CITY OF SEATTLE

ORDINANCE _____

COUNCIL BILL _____

..title

AN ORDINANCE relating to the Seattle Residential Code; amending Section 22.150.010of the Seattle Municipal Code; and adopting by reference Chapters 2 through 10, 12 through 24, Section P2904, Chapter 44, and Appendices F and U of the 2015 International Residential Code (IRC), and amending certain of those chapters; adding a new Chapter 1 to the IRC related to administration, permitting, and enforcement; and repealing Sections 2 through 20 of Ordinance 124282.

..body

BE IT ORDAINED BY THE CITY OF SEATTLE AS FOLLOWS:

Section 1. Section 22.150.010 of the Seattle Municipal Code, last amended by Ordinance 124282, is amended as follows:

22.150.010 Adoption of ((~~International~~)) Seattle Residential Code

The Seattle Residential Code is adopted and consists of: 1) ((~~the following portions of the 2012 edition of the International Residential Code published by the International Code Council:~~)) Chapters 2 through 10, Chapters 12 through 24, Section P2904, Chapter 44, Appendices F and ((~~G~~)) U of the 2015 edition of the International Residential code as amended by the ordinance introduced as Council Bill 118780, and ((~~; 2) the amendments and additions to the 2012 International Residential Code adopted by City Council by ordinance; and 3) a~~)) 2) Chapter 1 ((~~relating to administration, permitting and enforcement~~)) as adopted ((~~by City Council by~~)) in Section 2 of the ordinance introduced as Council Bill 118780. One copy of the ((~~2012~~)) 2015 International Residential Code is filed with the City Clerk in ((~~C.F. 313188~~)) Clerk File 319950.

Section 2. Chapter 1 of the Seattle Residential Code is adopted to read as follows:

CHAPTER 1

ADMINISTRATION

SECTION R101

TITLE, SCOPE AND PURPOSE

R101.1 Title. This subtitle shall be known as the "*Seattle Residential Code*" and may be so cited, and is referred to herein as "this code."

R101.2 Scope. This code applies to the construction, alteration, moving, addition, demolition, repair, equipment, maintenance and occupancy 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 419 of the *International Building Code* are permitted to be constructed in accordance with this code. Fire suppression equipment required by Section 419.5 of the *International Building Code* shall conform to Section P2904 of this code.

[W] 2. Owner-occupied lodging houses with one or two guestrooms are permitted to be constructed in accordance with this code.

[W] 3. Owner-occupied lodging houses with three to five guestrooms are permitted to be constructed in accordance with this code when equipped with a fire sprinkler system that complies with Section P2904.

4. Floating on-water residences as defined in the Seattle Municipal Code Title 23 are not required to comply with this Code.

Note: The seismic design for wood-frame buildings with more than two stories above grade are required to comply with the *International Building Code* or other standards referenced in Section R301.1. See Sections R301.2.2.3 and Table R602.10.3(3)

Interpretation R101.2a: Buildings with mixed occupancies, other than residences with home occupations, are not within the scope of the *Seattle Residential Code* and shall comply with the *Seattle Building Code*.

Interpretation R101.2b: Three or more dwellings located above a common garage or other common space are required to comply with the *Seattle Building Code*. Units in detached one- and two-family dwellings may share common space.

R101.3 Applicability of city laws. A building permit application shall be considered under the applicable city law in effect on the date a valid and fully complete building permit application is submitted or on a date as otherwise required by law.

Exception: For any project for which an associated, unexpired master use permit has been issued, a building permit application shall be considered under the versions of Seattle Municipal Code Title 23, Seattle Land Use Code; Seattle Municipal Code Chapter 25.09, Environmentally Critical Areas regulations; and Seattle Municipal Code Chapter 25.09, Tree Protection regulations in effect on the date established by Seattle Municipal Code Section 23.76.026 or 23.76.032.C.1 for consideration of the master use permit, unless that date is later than the date of the complete building permit application. This exception does not apply to a subdivision or short subdivision component of a master use permit.

Note: Applicable city law includes but is not limited to the Seattle Municipal Code Title 23, Seattle Land Use Code; Seattle Municipal Code Chapter 25.09, Environmentally Critical Areas regulations; Seattle Municipal Code Chapter 25.09, Tree Protection regulations; and the Seattle Residential, Energy, Stormwater, Grading and Side Sewer codes.

