination used.
- h. For span combinations above the upper line, a design professional is required.
- i. Interpolation between footing sizes is allowed. Extrapolation is not allowed.

**Figure R403.1.1(3)**  
**Alternative Minimum Footing Size for Light-Frame Construction** a, b, c, d, e, f, g, h, i  
 50 PSF Snow Load



**Figure R403.1.1(4)**  
**Alternative Minimum Footing Size for Light-Frame Construction** a, b, c, d, e, f, g, h, i  
 70 PSF Snow Load



- a. The minimum footing size is based on the following assumptions: Material weights per Section R301.2.2.2.1 and soil density = 120 pcf. Wood framed walls = 10 foot; crawlspace stem wall = 6 inches x 36 inches; basement wall = 8 inches x 120 inches. Total load (TL) equal to the maximum of three load combinations:  $LC1=D+L$ ,  $LC2=D+S$  and  $LC3=D+0.75(L+S)$ , where D=dead load, L=live load, S=snow load.  $TL=\max(LC1, LC2, LC3)$ .
- b. Use tributary span of floor and roof. Figure may be used to size exterior and interior footings.
- c. Add 4 feet to tributary floor span for each wood framed wall above first level (i.e., 4 feet for 2-story, 8 feet for 3-story).
- d. Multiply floor span by 1.25 for interior footings supporting continuous joists.
- e. Multiply footing width by (1500 psf/capacity) for soil capacity other than 1500 psf. See Section R403.1.1 for thickness.
- f. Dashed line may be used for interior footing size only.
- g. Use footing size indicated on line above the span combination used.
- h. For span combinations above the upper line, a design professional is required.
- i. Interpolation between footing sizes is allowed. Extrapolation is not allowed.

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**R408.1 Ventilation.** The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a basement) shall have ventilation openings through foundation walls or exterior walls. 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 6 inches (152 mm) 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 2 inches (51 mm).

**R408.2 Openings for under-floor ventilation.** The minimum net area of ventilation openings shall not be less than 1 square foot (0.0929 m<sup>2</sup>) for each 300 square feet (28 m<sup>2</sup>) of under-floor area. Required openings shall be evenly placed to provide cross ventilation of the space except one side of the building shall be permitted to have no ventilation openings. Ventilation openings shall be covered for their height and width with any of the following materials provided that the least dimension of the covering shall not exceed 1/4 inch (6.4 mm), and operational louvers are permitted:

1. Perforated sheet metal plates not less than 0.070 inch (1.8 mm) thick.
2. Expanded sheet metal plates not less than 0.047 inch (1.2 mm) thick.
3. Cast-iron grill or grating.
4. Extruded load-bearing brick vents.
5. Hardware cloth of 0.035 inch (0.89 mm) wire or heavier.
6. Corrosion-resistant wire mesh, with the least dimension being 1/8 inch (3.2 mm).

**EXCEPTION:** The total area of ventilation openings shall be permitted to be reduced to 1/1,500 of the under-floor area where the ground surface is covered with an approved Class I vapor retarder material and the required openings are placed to provide cross ventilation of the space. The installation of operable louvers shall not be prohibited. If the installed ventilation is less than 1/300, or if operable louvers are installed, a radon vent shall be installed to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with the requirements of Appendix AF (Radon) of this code.

**R408.3 Unvented crawl space.** Ventilation openings in under-floor spaces specified in Section R408.2 shall not be required where:

1. Exposed earth is covered with a continuous Class I vapor retarder. Joints of the vapor retarder shall overlap by 6 inches (152 mm) and shall be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (152 mm) up the stem wall and shall be attached and sealed to the stem wall; and a radon system shall be installed that meets the requirements of Appendix AF (Radon) of this code.
2. Continuously operated mechanical exhaust ventilation is provided at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m<sup>2</sup>) of crawlspace floor area. Exhaust ventilation shall terminate to the exterior.

**EXCEPTION:** Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum.

**R408.8 Under-floor vapor retarder.** This section is not adopted.

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**TABLE R507.3.1  
MINIMUM FOOTING SIZE FOR DECKS**

LIVE OR GROUND SNOW LOAD (psf)	TRIBUTARY AREA (sq.ft.)	LOAD-BEARING VALUE OF SOILS <sup>a, c, d</sup> (psf)								
		1500 <sup>e</sup>			2000 <sup>e</sup>			≥ 3000 <sup>e</sup>		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness <sup>f</sup> (inches)
60 Live or 70 Ground Snow Load	5	7	8	6	7	8	6	7	8	6
	20	12	14	6	11	13	6	9	10	6
	40	18	20	6	15	17	6	12	14	6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 pound per square foot = 0.0479 kPa.

**a.** Interpolation permitted, extrapolation not permitted.

**b.** Reserved.

**c.** Footing dimensions shall allow complete bearing of the post.

**d.** If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.

**e.** Area, in square feet, of deck surface supported by post and footings.

**f.** Minimum thickness shall only apply to plain concrete footings,

**R507.4 Deck posts.** For single-level decks, wood post size shall be in accordance with Table R507.4.

**TABLE R507.4  
DECK POST HEIGHT**

LOADS <sup>b</sup> (psf)	POST SPECIES <sup>c</sup>	POST SIZE <sup>d</sup>	TRIBUTARY AREA <sup>g,h</sup> (sq. ft.)							
			20	40	60	80	100	120	140	160
			MAXIMUM DECK POST HEIGHT <sup>a</sup> (feet-inches)							
60 Live Load, ≤60 Ground Snow Load	Douglas Fire <sup>e</sup> , Hem-fire <sup>e</sup> , SPF <sup>e</sup>	4 x 4	14-0	10-10	8-7	7-0	5-8	4-1	NP	NP
		4 x 6	14-0	13-10	11-1	9-5	8-2	7-3	6-4	5-4
		6 x 6	14-0	14-0	14-0	14-0	14-0	13-3	10-9	6-11
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	4 x 4	14-0	10-3	7-0	NP	NP	NP	NP	NP
		4 x 6	14-0	13-6	10-6	8-4	5-10	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	11-11	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
70 Ground Snow Load	Douglas Fire <sup>e</sup> , Hem-fire <sup>e</sup> , SPF <sup>e</sup>	4 x 4	14-0	10-1	7-11	6-6	5-3	3-7	NP	NP
		4 x 6	14-0	12-10	10-3	8-9	7-7	6-8	5-10	4-11
		6 x 6	14-0	14-0	14-0	14-0	14-0	12-2	9-9	5-9
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	4 x 4	14-0	9-5	6-5	NP	NP	NP	NP	NP
		4 x 6	14-0	12-6	9-8	7-7	5-3	NP	NP	NP
		6 x 6	14-0	14-0	14-0	14-0	10-8	NP	NP	NP
		8 x 8	14-0	14-0	14-0	14-0	14-0	14-0	14-0	14-0

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 square foot = 0.0929 m<sup>2</sup>, 1 pound per square foot = 0.0479 kPa, NP = Not permitted.

**a.** Measured from the underside of the beam to top of footing or pier.

**b.** 10 psf dead load. Snow load not assumed to be concurrent with live load.

**c.** No. 2 grade, wet service factor included.

**d.** Notched deck posts shall be sized to accommodate beam size in accordance with Section 507.5.2.

**e.** Includes incising factor.

**f.** Incising factor not included.

**g.** Area, in square feet, of deck surface supported by post and footing.

**h.** Interpolation permitted. Extrapolation not permitted.

**R507.5 Deck beams.** Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Table R507.5. Beam plies shall be fastened together with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the actual beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

**R507.6 Deck joists.** Maximum allowable spans for wood deck joists, as shown in Figure R507.6, shall be in accordance with Table R507.6. The maximum joist spacing shall be limited by the decking materials in accordance with Table R507.7.

**R507.9.1.2 Band joist details.** Band joists supporting a ledger shall be a minimum 2-inch-nominal (51 mm), solid-sawn, spruce-pine-fir or better lumber or minimum 1-inch (25 mm) nominal engineered wood rim boards in accordance with Section R502.1.7. Band joists shall bear fully on the primary structure capable of supporting all required loads.

Tables R507.5(1) through R507.5(4) are not adopted.

**TABLE R507.5**  
**MAXIMUM DECK BEAM SPAN - 60 PSF LIVE LOAD or**  
**70 PSF GROUND SNOW LOAD <sup>c</sup>**

BEAM SPECIES <sup>d</sup>	BEAM SIZE <sup>e</sup>	EFFECTIVE DECK JOIST SPAN LENGTH <sup>a, j</sup> (feet)						
		6	8	10	12	14	16	18
		MAXIMUM DECK BEAM SPAN LENGTH <sup>a, b, f</sup> (feet-inches)						
Douglas fir-larch <sup>g</sup> , Hem-fir <sup>g</sup> , Spruce-pine-fir <sup>g</sup>	1-2×6	3-5	2-10	2-5	2-2	2-0	1-10	1-9
	1-2×8	4-7	3-8	3-2	2-10	2-7	2-5	2-4
	1-2×10	5-8	4-9	4-1	3-8	3-4	3-1	2-11
	1-2×12	6-7	5-8	5-0	4-6	4-1	3-10	3-7
	2-2×6	5-2	4-6	4-0	3-5	3-1	2-10	2-7
	2-2×8	6-11	6-0	5-3	4-7	4-1	3-8	3-5
	2-2×10	8-5	7-4	6-6	5-10	5-2	4-9	4-5
	2-2×12	9-10	8-6	7-7	6-11	6-4	5-9	5-4
	3-2×6	6-6	5-7	5-0	4-7	4-2	3-9	3-5
	3-2×8	8-8	7-6	6-8	6-1	5-6	5-0	4-7
	3-2×10	10-7	9-2	8-2	7-6	6-11	6-4	5-10
	3-2×12	12-4	10-8	9-7	8-9	8-1	7-7	7-1
Redwood <sup>h</sup> , Western Cedars <sup>h</sup> , Ponderosa Pine <sup>h</sup> , Red Pine <sup>h</sup>	1-2×6	3-6	2-11	2-6	2-3	2-0	1-11	1-9
	1-2×8	4-6	3-10	3-3	2-11	2-8	2-6	2-4
	1-2×10	5-6	4-9	4-2	3-9	3-5	3-2	3-0
	1-2×12	6-4	5-6	4-11	4-6	4-2	3-11	3-8
	2-2×6	5-3	4-7	4-1	3-6	3-2	2-11	2-8
	2-2×8	6-8	5-9	5-2	4-8	4-2	3-10	3-6
	2-2×10	8-2	7-1	6-4	5-9	5-4	4-10	4-6
	2-2×12	9-5	8-2	7-4	6-8	6-2	5-9	5-5
	3-2×6	6-4	5-8	5-1	4-8	4-3	3-10	3-6
	3-2×8	8-4	7-3	6-5	5-11	5-5	5-1	4-8
	3-2×10	10-2	8-10	7-11	7-2	6-8	6-3	5-11
	3-2×12	11-10	10-3	9-2	8-4	7-9	7-3	6-10

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg.