R101.3.1 Complete building permit applications. A building permit application is complete if the building official determines it meets the requirements of Sections R105.5 through R105.6.4, and the application includes, without limitation, the construction documents for the architectural and structural components of the building.

Exception: If the building official allows a building permit application to be submitted in phases for portions of a building, each phased portion submittal shall meet the requirements of Sections R105.5 through R105.6.4 applicable to the scope of the allowed phased portion, and the building permit application shall be considered complete for the purposes of Section R101.3 on the date the phased portion submittal that includes the structural frame for the entire building is submitted.

R101.4 Purpose. The purpose of this code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, occupancy, location and maintenance of buildings and structures within the City and certain equipment specifically regulated herein. The purpose of this code is to provide for and promote the health, safety and welfare of the general public, and not to create or otherwise establish or designate any particular class or group of persons who will or should be especially protected or benefitted by the terms of this code.

R101.5 Internal consistency. Where in any specific case, different sections of this code specify different materials, methods of construction or other requirements, the most restrictive governs. Where there is a conflict between a general requirement and a specific requirement, the specific requirement governs.

R101.6 Referenced codes and standards. The codes and standards referenced in this code are considered part of this code to the extent prescribed by each such reference. If differences occur

between provisions of this code and referenced codes and standards, the provisions of this code apply, except that nothing in this code limits the effect of any provision of the Grading Code, Stormwater Code, or Regulations for Environmentally Critical Areas.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and manufacturer's instructions apply.

R101.7 Appendices. Provisions in the appendices of the *International Residential Code* do not apply unless specifically adopted.

R101.8 Metric units. Wherever in this code there is a conflict between metric units of measurement and U.S. customary units, the U.S. customary units govern.

SECTION R102

UNSAFE BUILDINGS, STRUCTURES OR PREMISES

R102.1 Emergency order. Whenever the building official finds that any building or structure or premises, or portion thereof is in such a dangerous and unsafe condition as to constitute an imminent hazard to life or limb, the building official may issue an emergency order. The emergency order may (1) direct that the building, structure or premises, or portion thereof be restored to a safe condition by a date certain; (2) require that the building, structure or premises, or portion thereof, be vacated within a reasonable time to be specified in the order, or in the case of extreme danger, may specify immediate vacation of the building, structure or premises, or portion thereof; or (3) authorize immediate disconnection of the utilities or energy source.

R102.1.1 Service of emergency order. The order shall be posted on the premises or personally served on the owner of the building or premises or any person responsible for the condition. The order shall specify the time for compliance.

R102.1.2 Effect of emergency order. No person may occupy a building, structure or premises, or portion thereof, after the date on which the building is required to be vacated until the building, structure or premises, or portion thereof, is restored to a safe condition as required by the order and this code. It is a violation for any person to fail to comply with an emergency order issued by the building official.

R102.2 Hazard correction order. Whenever the building official finds that an unsafe building, structure or premises exists, the building official may issue a hazard correction order specifying the conditions causing the building, structure or premises to be unsafe and directing the owner or other person responsible for the unsafe building, structure or premises to correct the condition by a date certain. In lieu of correction, the owner may submit a report or analysis to the building official analyzing said conditions and establishing that the building, structure or premises is, in fact, safe. The building official may require that the report or analysis be prepared by a licensed engineer and may require compliance with *International Existing Building Code*.

R102.2.1 Service of hazard correction order. The order shall be served upon the owner, agent or other responsible person by personal service or regular first class mail addressed to the last known address of such person or if no address is available after reasonable inquiry, the order may be posted in a conspicuous place on the premises. The order may also be posted if served by personal service or first class mail.

R102.2.2 Effect of hazard correction order. It is a violation for any person to fail to comply with a hazard correction order as specified in this subsection.