**a.** Interpolation allowed. Extrapolation is not allowed.

**b.** Beams supporting a single span of joists with or without cantilever.

**c.** Dead load = 10 psf, L/Δ = 360 at mainspan, L/Δ = 180 at cantilever. Snow load not assumed to be concurrent with live load.

**d.** No. 2 grade, wet service factor included.

**e.** Beam depth shall be equal to or greater than the depth of intersecting joist for a flush beam connection.

**f.** Beam cantilevers are limited to the adjacent beam's span divided by 4.

**g.** Includes incising factor.

**h.** Incising factor not included.

**i.** Deck joist span as shown in Figure R507.6.

**j.** For calculation of effective joist span, the actual joist span length shall be multiplied by the joist span factor in accordance with Table R507.5(5).

**TABLE R507.6  
MAXIMUM DECK JOIST SPANS**

LOAD <sup>a</sup> (psf)	JOIST SPECIES <sup>b</sup>	JOIST SIZE	ALLOWABLE JOIST SPAN <sup>b, c</sup> (feet-inches)			MAXIMUM CANTILEVER <sup>d, f</sup> (feet-inches)							
			Joist Spacing (inches)			Adjacent Joist Back Span <sup>g</sup> (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Live Load or 70 Ground Snow Load	Douglas fir-larch <sup>e</sup> , Hem-fir <sup>e</sup> , Spruce-pine-fir <sup>e</sup>	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood <sup>f</sup> , Western Cedars <sup>f</sup> , Ponderosa Pine <sup>f</sup> , Red Pine <sup>f</sup>	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa, 1 pound = 0.454 kg, NP = Not permitted.

**a.** Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.

**b.** No. 2 grade, wet service factor included.

**c.** L/Δ = 360 at main span.

**d.** L/Δ = 180 at cantilever with 220-pound point load applied to end.

**e.** Includes incising factor.

**f.** Incising factor not included.

**g.** Interpolation permitted. Extrapolation not permitted.

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**TABLE R507.9.1.3(1)**  
**DECK LEDGER CONNECTION TO BAND JOIST**

<b>LOAD <sup>c</sup> (psf)</b>	<b>JOIST SPAN <sup>a</sup> (feet)</b>	<b>On-CENTER SPACING OF FASTENERS <sup>b</sup> (inches)</b>		
		<b>1/2-inch diameter lag screw with 1/2-inch maximum sheathing <sup>d, e</sup></b>	<b>1/2-inch diameter bolt with 1/2-inch maximum sheathing <sup>e</sup></b>	<b>1/2-inch diameter bolt with 1-inch maximum sheathing <sup>f</sup></b>
60 Live Load or 70 Ground Snow Load	6	22	36	35
	8	16	31	26
	10	13	25	21
	12	11	20	17
	14	9	17	15
	16	8	15	13
	18	7	13	11

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square foot = 0.0479 kPa.

**a.** Interpolation permitted. Extrapolation is not permitted.

**b.** Ledgers shall be flashed in accordance with Section R703.4 to prevent water from contacting the house band joist.

**c.** Dead load = 10 psf. Snow load shall not be assumed to act concurrently with live load.

**d.** The tip of the lag screw shall fully extend beyond the inside face of the band joist.

**e.** Sheathing shall be wood structural panel or solid sawn lumber.

**f.** Sheathing shall be permitted to be wood structural panel, gypsum board, fiberboard, lumber or foam sheathing. Up to 1/2-inch thickness of stacked washers shall be permitted to substitute for up to 1/2 inch of allowable sheathing thickness where combined with wood structural panel or lumber sheathing.

**TABLE R507.9.1.3(2)**  
**PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS**

<b>MINIMUM END AND EDGE DISTANCES AND SPACING BETWEEN ROWS</b>				
	<b>TOP EDGE</b>	<b>BOTTOM EDGE</b>	<b>ENDS</b>	<b>ROW SPACING</b>
Ledger <sup>a</sup>	2 inches <sup>d</sup>	3/4 inch	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>
Band joist <sup>c</sup>	3/4 inch	2 inches <sup>e</sup>	2 inches <sup>b</sup>	1 5/8 inches <sup>b</sup>

For SI: 1 inch = 25.4 mm.

**a.** Lag screws or bolts shall be staggered from the top to the bottom along the horizontal run of the deck ledger in accordance with Figure R507.9.1.3(1).

**b.** Maximum 5 inches.

**c.** For engineered rim joists, the manufacturer's recommendations shall govern.

**d.** The minimum distance from bottom row of lag screws to the top edge of the ledger shall be in accordance with Figure R507.9.1.3(1).

**e.** The 2 inches may be reduced to 3/4 inch when the band joist is directly supported by a mudsill, a header or by double top wall plates.

**R507.9.2 Deck lateral load connections.** Lateral loads shall be transferred to the ground or to a structure capable of transmitting them to the ground. Where the lateral load connection is provided in accordance with Figure R507.9.2(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.9.2(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).

**EXCEPTION:** Decks not more than 30 inches above grade at any point may be unattached.

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**R602.1.1.1 Used sawn lumber.** Used sawn lumber identified with a grade mark, in good condition and devoid of areas of decay shall be assumed to meet the requirements of Section 602.1.1 or shall comply with the following:

**1.** Dimensional lumber not identified with a grade mark that has a nominal thickness of 2 inches with a nominal width of 6 inches, or less, shall be assumed to be spruce-pine-fir stud grade and shall have structural properties assigned in accordance with current adopted standards. All other dimensional lumber shall be assumed to be hem-fir No. 2 grade and shall have structural properties assigned in accordance with current adopted standards.

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**R602.9 Cripple walls.** Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 with a stud height less than 14 inches (356 mm) shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. All cripple walls shall be supported on continuous footings or foundations.

**EXCEPTION:** Footings supporting cripple walls used to support interior braced wall panels as required in Sections R403.1.2 and R602.10.9.1 shall be continuous for the required length of the cripple wall and constructed beyond the cripple wall for a minimum distance of 4 inches and a maximum distance of the footing thickness. The footings extension is not required at intersections with other footings.



**R602.10.10 Cripple wall bracing.** Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls supporting bearing walls or exterior walls or interior braced wall panels as required in Section R403.1.2 shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3), and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4), respectively, except the length of the cripple wall bracing shall be multiplied by a factor of 1.15. Where gypsum wall board is not used on the inside of the cripple wall bracing, the length adjustments for the elimination of the gypsum wallboard, or equivalent, shall be applied as directed in Tables R602.10.3(2) and R602.10.3(4) to the length of cripple wall bracing required. This adjustment shall be taken in addition to the 1.15 increase.

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**R609.3 Testing and labeling.** Exterior windows and sliding doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicate compliance with AAMA/WDMA/CSA 101/I.S.2/A440. Exterior side-hinged doors shall be tested and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or AMD 100, or comply with Section R609.5.

**EXCEPTIONS:**

1. Decorative glazed openings.
2. Custom exterior windows and doors manufactured by a small business shall be exempt from all testing requirements in Section R609 provided they meet the applicable provisions of Chapter 24 of the International Building Code.



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**R702.5 Other finishes.** Wood veneer paneling and hardboard paneling shall be placed on wood or cold-formed steel framing spaced not more than 16 inches (406 mm) on center. Wood veneer and hardboard paneling less than 1/4-inch (6 mm) nominal thickness shall not have less than a 3/8-inch (10 mm) gypsum board or gypsum panel product backer. Wood veneer paneling not less than 1/4-inch (6 mm) nominal thickness shall conform to ANSI/HPVA HP-1. Hardboard paneling shall conform to CPA/ANSI A135.5. All structural panel components within the conditioned space such as plywood, particle board, wafer board and oriented strand board shall be identified as "EXPOSURE 1," "EXTERIOR" or "HUD-APPROVED."

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**R703.1.1 Water resistance.** The exterior wall envelope shall be designed and constructed in a manner that prevents the accumulation of water within the wall assembly by providing a water-resistant barrier behind the exterior veneer as required by Section R703.2 and a means of draining water that enters the assembly to the exterior. Protection against condensation in the exterior wall assembly shall be provided in accordance with Section R702.7 of this code.

**EXCEPTIONS:**

1. A weather-resistant exterior wall envelope shall not be required over concrete or masonry walls designed in accordance with Chapter 6 and flashed according to Section R703.4 or R703.8.
2. Compliance with the requirements for a means of drainage, and the requirements of Sections R703.2 and R703.4, shall not be required for an exterior wall envelope that has been demonstrated to resist wind-driven rain through testing of the exterior wall envelope, including joints, penetrations and intersections with dissimilar materials, in accordance with ASTM E 331 under the following conditions:
  - 2.1. Exterior wall envelope test assemblies shall include at least one opening, one control joint, one wall/eave interface and one wall sill. All tested openings and penetrations shall be representative of the intended end-use configuration.
  - 2.2. Exterior wall envelope test assemblies shall be at least 4 feet (1219 mm) by 8 feet (2438 mm) in size.
  - 2.3. Exterior wall assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299Pa).
  - 2.4. Exterior wall envelope assemblies shall be subjected to a minimum test exposure duration of 2 hours.
3. The requirement for a means of drainage shall not be construed to mean an air space cavity under the exterior cladding for an exterior wall clad with panel or lapped siding made of plywood, engineered wood, hardboard, or fiber cement. A water-resistive barrier as required by Section R703.2 will be required on exterior walls.

The exterior wall envelope design shall be considered to resist wind-driven rain where the results of testing indicate that water did not penetrate control joints in the exterior wall envelope; joints at the perimeter of opening penetration; or intersections of terminations with dissimilar materials.



**R703.10.2 Lap siding.** Fiber-cement lap siding having a maximum width of 12 inches (305 mm) shall comply with the requirements of ASTM C 1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. Lap siding shall be lapped a minimum of 1 1/4 inches (32 mm) and lap siding shall be installed in accordance with the manufacturer's installation instructions or shall be designed to comply with Section R703.1. Lap siding courses shall be installed with the fastener heads exposed or concealed, in accordance with Table R703.3(1) or approved manufacturer's instructions.

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**R903.4.1 Secondary (emergency overflow) drains or scuppers.** Where roof drains are required, secondary emergency overflow drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line located 2 inches (51 mm) above the low point of the roof, or overflow scuppers having three times the size of the roof drains and having a minimum opening height of 4 inches (102 mm) shall be installed in the adjacent parapet walls with the inlet flow located 2 inches (51 mm) above the low point of the roof served. The installation and sizing of overflow drains, leaders and conductors shall comply with Sections 1101 and 1103 of the state plumbing code. Overflow drains shall discharge to an approved location.

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**R1001.7.1 Damper.** Masonry fireplaces shall be equipped with a ferrous metal damper located at least 8 inches (203 mm) above the top of the fireplace opening. Dampers shall be installed in the fireplace or the chimney venting the fireplace, and shall be operable from the room containing the fireplace. Fireplaces shall be provided with each of the following:

1. Tightly fitting flue dampers, operated by a readily accessible manual or approved automatic control.

**EXCEPTION:** Fireplaces with gas logs shall be installed in accordance with the *International Mechanical Code* Section 901, except that the standards for liquefied petroleum gas installations shall be NFPA 58 (*Liquefied Petroleum Gas Code*) and NFPA 54 (*National Fuel Gas Code*).

2. An outside source for combustion air ducted into the firebox. The duct shall be at least 6 square inches (3870 mm<sup>2</sup>), and shall be provided with an operable outside air duct damper.
3. Site built fireplaces shall have tightfitting glass or metal doors, or a flue draft induction fan or as approved for minimizing back-drafting. Factory built fireplaces shall use doors listed for the installed appliance.

**R1002.2 Installation.** *Masonry heaters* shall be installed in accordance with this section and shall be a masonry heater type approved by the department of ecology. Masonry heaters shall comply with one of the following:

1. *Masonry heaters* shall comply with the requirements of ASTM E 1602; or
2. *Masonry heaters* shall be *listed* and *labeled* in accordance with UL 1482 or CEN 15250 and installed in accordance with the manufacturer's installation instructions.

**R1002.2.1 Combustion air and doors.** Masonry heaters shall be provided with both of the following:

1. Primary combustion air ducted from the outside of the structure to the appliance.
2. Tightfitting ceramic glass or metal doors. Flue dampers, when provided, shall have an external control and when in the closed position shall have a net free area of not less than five percent of the flue cross sectional area.

**R1004.1.1 Emission standards for factory-built fireplaces.** No new or used factory-built fireplace shall be installed in Washington state unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558 Standard Test Method for determining particulate matter emission from fires in wood burning fireplaces. To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington state department of ecology (DOE) approved and U.S. Environmental Protection Agency (EPA) accredited laboratory.

**R1004.1.2 Emission standards for certified masonry and concrete fireplaces.** Masonry and concrete fireplace model lines certified to Washington State Building Code Standard 31-2 prior to July 1, 2013, may retain certification provided the design and construction specifications of the fireplace model line internal assembly do not change.

**R1006.4 Passageway.** This section is not adopted.

**R1006.6 Solid fuel-burning appliances and fireplaces.** Solid fuel-burning appliances and fireplaces shall be provided with tight-fitting metal or ceramic glass doors, and:

1. A source from outside the structure of primary combustion air, connected to the appliance in accordance with manufacturer's specification. The air inlet shall originate at a point below the fire box. The duct shall be 4 inches (102 mm) or greater in diameter, not exceed 20 feet (6096 mm) in length, and be installed in accordance with manufacturer's instructions; or
2. The appliance and manufacturer's recommended combustion air supply, as an installed unit, shall be certified by an independent testing laboratory to have passed Test No. 11-Negative Pressure Test, Section 12.3, of ULC S627-M1984 "Space Heaters for Use with Solid Fuels," modified as follows:

2.1. Negative pressure of 8 Pascal shall be initially established with the chamber sealed and the air supply, if not directly connected to the appliance, closed off.

2.2. The air supply if not directly connected to the appliance, shall then be opened.

2.3. The maximum allowable air exchange rate from chamber leakage and intentional air supply for the unit (appliance with combustion air supply) in the test chamber is 3.5 air changes per hour, or 28 cfm (cubic feet of air per minute), whichever is less.

**EXCEPTION:** Combustion air may be supplied to the room in which the solid fuel burning appliance is located in lieu of direct ducting, provided that one of the following conditions is met:

1. The solid fuel burning appliance is part of a central heating plant and installed in an unconditioned space in conformance with the *International Mechanical Code*; or

2. The solid fuel burning appliance is installed in existing construction directly on a concrete floor or surrounded by masonry materials as in a fireplace. The combustion air terminus shall be located as close to the solid fuel burning appliance as possible and shall be provided with a barometric damper or equivalent. The combustion air source shall be specified by the manufacturer or no less than 4 inches (102 mm) in diameter or the equivalent in area or as approved.



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**M1201.1 Scope.** The provisions of Chapters 12 through 24 shall regulate the design, installation, maintenance, *alteration* and inspection of mechanical systems that are permanently installed and utilized to provide control of environmental conditions within buildings. These chapters shall also regulate those mechanical systems, system components, equipment and appliances specifically addressed in this code.

**EXCEPTION:** The standards for liquefied petroleum gas installations shall be the 2011 Edition of NFPA 58 (*Liquefied Petroleum Gas Code*) and the 2012 Edition of ANSI Z223.1/NFPA 54 (*National Fuel Gas Code*). ||

**M1201.3 Construction documents.** The plans and specifications shall show in sufficient detail pertinent data and features of the materials, equipment and systems as herein governed including, but not limited to: Design criteria, size and type of apparatus and equipment, systems and equipment controls, provisions for combustion air to fuel burning appliances, and other pertinent data to indicate conformance with the requirements of this code. ||

**M1201.4 Testing.** At the discretion of the building official, flow testing may be required to verify that the mechanical system(s) satisfies the requirements of this code. Specific testing required by other sections of this code shall be performed. Flow testing may be performed using flow hoods measuring at the intake or exhaust points of the system, in-line pitot tube, or pitot-traverse type measurement systems in the duct, short-term tracer gas measurements, or other means approved by the building official. ||

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**M1301.2 Identification.** Each length of pipe and tubing and each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer.

**EXCEPTION:** The manufacturer identification for fittings and pipe nipples shall be on each piece or shall be printed on the fitting or nipple packaging or provided documentation.



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**M1307.2 Anchorage of appliances.** Appliances designed to be fixed in position shall be fastened or anchored in an approved manner. Thermal storage units shall be anchored or strapped to resist horizontal displacement caused by earthquake motion in accordance with one of the following:

1. Anchorage and strapping shall be designed to resist a horizontal force equal to one-third of the operating weight of the water storage tank, acting in any horizontal direction.

2. The anchorage strapping shall be in accordance with the appliance manufacturer's recommendations.

Seismic anchorage and strapping of water heaters shall be in accordance with Section 507.2 of the state plumbing code.

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**M1413.1 General.** Evaporative cooling equipment and appliances shall comply with UL 1995 or UL/CSA/ANCE 60335-2-40 and shall be installed:

1. In accordance with the manufacturer's instructions.
2. On level platforms in accordance with M1305.1.3.1.
3. So that openings in exterior walls are flashed in accordance with Section R703.4.
4. So as to protect the potable water supply in accordance with Section 603 of the state plumbing code.
5. So that air intake opening locations are in accordance with Section R303.5.1.



**M1503.2.1 Open-top broiler exhaust.** Domestic open-top broiler units shall be provided with a metal exhaust hood, having a minimum thickness of 0.0157 inch (0.3950 mm) (No. 28 gage). Such hoods shall be installed with a clearance of not less than 1/4 inch (6.4 mm) between the hood and the underside of combustible material or cabinets. A clearance of not less than 24 inches (610 mm) shall be maintained between the cooking surface and the combustible material or cabinets. The hood width shall not be less than the width of the broiler unit and shall extend over the entire unit.

**EXCEPTIONS:**

1. Broiler units that incorporate an integral exhaust system, and that are listed and labeled for use without an exhaust hood, shall not be required to have an exhaust hood.
2. Broiler units permanently installed outside the building envelope and having the cooking surface at least 5 feet below a 1-hour fire resistance rated ceiling shall not be required to have an exhaust hood.

**M1503.3 Exhaust discharge.** Domestic cooking exhaust equipment shall discharge to the outdoors through a duct. The duct shall have a smooth interior surface, shall be airtight, shall be equipped with a backdraft damper and shall be independent of all other exhaust systems. Ducts serving domestic cooking exhaust equipment shall not terminate in an attic or crawl space or areas inside the building.

**EXCEPTION:** Where installed in accordance with the manufacturer's instructions, and where continuous local exhaust is provided in an *enclosed kitchen* in accordance with Table M1505.4.4.1, listed and labeled ductless range hoods shall not be required to discharge to the outdoors.

**M1503.5 Kitchen exhaust rates.** Where domestic kitchen cooking appliances are provided with exhaust equipment, the fans shall be sized in accordance with Section M1505.4.4.1.