SECTION R103

ENFORCEMENT, VIOLATIONS AND PENALTIES

R103.1 Violations. It is a violation of this code for any person to:

1. Erect, construct, enlarge, repair, move, improve, remove, convert, demolish, equip, occupy, inspect or maintain any building or structure, or cause or permit the same to be done, in the City, contrary to or in violation of any of the provisions of this code;
2. Knowingly aid, abet, counsel, encourage, hire, induce or otherwise procure another to violate or fail to comply with this code;
3. Use any material or to install any device, appliance or equipment that does not comply with applicable standards of this code or that has not been approved by the building official;
4. Violate or fail to comply with any notice or order issued by the building official pursuant to the provisions of this code or with any requirements of this code;
5. Remove, mutilate, destroy or conceal any notice or order issued or posted by the building official pursuant to the provisions of this code, or any notice or order issued or posted by the building official in response to a natural disaster or other emergency;
6. Conduct work under a permit without requesting an inspection as required by Section R106.

R103.2 Notice of violation. If, after investigation, the building official determines that standards or requirements of this code have been violated or that orders or requirements have not been complied with, the building official may issue a notice of violation upon the owner, agent or other person responsible for the action or condition. The notice of violation shall state the standards or requirements violated, shall state what corrective action, if any, is necessary to comply with the standards or requirements, and shall set a reasonable time for compliance.

R103.2.1 Service of notice of violation. The notice shall be served upon the owner, agent or other responsible person by personal service or regular first class mail addressed to the last

known address of such person, or if no address is available after reasonable inquiry, the notice may be posted in a conspicuous place on the premises. The notice may also be posted if served by personal service or first class mail. Nothing in this section limits or precludes any action or proceeding to enforce this code, and nothing obligates or requires the building official to issue a notice of violation prior to the imposition of civil or criminal penalties.

R103.2.2 Review of notice of violation by the building official. Any person affected by a notice of violation issued pursuant to Section R103.2 may obtain a review of the notice by making a request in writing to the building official within ten days after service of the notice. When the last day of the period computed is a Saturday, Sunday, or City holiday, the period runs until 5 p.m. of the next business day.

R103.2.2.1 Review procedure. The review shall occur not less than ten nor more than 20 days after the request is received by the building official unless otherwise agreed to by the person requesting the review. Any person affected by the notice of violation may submit additional information to the building official. The review shall be made by a representative of the building official who will review any additional information that is submitted and the basis for issuance of the notice of violation. The reviewer may request clarification of the information received and may conduct a site visit.

R103.2.2.2 Decision. After the review, the building official shall:

1. Sustain the notice;
2. Withdraw the notice;
3. Continue the review to a date certain; or
4. Amend the notice.

R103.2.2.3 Order. The building official shall issue an order containing the decision within 15 days of the date that the review is completed and shall cause the order to be mailed by regular first class mail to the persons requesting the review and the persons named on the notice of violation, addressed to their last known address.

R103.3 Stop work orders. The building official may issue a stop work order whenever any work is being done contrary to the provisions of this code, or contrary to a permit issued by the building official, or in the event of dangerous or unsafe conditions related to construction or demolition. The stop work order shall identify the violation and may prohibit work or other activity on the site.

R103.3.1 Service of stop work order. The building official shall serve the stop work order by posting it in a conspicuous place at the site. If posting is not physically possible, then the stop work order may be served by personal service or by regular first class mail to the last known address of: the property owner, the person doing or causing the work to be done, or the holder of a permit if work is being stopped on a permit. For purposes of this section, service is complete at the time of posting or of personal service, or if mailed, three days after the date of mailing. When the last day of the period so computed is a Saturday, Sunday or city holiday, the period runs until 5 p.m. on the next business day.

R103.3.2 Effective date of stop work order. Stop work orders are effective when posted, or if posting is not physically possible, when one of the persons identified in Section R103.3.1 is served or, if notice is mailed, three days after the date of mailing.

R103.3.3 Review of stop work orders by the building official. Any person aggrieved by a stop work order may obtain a review of the order by delivering to the building official a request in writing within two business days of the date of service of the stop work order.

R103.3.3.1 Review procedure. The review shall occur within two business days after receipt by the building official of the request for review unless otherwise agreed by the person making the request. Any person affected by the stop work order may submit additional information to the building official for consideration as part of the review at any time prior to the review. The review will be made by a representative of the building official who will review all additional information received and may conduct a site visit.