**M1504.3 Exhaust openings.** Air exhaust openings shall terminate as follows:

1. Not less than 3 feet (914 mm) from property lines.
2. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
3. Not less than 10 feet (3048 mm) from mechanical air intake openings except where either of the following apply:
  - 3.1. The exhaust opening is located not less than 3 feet (914 mm) above the air intake opening.
  - 3.2. The exhaust opening is part of a factory-built intake/exhaust combination termination fitting installed in accordance with the manufacturer's instructions, and the exhaust air is drawn from a living space.
4. Openings shall comply with Sections R303.5.2 and R303.6.

**M1505.1 General.** Where local exhaust or whole-house mechanical *ventilation* is provided, the ventilation system shall be designed in accordance with this section.

**EXCEPTION:** Alternate balanced whole-house *ventilation* systems and local exhaust systems designed and commissioned in accordance with ASHRAE 62.2 are permitted.

**M1505.4 Whole-house mechanical ventilation system.** Each dwelling unit shall be equipped with a ventilation system. The whole-house mechanical ventilation systems shall be designed in accordance with Sections M1505.4.1 through M1505.4.4.

**M1505.4.1 System design.** The whole-house ventilation system shall consist of one or more supply fans, one or more exhaust fans, or an ERV/HRV with integral fans, associated ducts and controls. Whole-house mechanical ventilation system supply and exhaust fans shall meet the requirements of Sections M1505.4.1.2, M1505.4.1.3, M1505.4.1.4, and M1505.4.1.5. Local exhaust fans are permitted to serve as part of the whole-house ventilation system when provided with the proper controls in accordance with Section M1505.4.2. The systems shall be designed and installed to exhaust and/or supply the minimum outdoor airflow rates required by Section M1505.4.3 as modified by whole house ventilation system coefficients in Section M1505.4.3.1 where applicable. The whole-house ventilation system shall operate continuously at the minimum ventilation rate required by Section M1505.4.2 unless configured with intermittent off controls in accordance with Section M1505.4.3.2.

**M1505.4.1.1 Whole-house system component requirements.** Whole-house ventilation supply and exhaust fans specified in this section shall have a minimum efficacy as prescribed in the *Washington State Energy Code*. Design and installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions. Whole-house ventilation fans shall be rated for sound at no less than the minimum airflow rate required by Section M1505.4.3.1. Ventilation fans shall be rated for sound at a maximum of 1.0 sone. This sound rating shall be at a minimum of 0.1 in. w.c. (25 Pa) static pressure in accordance with HVI procedures specified in Sections M1505.4.1.2 and M1505.4.1.3.

**EXCEPTION:** HVAC air handlers, ERV/HRV units, and remote mounted fans need not meet the sound requirements. To be considered for this exception, a remote mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways, and there must be at least 4 feet (1.3 m) of ductwork between the fan and the intake grille.

The whole house supply fan shall provide ducted outdoor ventilation air to each habitable space within the residential unit.

**EXCEPTION:** Interior joining spaces provided with a 30 cfm whole house transfer fan or a permanent opening with an area of not less than 8 percent of the floor area of the interior adjoining space but not less than 25 square feet do not require ducted outdoor ventilation air to be supplied directly to the space. Whole house transfer fans shall meet the sone rating of Section M1505.4.1.1 and shall have whole house ventilation controls that comply with Section M1505.4.2.

**M1505.4.1.2 Exhaust fans.** Exhaust fans required shall be ducted directly to the outside. Exhaust air outlets shall be designed to limit the pressure difference to the outside and equipped with backdraft dampers or motorized dampers in accordance with the *Washington State Energy Code*. Exhaust fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure, as applicable). Exhaust fans required in this section may be used to provide local ventilation. Bathroom exhaust fans that are designed for intermittent exhaust airflow rates higher than the continuous exhaust airflow rates in Table M1505.4.3.2 shall be provided with occupancy sensors or humidity sensors to automatically override the fan to the high speed airflow rate. The exhaust fans shall be tested and the testing results shall be submitted and posted in accordance with Section M1505.4.1.6.

**M1505.4.1.3 Supply fans.** Supply fans used in meeting the requirements of this section shall supply outdoor air from intake openings in accordance with the International Mechanical Code Sections 401.4 and 401.5. When designed for intermittent off operation, supply systems shall be equipped with motorized dampers in accordance with the *Washington State Energy Code*. Supply fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure, as applicable). Where outdoor air is provided by supply fan systems the outdoor air shall be filtered. The filter shall be accessible for regular maintenance and replacement. The filter shall have a Minimum Efficiency Rating Value (MERV) of at least 8.

**M1505.4.1.4 Balanced whole-house ventilation system.** A balanced whole-house ventilation system shall include both supply and exhaust fans. The supply and exhaust fans shall have airflow that is within 10 percent of each other. The tested and balanced total mechanical exhaust airflow rate is within 10 percent or 5 cfm, whichever is greater, of the total mechanical supply airflow rate. The flow rate test results shall be submitted and posted in accordance with Section M1505.4.1.7. The exhaust fan shall meet the requirements of Section M1505.4.1.2. The supply fan shall meet the requirements of Section M1505.4.1.3. Balanced ventilation systems with both supply and exhaust fans in a packaged product, such as an ERV/HRV shall meet the requirements of HVI 920, as applicable. Local exhaust systems that are not a component of the whole-house mechanical ventilation system are exempt from the balanced airflow calculation.

**M1505.4.1.5 Furnace integrated supply.** Systems using space heating and/or cooling air handler fans for outdoor air supply distribution are not permitted.

**EXCEPTION:** Air handler fans shall have multispeed or variable speed supply airflow control capability with a low speed operation not greater than 25 percent of the rated supply airflow capacity during ventilation only operation. Outdoor air intake openings must meet the provisions of Sections R303.5 and R303.6 and must include a motorized damper that is activated by the whole house ventilation system controller. The motorized damper must be controlled to maintain the outdoor airflow intake airflow within 10 percent of the whole house mechanical exhaust airflow rate. The flow rate for the outdoor air intake must be tested and verified at the minimum ventilation fan speed and the maximum heating or cooling fan speed. The results of the test shall be submitted and posted in accordance with Section M1505.4.1.7.

**M1505.4.1.6 Testing.** Whole-house mechanical ventilation systems shall be tested, balanced and verified to provide a flow rate not less than the minimum required by Sections M1505.4.3 and M1505.4.4.1. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device at the mechanical ventilation fan's inlet terminals, outlet terminals or grilles or in the connected ventilation ducts. Where required by the building official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the building official and be posted in the dwelling unit per Section M1505.4.1.7.

**M1505.4.1.7 Certificate.** A permanent certificate shall be completed by the mechanical contractor, test and balance contractor or other approved party and posted on a wall in the space where the furnace is located, a utility room, or an approved location inside the building. When located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label, or other required labels. The certificate shall list the flow rate determined from the delivered airflow of the whole-house mechanical ventilation system as installed and the type of mechanical whole house ventilation system used to comply with Section M1505.4.3.1.

**M1505.4.2 System controls.** The whole-house mechanical ventilation system shall be provided with controls that comply with the following:

1. The whole-house ventilation system shall be controlled with manual switches, timers or other means that provide for automatic operation of the ventilation system that are readily accessible by the occupant;
2. Whole-house mechanical ventilation system shall be provided with controls that enable manual override off of the system by the occupant during periods of poor outdoor air quality. Controls shall include permanent text or a symbol indicating their function. Recommended control permanent labeling to include text similar to the following: "Leave on unless outdoor air quality is very poor." Manual controls shall be readily accessible by the occupant;
3. Whole-house ventilation systems shall be configured to operate continuously except where intermittent off controls and sizing are provided in accordance with Section M1505.4.3.2.

**M1505.4.3 Mechanical ventilation rate.** The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with Table M1505.4.3(1) or Equation 15-1.

**Equation 15-1**

Ventilation rate in cubic feet per minute =  $(0.01 \times \text{total square foot area of house}) + [7.5 \times (\text{number of bedrooms} + 1)]$  but not less than 30 cfm for each dwelling unit

**Table M1505.4.3(1)**  
**Whole-House Mechanical Ventilation Airflow Rate**

Dwelling Unit Floor Area (square feet)	Number of Bedrooms				
	0 - 1	2	3	4	5 or more
	Airflow in cfm				
< 500	30	30	35	45	50
501 - 1,000	30	35	40	50	55
1,001 - 1,500	30	40	45	55	60
1,501 - 2,000	35	45	50	60	65
2,001 - 2,500	40	50	55	65	70
2,501 - 3,000	45	55	60	70	75
3,001 - 3,500	50	60	65	75	80
3,501 - 4,000	55	65	70	80	85
4,001 - 4,500	60	70	75	85	90
4,501 - 5,000	65	75	80	90	95

**M1505.4.3.1 Ventilation quality adjustment.** The minimum whole-house ventilation rate from Section 1505.4.3 shall be adjusted by the system coefficient in Table M1505.4.3(2) based on the system type not meeting the definition of a *balanced whole house ventilation* system and/or not meeting the definition of a *distributed whole-house ventilation* system.

$$Q_v = Q_r \times C_{\text{system}}$$

**(Equation 15-2)**

Where:  $Q_v$  = Quality-adjusted ventilation airflow rate in cubic feet per minute (cfm).

$Q_r$  = Ventilation airflow rate, cubic feet per minute (cfm) from 15-1 or Table M1505.4.3(1).

$C_{\text{system}}$  = System coefficient from Table 1505.4.3(2).

**Table M1505.4.3(2)**  
**System Coefficient ( $C_{\text{system}}$ )**

System Type	Distributed	Not Distributed
Balanced	1.0	1.25
Not balanced	1.25	1.5

**M1505.4.3.2 Intermittent off operation.** Whole-house mechanical ventilation systems shall be provided with advanced controls that are configured to operate the system with intermittent off operation shall operate for a least two hours in each four-hour segment. The whole-house ventilation airflow rate determined in accordance with Section M1505.4.3 as corrected by Section M1505.4.3.1 is multiplied by the factor determined in accordance with Table M1505.4.3.2.

**Table M1505.4.3.2**  
**Intermittent Off Whole-House Mechanical Ventilation Rate Factors** <sup>a, b</sup>

Run-time % in Each 4-hour Segment	50%	66%	75%	100%
Factor <sup>a</sup>	2	1.5	1.3	1.0

**a.** For ventilation system run-time values between those given, the factors are permitted to be determined by interpolation.

**b.** Extrapolation beyond the table is prohibited.

**M1505.4.4 Local exhaust rates.** *Local exhaust systems* shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.4.4.1. If the local exhaust fan is included in the whole-house ventilation system, in accordance with Section 1505.4.1, then the exhaust fan shall be controlled to operate as specified in Section M1505.4.2.

**M1505.4.4.1 Local exhaust.** Bathrooms, toilet rooms, and kitchens shall include a local exhaust system. Such local exhaust systems shall have the capacity to exhaust the minimum airflow rate in accordance with Table M1505.4.4.1. Fans required by this section shall be provided with controls that enable manual override or automatic occupancy sensor, humidity sensor, timer controls, or pollutant sensor controls. An "on/off" switch shall meet this requirement for manual controls. Manual fan controls shall be readily accessible in the room served by the fan.

**Table M1505.4.4.1**  
**Minimum Local Exhaust Rates**

Area to Be Exhausted	Exhaust Rates	
	Intermittent	Continuous
Open Kitchens	In accordance with Section M1505.4.4.3	Not Permitted
Enclosed Kitchens	In accordance with Section M1505.4.4.3	5 ACH based on kitchen volume
Bathrooms - Toilet rooms	50 cfm	20 cfm

**M1505.4.4.2 Local exhaust fans.** Exhaust fans shall meet the following criteria:

1. Exhaust fans shall be tested and rated in accordance with the airflow and sound rating procedures of the Home Ventilating Institute (HVI 915, HVI Loudness Testing and Rating Procedure, HVI 916, HVI Airflow Test Procedure, and HVI 920, HVI Product Performance Certification Procedure).
2. Fan airflow rating and duct system shall be designed and installed to deliver at least the exhaust airflow required by Table M1505.4.4.1. The airflows required refer to the delivered airflow of the system as installed and tested using a flow hood, flow grid, or other airflow measurement device. Local exhaust systems shall be tested, balanced, and verified to provide a flow rate not less than the minimum required by this section.
3. Design and installation of the system or equipment shall be carried out in accordance with manufacturers' installation instructions.
4. Intermittent local exhaust systems serving kitchens shall be rated for sound at a maximum of 3 sones at one or more airflow settings not less than 100 cfm at a static pressure not less than that determined at working speed as specified in HVI 916 Section 7.2.
5. Continuous local exhaust systems serving kitchens shall be rated for sound at a maximum of 1 sones at one or more airflow settings not less than 100 cfm at a static pressure not less than that determined at working speed as specified in HVI 916 Section 7.2.

**EXCEPTIONS:**

1. The installed airflow is not required to be field-verified where an exhaust airflow rating at a pressure of 0.25 in. w.g. is used, provided the duct sizing meets the prescriptive requirements of Table M1505.4.4.2.
2. Remote mounted fans need not meet sound requirements. To be considered for this exception, a remote mounted fan shall be mounted outside the kitchen, and there shall be at least 4 feet (1 m) of ductwork between the fan and the intake grille.

**Table M1505.4.4.2  
Prescriptive Exhaust Duct Sizing**

Fan Tested cfm at 0.25 inches w.g.	Minimum Flex Diameter	Maximum Length in Feet	Minimum Smooth Diameter	Maximum Length in Feet	Maximum Elbows <sup>a</sup>
50	4 inches	25	4 inches	70	3
50	5 inches	90	5 inches	100	3
50	6 inches	No Limit	6 inches	No Limit	3
80	4 inches <sup>b</sup>	NA	4 inches	20	3
80	5 inches	15	5 inches	100	3
80	6 inches	90	6 inches	No Limit	3
100	5 inches <sup>b</sup>	NA	5 inches	50	3
100	6 inches	45	6 inches	No Limit	3
125	6 inches	15	6 inches	No Limit	3
125	7 inches	70	7 inches	No Limit	3

**a.** For each additional elbow, subtract 10 feet from length.

**b.** Flex ducts of this diameter are not permitted with fans of this size.

**M1505.4.4.3 Local intermittent kitchen exhaust system.** Kitchen range hoods for domestic cooking appliances shall meet or exceed either the minimum airflow or the minimum capture efficiency in accordance with Table M1505.4.4.3. Capture efficiency ratings shall be determined in accordance with ASTM E3087.

**EXCEPTION:** Other intermittent kitchen exhaust fans, including downdraft, shall meet or exceed 300 cfm airflow.

**Table M1505.4.4.3  
Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings  
According to Kitchen Range Fuel Type**

Hood Over Electric Range	Hood Over Combustion Range
65% CE or 160 cfm	80% CE or 250 cfm

**M1505.4.4.3.1 Field verification and diagnostic testing for local intermittent kitchen exhaust system.** The local exhaust system for kitchens shall be installed to comply with local mechanical exhaust requirements specified in Section M1505.4.4.3 and shall be field verified in accordance with the procedures below to confirm the model is rated by HVI or AHAM to comply with the following requirements:

1. Local intermittent exhaust systems for kitchens shall be tested and verified to provide a minimum airflow rate or capture efficiency required by Table M1505.4.4.3. Testing shall include verification of the maximum sound rating as specified in Section M1505.4.4.3.2. Testing for the intermittent kitchen exhaust systems shall occur with the whole-house ventilation system operating and with all dwelling unit or sleeping unit entry doors closed. Testing for exhaust systems that require makeup air in accordance with Section M1503.6 shall include verifying that the mechanical makeup air system is controlled to automatically start. Testing for exhaust systems that do not require mechanical makeup air in accordance with Section M1503.6 and that are exempt from pressurize equalization shall be tested with operable openings manually opened unless design exhaust airflow can be achieved with all operable openings closed. Testing shall be performed according to the ventilation equipment manufacturer's instructions, or by using a flow hood, flow grid, or other airflow measuring device. Where required by the building official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the building official.

**EXCEPTION:** The installed airflow is not required to be field-verified where an exhaust airflow rating at a pressure of 0.25 in. w.g. is used, provided the duct sizing meets the prescriptive requirements of Table M1505.4.4.2.

2. The verification shall utilize certified rating data from the HVI Publication 911, AHAM-Certified Range Hood Directory, or another directory of certified product performance ratings approved by the code official for determining compliance. The verification procedure shall consist of visual inspection of the local intermittent kitchen exhaust system to verify and record the following information:

- 2.1. The manufacturer name and model number.
- 2.2. The model is listed in the HVI, AHAM, or equivalent directory.
- 2.3. The rated airflow value listed in the HVI, AHAM, or equivalent directory.
- 2.4. The sound rating value listed in the HVI, AHAM, or equivalent directory.
- 2.5. If the value for the rated airflow given in the directory is greater than or equal to the airflow requirements specified in Section M1505.4.4.3 and if the value for the sound rating given in the directory is less than or equal to the sound rating requirements specified in Section M1505.4.4.2, then the local intermittent kitchen exhaust system complies, otherwise the local intermittent kitchen exhaust system does not comply.



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**M1601.1.1 Above-ground duct systems.** Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to a maximum of 250°F (121°C). ||

2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions. ||

3. Fibrous duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards*. ||

4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA *HVAC Duct Construction Standards—Metal and Flexible*, except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A 653.

5. Use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation. ||

6. Duct systems shall be constructed of materials having a flame spread index not greater than 200.

7. Stud wall cavities and the spaces between solid floor joists shall not be used as a duct or an air plenum in new construction. For existing systems, stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following: ||

7.1. These cavities or spaces shall not be used as a plenum for supply air.

7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.

7.3. Stud wall cavities shall not convey air from more than one floor level.

7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fire blocking in accordance with Section R302.11. Fireblocking materials used for isolation shall comply with Section R302.11.1. ||

7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.

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**M1701.1 Scope.** Solid-fuel-burning appliances shall be provided with combustion air in accordance with the appliance manufacturer's installation instructions. Oil-fired appliances shall be provided with combustion air in accordance with NFPA 31. The methods of providing combustion air in this chapter do not apply to fireplaces, fireplace stoves and direct-vent appliances. The requirements for combustion and dilution air for gas-fired appliances shall be in accordance with Chapter 24. Fireplaces shall comply with Chapter 10.

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**Chapter 20—Boilers and water heaters.**

Informational Note: Boilers, water heaters and pressure vessels are regulated by chapter [70.79](#) RCW and chapter [296-104](#) WAC in addition to the requirements of this code.



**Section M2005.1 General.** Water heaters shall be installed in accordance with Chapter 5 of the state plumbing code, the manufacturer's instructions and the requirements of this code. Water heaters installed in an attic shall comply with the requirements of Section M1305.1.2. Gas-fired water heaters shall comply with the requirements in Chapter 24. Domestic electric water heaters shall comply with UL 174. Oil-fired water heaters shall comply with UL 732. Thermal solar water heaters shall comply with Chapter 23 and UL 174. Solid fuel-fired water heaters shall comply with UL 2523.

**M2101.3 Protection of potable water.** The potable water system shall be protected from backflow in accordance with the provisions listed in Section 603 of the state plumbing code.

||

**M2103.3 Piping joints.** Copper and copper alloy systems shall be soldered in accordance with ASTM B 828. Fluxes for soldering shall be in accordance with ASTM B 813. Brazing fluxes shall be in accordance with AWS A5.31. Piping joints that are embedded shall be installed in accordance with the following requirements:

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1. Steel pipe joints shall be welded.
2. Copper tubing shall be joined by brazing complying with Section 605 of the state plumbing code.
3. Polybutylene pipe and tubing joints shall be installed with socket-type heat-fused polybutylene fittings.
4. CPVC tubing shall be joined using solvent cement joints.
5. Polypropylene pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings.
6. Cross-linked polyethylene (PEX) tubing shall be joined using cold expansion, insert or compression fittings.
7. Raised temperature polyethylene (PE-RT) tubing shall be joined using insert or compression fittings.