R103.3.3.2 Decision. After the review, the building official may:

1. Sustain the stop work order;

2. Withdraw the stop work order;

3. Modify the stop work order; or

4. Continue the review to a date certain.

R103.3.3.3 Order. The building official shall issue an order of the building official containing the decision within two business days after the review is completed and shall cause the order to be sent by regular first class mail to the person or persons requesting the review, any person on whom the stop work order was served, and any other person who requested a copy before issuance of the order, addressed to their last known address.

R103.4 Occupancy violations. Whenever any building or structure is being occupied contrary to the provisions of this code, the building official may order such occupancy discontinued and the building or structure, or portion thereof, vacated by notice.

R103.4.1 Service of notice of occupancy violation. The notice of occupancy violation shall be served upon the owner, agent or other responsible person by personal service or regular first class mail addressed to the last known address of such person or if no address is available after reasonable inquiry, the notice may be posted in a conspicuous place on

the premises. The notice may also be posted if served by personal service or first class mail.

R103.4.2 Compliance with notice of occupancy violation. Any person occupying the building or structure shall discontinue the occupancy by the date specified in the notice of the building official, or shall make the building or structure, or portion thereof, comply with the requirements of this code; provided, however, that in the event of an unsafe building, Section 102 may apply.

R103.5 Civil penalties. Any person violating or failing to comply with the provisions of this code shall be subject to a cumulative civil penalty in an amount not to exceed $500 per day for each violation from the date the violation occurs or begins until compliance is achieved. In cases where the building official has issued a notice of violation, the violation will be deemed to begin, for purposes of determining the number of days of violation, on the date compliance is required by the notice of violation.

R103.6 Enforcement in Municipal Court. Civil actions to enforce this chapter shall be brought exclusively in Seattle Municipal Court, except as otherwise required by law or court rule. In any civil action for a penalty, the City has the burden of proving by a preponderance of the evidence that a violation exists or existed; the issuance of the notice of violation or of an order following a review by the building official is not itself evidence that a violation exists.

R103.7 Judicial review. Because civil actions to enforce Seattle Municipal Code (SMC) Title 22 must be brought exclusively in Seattle Municipal Court pursuant to Section R103.6, orders of the building official including notices of violation issued under this chapter are not subject to judicial review pursuant to Chapter 36.70C RCW.

R103.8 Alternative criminal penalty. Anyone who violates or fails to comply with any notice of violation or order issued by the building official pursuant to this code or who removes, mutilates, destroys or conceals a notice issued or posted by the building official shall, upon conviction thereof, be punished by a fine of not more than $5000 or by imprisonment for not more than 365 days, or by both such fine and imprisonment for each separate violation. Each day's violation shall constitute a separate offense.

R103.9 Additional relief. The building official may seek legal or equitable relief to enjoin any acts or practices and abate any condition when necessary to achieve compliance.

R103.10 Administrative review by the building official. Prior to issuance of the building permit, applicants may request administrative review by the building official of decisions or actions pertaining to the administration and enforcement of this code. Requests shall be addressed to the building official.

R103.11 Administrative review by the Construction Codes Advisory Board. After administrative review by the building official and prior to issuance of the building permit, applicants may request review of decisions or actions pertaining to the application and interpretation of this code by the Construction Codes Advisory Board, except for stop work orders, notices of violations and revocations of permits. The review will be performed by three or more members of the Construction Codes Advisory Board, chosen by the Board Chair. The Chair shall consider the subject of the review and members' expertise when selecting members to conduct a review. The decision of the review panel is advisory only; the final decision is made by the building official.

R103.12 Recording of notices. The building official may record a copy of any order or notice with the Department of Records and Elections of King County.

R103.13 Appeal to Superior Court. Final decisions of the Seattle Municipal Court on enforcement actions authorized by Title 22 may be appealed pursuant to the Rules for Appeal of Decisions of Courts of Limited Jurisdiction.

SECTION R104

ORGANIZATION AND DUTIES

R104.1 Jurisdiction of Department of Construction and Inspections. The Department of Construction and Inspections is authorized to administer and enforce this code. The Department of Construction and Inspections is under the administrative and operational control of the Director, who is the building official.