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**M2105.9 CPVC plastic pipe.** Joints between CPVC plastic pipe or fittings shall be solvent-cemented in accordance with Section 605 of the state plumbing code. Threaded joints between fittings and CPVC plastic pipe shall be in accordance with Section M2105.9.1.

||

**M2105.14 PVC plastic pipe.** Joints between PVC plastic pipe or fittings shall be solvent-cemented in accordance with Section 605 of the state plumbing code. Threaded joints between fittings and PVC plastic pipe shall be in accordance with Section M2105.9.1.

||

**M2105.18 Protection of potable water.** Where ground-source heat-pump ground-loop systems have a connection to a potable water supply, the potable water system shall be protected from backflow in accordance with Section 603 of the state plumbing code.

||

**M2105.19 Pipe penetrations.** Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings through concrete or masonry building elements shall be sleeved. The annular space surrounding pipe penetrations shall be protected in accordance with Section 312 of the state plumbing code.

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**M2301.2.3 Pressure and temperature relief valves and system components.** System components containing fluids shall be protected with temperature and pressure relief valves or pressure relief valves. Relief devices shall be installed in sections of the system so that a section cannot be valved off or isolated from a relief device. Direct systems and the potable water portion of indirect systems shall be equipped with a relief valve in accordance with Section 504 of the state plumbing code. For indirect systems, pressure relief valves in solar loops shall comply with SRCC 300. System components shall have a working pressure rating of not less than the setting of the pressure relief device. ||

**M2301.2.5 Piping insulation.** Piping shall be insulated in accordance with the requirements of the state energy code. Exterior insulation shall be protected from ultraviolet degradation. The entire solar loop shall be insulated. Where split-style insulation is used, the seam shall be sealed. Fittings shall be fully insulated. ||

**M2301.4 Heat transfer gasses or liquids and heat exchangers.** *Essentially toxic transfer fluids,* ethylene glycol, flammable gasses and flammable liquids shall not be used as heat transfer fluids. Heat transfer gasses and liquids shall be rated to withstand the system's maximum design temperature under operating conditions without degradation. Heat exchangers used in solar thermal systems shall comply with Section 603.5.4 of the state plumbing code and SRCC 300. Heat transfer fluids shall be in accordance with SRCC 300. The flash point of the heat transfer fluids utilized in solar thermal systems shall be not less than 50 degrees F above the design maximum nonoperating or no-flow temperature attained by the fluid in the collector. ||

**M2301.7 Solar thermal systems for heating potable water.** Where a solar thermal system heats potable water to supply a potable hot water distribution system, the solar thermal system shall be in accordance with Sections M2301.7.1, M2301.7.2 and the state plumbing code. ||

**M2301.7.1 Indirect systems.** Heat exchangers that are components of indirect solar thermal heating systems shall comply with the state plumbing code. ||

**M2301.7.2 Direct systems.** Where potable water is directly heated by a solar thermal system, the pipe, fittings, valves and other components that are in contact with the potable water in the solar heating system shall comply with the requirements of Chapter 6 of the state plumbing code. ||

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**P2904.1.1 Required sprinkler locations.** Sprinklers shall be installed to protect all areas of a *dwelling unit*.

**EXCEPTIONS:**

1. Uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m<sup>2</sup>) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m<sup>2</sup>) in area
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

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## **Referenced standards.**

### **AHAM**

Association of Home Appliance Manufacturers  
1111 19th St N.W., #402  
Washington D.C. 20036

### **HRH-2-2019: Household Range Hoods.**

M1505.4.4.2

### **Certified Range Hood Directory**

M1505.4.4.3.1

### **ANCE**

### **NMX-J-521/2-40-ANCE—2019/CAN/CSA-22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electrical Appliances - Safety-Part 2-40: Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.**

M1403.1, M1412.1, M1413.1

### **ANSI**

### **LC 1/CSA 6.26—18: Fuel Gas Piping Systems Using Corrugated Stainless Steel Tubing (CSST).**

G2414.5.4, G2411.3, G2415.5  
403.5.5

### **ASHRAE**

### **34—2019: Designation and Safety Classification of Refrigerants.**

M1411.1

### **62.2-2019: Ventilation and Acceptable Indoor Air Quality in Residential Buildings.**

M1505.1

### **ASTM**

### **E2556/ E2556M-2010 (2016): Standard Specification for Vapor Permeable Flexible Sheet Water-Resistive Barriers Intended for Mechanical Attachment.**

M1411.1

### **E2558-2013: Standard Test Method for Determining Particulate Matter Emissions from Fires in Wood-burning Fireplaces.**

R1004.1.1

### **E3087—18: Standard Test Method for Measuring Capture Efficiency of Domestic Range Hoods.**

M1505.4.4.3.2, Table M1505.4.4.3

### **CSA**

### **CAN/CSA/C22.2 No. 60335-2-40—2012 60335-2-40—2019**

### **NMX-J-521/2-40-ANCE—2019/CAN/CSA-C22.2 No. 60335-2-40—19/UL 60335-2-40-2019 Household and Similar Electric Appliances, Part 2-40-Safety: Particular Requirements for Electric Heat Pumps, Air-Conditioners and Dehumidifiers.**

M2006.1

### **HVI**

### **HVI Publication 911: Certified Home Ventilation Products Directory.**

M1505.4.4.3.1

### **HVI Publication 915 (2016 with 2020 Update): Procedure for Loudness Rating of Residential Fan Products.**

M1505.4.1.2, M1505.4.1.3, M1505.4.4.2

### **HVI Publication 916 (2015 with 2020 Update): Air Flow Test Procedure.**

M1505.4.1.2, M1505.4.1.3, M1505.4.4.2

### **HVI Publication 920 (2020): Product Performance Certification Procedure Including Verification and Challenge.**

M1505.4.1.2, M1505.4.1.3, M1505.4.1.5, M1505.4.4.2

### **UL**

### **UL/CSA/ANCE 60335-2-40—2019 Household and Similar Electrical Appliances Safety-Part 2-40: Particular Requirements for Electrical Heat Pumps, Air Conditioners and Dehumidifiers.**

M1403.1, M1412.1, M1413.1

## Chapter 45—Existing buildings and structures.

### R4501 Scope and purpose.

**R4501.1 General.** *Repairs, alterations*, additions, and relocation of existing buildings and structures shall comply with the provisions of this code for new construction, except as modified by this chapter. Structural elements and systems shall comply with Section R102.7.1 and the provisions of this chapter.

**R4502.1 General.** The work shall not cause the building or structure to become unsafe or adversely affect the performance of the building; shall not cause an existing mechanical or plumbing system to become unsafe, hazardous, insanitary, or overloaded; and unless expressly permitted by these provisions, shall not make the building any less compliant with this code or to any previously approved alternative arrangements than it was before the work was undertaken.

**R4502.2 Structural.** Structural elements and systems that are altered, repaired, or replaced shall comply with the structural provisions of this chapter and of Chapter 3 through Chapter 10 of the *International Residential Code* unless noted otherwise.

**R4502.2.1 Minimum design loads.** The minimum design loads for the structure shall be the loads applicable at the time the building was constructed. The minimum design loads for the structural components shall comply with the *International Residential Code*. Structural elements that are uncovered during the course of the alteration and that are found to be unsafe shall be repaired in accordance with Section R102.7.1.

**R4502.2.2 Unreinforced masonry parapet bracing.** Unreinforced masonry buildings located in Seismic Design Category D0, D1, or D2 shall have parapet bracing and wall anchors installed at the roofline whenever a reroofing permit is issued. Such parapet bracing and wall anchors shall be of an approved design unless an evaluation demonstrates compliance of the existing bracing and anchorage.

**R4502.3 Smoke alarms.** Smoke alarms shall be provided in accordance with Section R314.2.2.

**R4502.4 Carbon monoxide alarms.** Carbon monoxide alarms shall be provided in accordance with Section R315.2.2.

**R4502.5 Replacement windows.** Where an existing window, including the sash and glazed portion, or safety glazing is replaced, the replacement window or safety glazing shall comply with the requirements of Sections 4502.5.1 through 4502.5.5 as applicable.

**R4502.5.1 Energy efficiency.** Replacement windows shall comply with the requirements of the Washington State Energy Code-Residential.

**R4502.5.2 Safety glazing.** Replacement glazing in hazardous locations shall comply with the safety glazing requirements of Section R308.

**R4502.5.3 Window fall protection.** Window fall protection shall be installed in accordance with Section R312.2.

**EXCEPTION:** Where only the window glazing is being replaced.

**R4502.5.4 Replacement windows for emergency escape and rescue openings.** Replacement windows shall be exempt from Sections R310.2 and R310.4.4, provided that the replacement window meets the following conditions:

1. The replacement window is the manufacturer's largest standard size window that will fit within the existing frame or existing rough opening. The replacement window is of the same operating style as the existing window or a style that provides for an equal or greater window opening area than the existing window.
2. The replacement window is not part of a change of use.

**R4502.5.5 Window opening control device and fall protection device height.** Window opening control devices or fall protection device shall be located at a height in accordance with Section R310.1.1 or at as low a height as can be installed within the existing clear opening.

**R4502.6 Flood hazard areas.** Work performed in existing buildings located in a flood hazard area as established by Table R301.2 shall be subject to the provisions of Section R105.3.1.1.

**R4503.1 General.** *Repairs* shall comply with the applicable provisions of the code for new construction or as permitted by this section. Work on undamaged components that is necessary for the required repair of damaged components shall be considered part of the repair and shall not be subject to requirements for *alterations*.

**R4503.2 Materials.** Materials used during *repairs* shall comply with this section.

**R4503.2.1 New and replacement materials.** Except as otherwise required or permitted by this code, materials permitted by this code for new construction, shall be used. Like materials shall be permitted for *repairs*, provided that *unsafe* conditions are not created. Hazardous materials shall not be used where this code does not permit their use in buildings of similar occupancy, purpose, and location.

**R4503.2.2 Existing materials.** Materials already in use in a building in compliance with requirements or approvals in effect at the time of their erection or installation shall be permitted to remain in use unless determined by the building official to be *unsafe*.

**R4503.2.3 Plumbing materials and supplies.** The following plumbing materials and supplies shall not be used:

1. All-purpose solvent cement, unless listed for the specific application.
2. Flexible traps and tailpieces, unless listed for the specific application.
3. Solder having more than 0.2-percent lead in the repair of potable water systems.

**R4503.3 Water closets.** Where any water closet is replaced with a newly manufactured water closet, the replacement water closet shall comply with the requirements of Uniform Plumbing Code Section 411.

**R4503.4 Structural.** Repaired structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this chapter.

**R4503.5 Demolition and replacement.** Where a building or structure is effectively demolished by damage or where the intended method of repair is demolition and replacement, the replaced building, including its replaced foundation, shall comply with requirements for new construction in the *International Residential Code*.

**EXCEPTION:** Existing foundations are permitted to remain and be reused where approved by the code official.

**R4504.1 General.** *Alterations* to existing buildings shall comply with the provisions of this code for new construction, except as permitted by this section.

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**R4504.2 Newly constructed elements.** Newly constructed elements, components, and systems shall comply with the requirements of this code.

**EXCEPTION:** Added openable windows are not required to comply with the light and ventilation requirements of Section R303.

**R4504.3 Nonconformities.** The work shall not increase the extent of noncompliance or create nonconformity to those requirements that did not previously exist.

**R4504.4 Structural.** Altered structural elements and systems shall comply with Section R102.7.1 and the structural provisions of this chapter. New elements shall meet all of the requirements of this code for new construction. Structural elements that are uncovered during the course of the alteration and that are found to be unsafe shall be repaired in accordance with Section R102.7.1.

**R4504.4.1 Decreased structural capacity.** Where an alteration causes a decrease in capacity in any structural component, that structural component shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8.

**R4504.4.2 Increased structural loads.** Where an alteration causes an increase in loads as described in this section, the existing structural components that support the increased load, including the foundation, shall be shown to comply or shall be altered to comply with the applicable provisions of Chapters 3, 4, 5, 6, and 8. Existing structural components that do not provide support for the increased loads shall not be required to comply with this section.

**R4504.4.2.1 Dead load increase.** Dead load shall be considered to be increased for purposes of this section when the weight of materials used for the *alteration* exceeds the weight of the materials replaced, or when new materials or elements are added.

**EXCEPTIONS:**

1. Buildings in which the increase in dead load is due entirely to the addition of a second layer of roof covering weighing 3 pounds per square foot (0.1437 kN/m<sup>2</sup>) or less over an existing single layer of roof covering.
2. Installation of rooftop-mounted photovoltaic (PV) panel systems weighing 4 pounds per square foot or less over an existing single layer of roof covering.

**R4504.4.2.2 Live load increase.** An increase in live load shall be determined based on Table R301.5.

**R4504.4.2.3 Snow load increase.** Snow load shall be considered to be increased for purposes of this section when alteration of the roof configuration creates new areas that accumulate drifted snow.

**R4504.4.2.4 Wind load increase.** Wind load shall be considered to be increased for purposes of this section when the surface area of any exterior elevation subject to wind pressure is increased by more than 5 percent.

**R4504.4.2.5 Seismic load increase.** Seismic load shall be considered to be increased for purposes of this section in *existing buildings* assigned to Seismic Design Category C, D0, D1, or D2 where new materials replace lighter weight materials in one of the following conditions:

1. Concrete tile or tile roof covering of similar weight is installed on more than 50 percent of the total roof area.
2. Brick veneer or cladding of similar weight is installed on walls above the second story.

**R4504.5 Ventilation.** Reconfigured spaces intended for occupancy and spaces converted to habitable or occupiable space in any work area shall be provided with ventilation in accordance with Section R303.

**R4504.6 Ceiling height.** Where a habitable attic or habitable space in a basement is created in an existing building, ceiling height shall not be less than 6 foot 8 inches (2032 mm). Bathrooms, toilet rooms, and laundry rooms shall have a ceiling height of not less than 6 feet 4 inches (1931 mm).

**EXCEPTIONS:**

1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 6 feet 8 inches (2134 mm).
2. At beams, girders, ducts, or other obstructions, the ceiling height shall be not less than 6 feet 4 inches (1931 mm) from the finished floor.

**R4504.7 Stairways, handrails, and guards.** Stairs, handrails, and guards shall comply with this section.

**R4504.7.1 Stairway illumination.** Stairways within the work area shall be provided with illumination in accordance with Section R303.6.

**R4504.7.2 Stair width.** Existing stairs not otherwise being altered or modified shall be permitted to maintain their current clear width at, above and below existing handrails.

**R4504.7.3 Stair headroom.** Headroom height on existing stairs being altered or modified shall not be reduced below the existing stairway finished headroom. Existing stairs not otherwise being altered shall be permitted to maintain the current finished headroom.

**R4504.7.4 Stair landing.** Landings serving existing stairs being altered or modified shall not be reduced below the existing stairway landing depth and width. Existing stairs not otherwise being altered shall be permitted to maintain the current landing depth and width.

**R4504.7.5 Stair treads and risers.** An existing stairway shall not be required to comply with Section R311.7.5 where the existing space and construction does not allow a reduction in pitch or slope. Where risers are added to an existing stair, the tread and riser dimensions of the added risers shall match the existing stair.

**R4504.7.6 Handrails and guards.** Where a stair or any portion of a stair is reconstructed, a handrail and guard, where required, shall be provided in accordance with Section R311 and R312.

**R4505.1 Additions to an existing building.** Additions shall comply with this section and other applicable provisions of this code for new construction.

**R4505.2 Structure for horizontal additions.** Where an addition involves new construction next to and attached to an existing building and includes alterations to the existing building, the *addition* shall meet all of the requirements of this code for new construction. Alterations to the existing building shall comply with the requirements governing alterations within this code. In wood light-frame additions, connection of the structural components shall be permitted to be provided using wall top plates and addition studs that abut the existing building. Wall top plates shall be lapped and spliced in accordance with Section R602.3.2. Abutting studs shall be fastened in accordance with Table R602.3(1).

**EXCEPTION:** The structural components of the *addition* shall be permitted to be connected to the existing building in accordance with accepted engineering practice.

**R4505.3 Structure for vertical additions.** Where an addition involves new construction that adds a story to any part of the existing building or vertically increases the height of any part of the existing building, the new construction and the existing building together shall meet all of the requirements of this code for new construction.

**EXCEPTION:** Where the new structure and the existing structure together are evaluated in accordance with accepted engineering practice and are shown to be sufficient to support the combined loads from the new structure and existing structure, no structural alterations are required.



**R4506.1 Relocated buildings.** Residential buildings or structures moved into or within the jurisdiction are not required to comply with the requirements of this code if the original use classification of the building or structure is not changed. Any repair, alteration, or change of use undertaken within the relocated structure shall comply with the requirements of this code applicable to the work being performed.

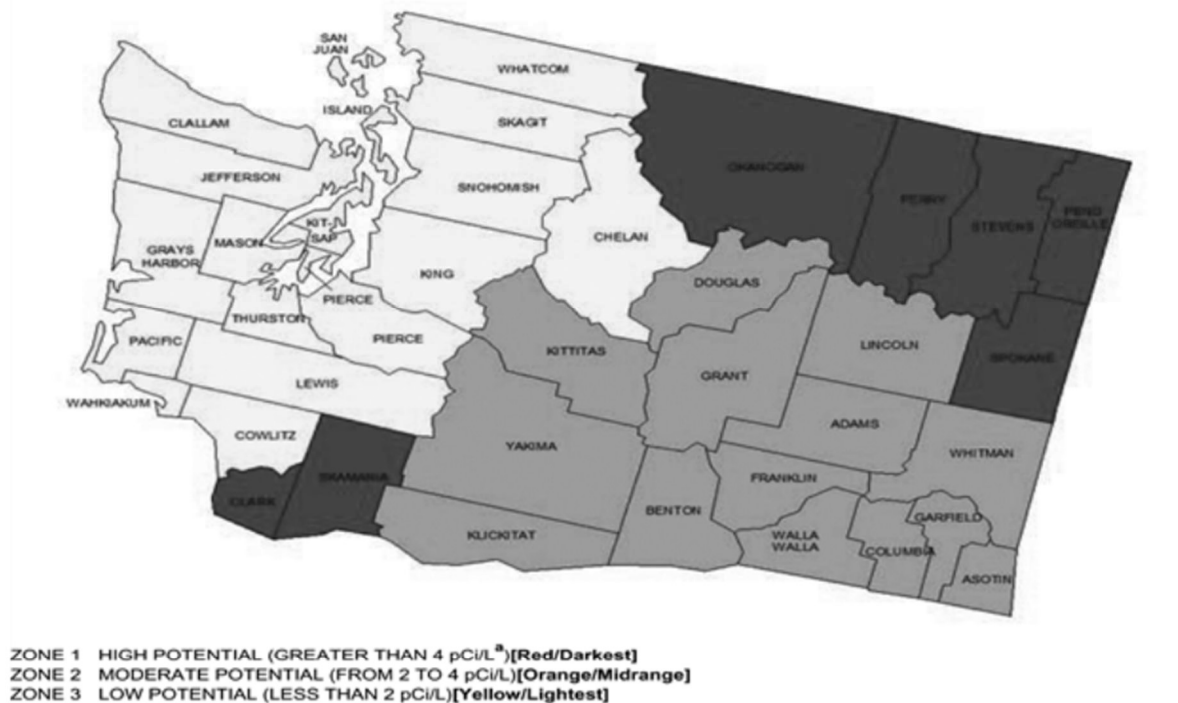
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**AF101.1 General.** This appendix contains requirements for new construction in jurisdictions where radon-resistant construction is required. Inclusion of this appendix by jurisdictions shall be required in high radon potential counties as determined in Figure AF101 and as listed in Table AF101(1). Unvented crawl spaces are not permitted in any high radon potential county. In other areas, requirements of this appendix apply to any structure constructed with unvented crawl spaces as specified in R408.3.