R104.2 Designees. The building official may appoint such officers, inspectors, assistants and employees as are authorized from time to time. The building official may authorize such employees and other agents as may be necessary to carry out the functions of the building official.

R104.3 Right of entry. With the consent of the owner or occupier of a building or premises, or pursuant to a lawfully issued warrant, the building official may enter a building or premises at any reasonable time to perform the duties imposed by this code.

R104.4 Modifications. The building official may modify the requirements of this code for individual cases provided the building official finds: (1) there are practical difficulties involved in carrying out the provisions of this code; (2) the modification is in conformity with the intent and purpose of this code; and (3) the modification will provide a reasonable level of strength, effectiveness, fire resistance, durability, safety and sanitation when considered together with other safety features of the building or other relevant circumstances. The building official may,

but is not required to, record the approval of modifications and any relevant information in the files of the building official or on the approved construction documents.

R104.5 Alternate materials, methods of construction and design. This code does not prevent the use of any material, design or method of construction not specifically allowed or prohibited by this code, provided the alternate has been approved and its use authorized by the building official. The building official may approve an alternate, provided the building official finds that the proposed alternate complies with the provisions of this code and that the alternate, when considered together with other safety features of the building or other relevant circumstances, will provide at least an equivalent level of strength, effectiveness, fire resistance, durability, safety and sanitation. Certain code alternates have been pre-approved by the building official and are identified in this code as code alternates. The building official may require that sufficient evidence or proof be submitted to reasonably substantiate any claims regarding the use or suitability of the alternate. The building official may, but is not required to, record the approval of code alternates and any relevant information in the files of the building official or on the approved construction documents.

R104.6 Flood hazard areas. The building official shall not approve modifications or code alternates to any provisions required in flood hazard areas identified in Table R301.2(1) unless the building official has determined that any of the following conditions exist:

1. There is good and sufficient cause showing that the unique characteristics of the size, configuration or topography of the site render the elevation standards of Section R322 inappropriate.
2. Failure to approve the modification or code alternate would result in exceptional hardship render the lot undevelopable.

3. The approval of the modification or code alternate will not result in increased flood heights, additional threats to public safety, or additional public expense.

Any modification or code alternate that is approved shall be the minimum necessary to afford relief, considering the flood hazard.

If a modification or code alternate is approved, the building official shall give written notice to the applicant that describes the difference between the design flood elevation and the elevation to which the building is to be built, warns that the cost of flood insurance will be commensurate with the increased risk resulting from the reduced floor elevation, and states that construction below the design flood elevation increases risks to life and property.

R104.7 Tests. Whenever there is insufficient evidence of compliance with any of the provisions of this code or evidence that any material or construction does not conform to the requirements of this code, the building official may require tests as proof of compliance to be made at no expense to the City. Test methods shall be specified by this code or by other recognized test standards. If there are no recognized and accepted test methods for the proposed alternate, the building official shall determine the test procedures. All tests shall be made by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

R104.8 Rules of the building official. The building official has authority to issue interpretations of this code and to adopt and enforce rules and regulations supplemental to this code as may be deemed necessary in order to clarify the application of the provisions of this code. Such interpretations, rules and regulations shall be in conformity with the intent and purpose of this code.

R104.8.1 Procedure. The building official shall promulgate, adopt and issue rules according to the procedures specified in the Administrative Code, Chapter 3.02 of the Seattle Municipal Code.

R104.9 Liability. Nothing in this code is intended to be nor shall be construed to create or form the basis for any liability on the part of the City, or its officers, employees or agents, for any injury or damage resulting from the failure of a building to conform to the provisions of this code, or by reason or as a consequence of any inspection, notice, order, certificate, permission or approval authorized or issued or done in connection with the implementation or enforcement of this code, or by reason of any action or inaction on the part of the City related in any manner to the enforcement of this code by its officers, employees or agents.

This code shall not be construed to relieve or lessen the responsibility of any person owning, operating or controlling any building or structure for any damages to persons or property caused by defects, nor shall the Department of Construction and Inspections or the City of Seattle be held to have assumed any such liability by reason of the inspections authorized by this code or any permits or certificates issued under this code.