(FIGURE AF101 EPA MAP OF RADON ZONES LEGEND)



a. pCi/L standard for picocuries per liter of radon gas. EPA recommends that all homes that measure 4 pCi/L and greater be mitigated.

The United States Environmental Protection Agency and the United States Geological Survey have evaluated the radon potential in the United States and have developed a map of radon zones designed to assist building officials in deciding whether radon-resistant features are applicable in new construction.

The map assigns each of the 3,141 counties in the United States to one of three zones based on radon potential. Each zone designation reflects the average short-term radon measurement that can be expected to be measured in a building without the implementation of radon control methods. The radon zone designation of highest priority is Zone 1. Table 1 of this appendix lists the Zone 1 counties illustrated on the map. More detailed information can be obtained from state-specific booklets (EPA-402-R-93-021 through 070) available through State Radon Offices or from U.S. EPA Regional Offices.

**TABLE AF101(1) HIGH RADON POTENTIAL (ZONE 1) COUNTIES<sup>a</sup>**

**WASHINGTON:** Clark, Ferry, Okanogan, Pend Oreille, Skamania, Spokane, Stevens.

a. EPA recommends that this county listing be supplemented with other available state and local data to further understand the radon potential of Zone 1 areas.

**AF103.1 General.** The following construction techniques are intended to resist radon entry and prepare the building for post-construction radon mitigation, if necessary (see Figure AF103.1). These techniques are required in high radon potential counties designated in Table AF101(1).

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## **AQ102 Definitions.**

**EGRESS ROOF ACCESS WINDOW.** See Chapter 2.

**LANDING PLATFORM.** See Chapter 2.

**LOFT.** See Chapter 2.

**TINY HOUSE.** A *dwelling unit* that is 400 square feet (37 m<sup>2</sup>) or less in floor area excluding *sleeping lofts*.

**AQ103.1 Minimum ceiling height.** Habitable space in tiny houses shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). Bathrooms, toilet rooms and kitchens shall have a ceiling height of not less than 6 feet 4 inches (1930 mm). Obstructions including, but not limited to, beams, girders, ducts and lighting, shall not extend below these minimum ceiling heights.

**EXCEPTION:** Ceiling heights in *lofts* shall be in accordance with Section R333.

## **AQ104 Energy conservation.**

**AQ104.1 Air leakage testing.** The air leakage rate for tiny houses shall not exceed 0.30 cfm at 50 Pascals of pressure per square foot of the dwelling unit enclosure area. Testing shall be conducted in accordance with RESNET/ICC 380, ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed after the continuous air barrier, including all penetrations, is completed and sealed.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, if installed at the time of the test, shall be open.
4. Exterior louvers for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.
5. Heating and cooling systems, if installed at the time of the test, shall be turned off.
6. Supply and return registers, if installed at the time of the test, shall be fully open.

**AQ104.1.1 Whole-house mechanical ventilation.** Where an air leakage rate not exceeding 0.30 cfm per ft of the dwelling unit enclosure area in accordance with Section AQ106.1 is provided, the tiny house shall be provided with whole-house mechanical ventilation in accordance with Section M1505.4.

**AQ105 Emergency escape and rescue openings.** This section is not adopted.

**AQ106 Energy conservation.** This section is not adopted.

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**Appendix T—Solar-ready provisions-detached one- and two-family dwellings and townhouses.**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

**AT102 General definitions.**

**AT102.1 General.** The following term shall, for the purpose of this appendix, have the meaning shown herein. ||

**Solar-ready zone.** A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic or solar water-heating system. ||

**AT103.3 Solar-ready zone area.** The total solar-ready zone area shall be not less than 300 square feet (27.87 m<sup>2</sup>) exclusive of mandatory access or set back areas as required by this code. New townhouses three stories or less in height above grade plane and with a total floor area less than or equal to 2,000 square feet (185.8 m<sup>2</sup>) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m<sup>2</sup>). The solar-ready zone shall be composed of areas not less than 5 feet (1.52 m) in width and not less than 80 square feet (7.44 m<sup>2</sup>) exclusive of access or set back areas as required in this code or the applicable provisions of the *International Fire Code*. No portion of the solar zone shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north. ||

**AT103.6 Capped roof penetration sleeve.** A capped roof penetration sleeve shall be provided adjacent to a solar-ready zone when the solar-ready zone has a roof slope of 2:12 or less. The capped roof penetration sleeve shall be sized to accommodate the future photovoltaic system conduit, but shall have an inside diameter not less than 1 1/4 inches. ||



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## **Appendix AWU—Dwelling unit fire sprinkler systems.**

The design and installation of residential fire sprinkler systems shall be in accordance with the 2018 International Residential Code Section P2904 Dwelling Unit Fire Sprinkler Systems.

**P2904.1.1 Required sprinkler locations.** Sprinklers shall be installed to protect all areas of a dwelling unit.

**EXCEPTIONS:**

1. Uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m<sup>2</sup>) in area, with the smallest dimension not greater than 3 feet (915 mm) and having wall and ceiling surfaces of gypsum board.
3. Bathrooms not more than 55 square feet (5.1 m<sup>2</sup>) in area.
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

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## **Appendix AWW—Fire sprinklers.**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

**AWV107.1 Fire sprinklers.** An approved automatic fire sprinkler system shall be installed in new one-family and two-family dwellings and townhouses in accordance with Appendix U.

## **Appendix AWY—Construction and demolition material management.**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

### **AWY101 General.**

**AWY101.1 Purpose.** The purpose of this code section is to increase the reuse and recycling of construction and demolition materials.

**AWY101.2 Scope.** This code section applies to new *buildings* and *structures* construction, *alterations* to existing *buildings* and *structures* and the *demolition* of existing *buildings* and *structures* having a work area greater than 750 square feet or with a project value greater than \$75,000, whichever is more restrictive.

**EXCEPTION:** Projects determined to be unsafe.

### **AWY102 General definitions.**

**AWY 102.1 General.** The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

**Demolition.** The process of razing, relocating, or removing an existing *building* or *structure*, or a portion thereof.

**Divert, diverted, or diversion.** The *reuse*, *recycling*, or beneficial use of construction and *demolition* materials.

**Recycling.** The process of transforming or remanufacturing waste materials into useable or marketable materials for use other than landfill disposal or incineration.

**Reuse.** The return of a material into the economic stream for use.

**Salvage.** The recovery of construction and *demolition building* material and components from a *building* or site in order to increase the *reuse* or repurpose potential of these materials and decrease the amount of material being sent to the landfill. *Salvaged* material may be sold, donated, or reused on site.

### **AWY103 Construction and demolition material management.**

**AY103.1 Collection containers.** All sites where *recyclable* construction and *demolition* materials are generated and transported for *recycling* must provide a separate container for *nonrecyclable* materials pursuant to WAC [173-345-040](#).

**AWY103.2 Salvage assessment.** A *salvage* assessment shall be submitted prior to *permit* issuance. The *salvage* assessment shall identify the *building* components of an existing *building* that, if removed, have the potential to be *reused*. This assessment shall be signed by the *owner* and serve as an affidavit stating that the project shall be executed in compliance with the requirements of this code.

**EXCEPTION:** Projects that include only new construction.

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**AWY103.3 Waste diversion report.** A waste diversion report shall be submitted prior to issuance of the Certificate of Occupancy or approval of final inspection. The waste diversion report shall identify the following:

1. Weight or volume of project-generated construction and *demolition* material;
2. Whether the material was disposed in a landfill or *diverted*;
3. The hauler of the material;
4. The receiving facility or location; and
5. The date materials were accepted by the receiving facility or location.

## **Appendix AWZ—Building deconstruction.**

The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.

### **AWZ101 General.**

**AWZ101.1 Purpose.** The purpose of this section is to increase the amount of material *salvaged* for *reuse* through the act of *deconstruction* when a *building* or *structure* is *demolished*. Used sawn lumber is permitted to be *reused* in accordance with Section R602.1.1.1.

**AWZ101.2 Scope.** This section applies to existing dwellings, townhouses, and accessory structures permitted to be demolished that are greater than 750 square feet and meet one of the following:

1. The structure has been identified as a historic building; or
2. The structure was built 90, or more, years ago.

**EXCEPTIONS:** 1. The structure is determined to be unsafe by the engineer of record;  
2. The structure shall be relocated;  
3. The engineer of record determines that 50 percent, by weight, of the material in the structure that is not concrete, is not suitable for reuse.

### **AWZ102 General definitions.**

**AWZ102.1 General.** The following words and terms shall, for the purposes of this appendix, have the meanings shown herein. Refer to Chapter 2 of this code for general definitions.

**Deconstruction.** The systematic disassembly of a *structure*, in order to *salvage building* materials or components for the primary purpose of *reusing* materials to the maximum extent possible, with a secondary purpose of *recycling* the remaining materials.

**Demolition.** The process of razing, relocating, or removing an existing *building* or *structure*, or a portion thereof.

**Heavy machinery.** Heavy machinery includes, but is not limited to, track hoes, excavators, skid steer loaders, or forklifts.

**Recycling.** The process of transforming or remanufacturing waste materials into useable or marketable materials for use other than landfill disposal or incineration.

**Reuse.** The return of a material into the economic stream for use.

**Salvage.** The recovery of construction and *demolition building* material and components from a *building* or site in order to increase the *reuse* or repurpose potential of these materials and decrease the amount of material being sent to the landfill. *Salvaged* material may be sold, donated, or *reused*.

### **AWZ103 Deconstruction.**

**AWZ103.1 Deconstruction.** Buildings and structures meeting the requirements of Section AZ101.2 shall be deconstructed.

**AWZ103.2 Heavy machinery.** Heavy machinery may not be used in deconstruction to remove or dismantle components of buildings and structures in ways that render the components unsuitable for salvage.