R104.10 Responsibilities of parties.

R104.10.1 Responsibility for compliance. Compliance with the requirements of this code is the obligation of the owner of the building, structure, or premises; the duly authorized agent of the owner; and other persons responsible for the condition or work, and not of the City or any of its officers, employees or agents.

R104.10.2 Responsibility of design professional, contractor, plans examiner and inspector. The responsibilities of the design professional in responsible charge, contractor,

plans examiner, and field inspector are as provided in the *International Building Code* Section 104.10.

SECTION R105

BUILDING PERMITS

R105.1 Permits required. Except as otherwise specifically provided in this code, a building permit shall be obtained from the building official for each building or structure prior to erecting, constructing, enlarging, altering, repairing, moving, improving, removing, changing the occupancy of, or demolishing such building or structure, or allowing the same to be done. All work shall comply with this code, even where no permit is required.

R105.2 Work exempt from permit. A building permit is not required for the work listed below. Exemption from the permit requirements of this code does not authorize any work to be done in any manner in violation of this code or any other laws or ordinances of the City.

1. Minor repairs or alterations if the value of construction, as determined by the building official, is $6,000 or less in any six month period. Such repairs and alterations shall not include the removal, reduction, alteration or relocation of any loadbearing support. Egress, light, ventilation and fire-resistance shall not be reduced without a permit.
2. Minor work including the following, provided no changes are made to the building envelope: patio and concrete slabs on grade; painting or cleaning a building; repointing a chimney; installing kitchen cabinets, paneling or other surface finishes over existing wall and ceiling systems; insulating existing buildings; abatement of hazardous materials; and in-kind or similar replacement of or repair of deteriorated members of a structure.
3. One-story detached accessory buildings used for greenhouse, tool or storage shed, playhouse, or similar uses, if:

3.1. The projected roof area does not exceed 120 square feet; and

3.2. The building is not placed on a concrete foundation other than a slab on grade.

4. Fences not over 8 feet high that do not have masonry or concrete elements above 6 feet.

5. Arbors and other open-framed landscape structures not exceeding 120 square feet in projected area.

6. Retaining walls and rockeries which are not over 4 feet in height measured from the bottom of the footing to the top of the wall, if:

6.1. There is no surcharge or impoundment of Class I, II or III-A liquids;

6.2. The wall or rockery is not located in an Environmentally Critical Area (ECA) or ECA buffer pursuant to chapter 25.09 of the Seattle Municipal Code;

6.3. Construction does not support soils in a steep slope area, potential landslide area or known slide area as identified in the Seattle Environmentally Critical Areas Ordinance, Section 25.09.020 of the Seattle Municipal Code.

6.4. Possible failure would likely cause no damage to adjoining property or structures.

7. Platforms, walks and driveways not more than 18 inches above grade and not over any basement or story below.

8. Window awnings supported by an exterior wall when projecting not more than 54 inches.

9. Prefabricated swimming pools, spas and similar equipment accessory to a building subject to this code in which the pool walls are entirely above the adjacent grade and if the capacity does not exceed 5,000 gallons.

10. Replacement of siding. This shall not include structural changes, replacement of sheathing or alteration to doors and windows. See Energy Code Sections ((~~R101.4.3~~)) R503.1.1, Exceptions 2 and 3.

11. Roof recover.

12. Roof replacement if no changes are made to the building envelope other than adding or replacing insulation, and the work is equivalent to or better than the existing structure. Permits are required for structural changes and replacement of sheathing of any size. See Energy Code Sections ((~~R101.4.3~~)) R503.1.1, Exceptions 2 and 3 for insulation requirements for existing buildings.

13. Private playground equipment including tree houses.

14. Removal and/or replacement of underground storage tanks that are subject to regulation by a state or federal agency.

Note: A Fire Department permit is required for removal, replacement and decommissioning of underground storage tanks.

15. Installation of dish and panel antennas 6.56 feet (2 m) or less in diameter or diagonal measurement.

16. Portable heating appliances, portable ventilating equipment and portable cooling units, if the total capacity of these portable appliances does not exceed 40 percent of the cumulative heating, cooling or ventilating requirements of a building or dwelling unit and does not exceed 3 kW or 10,000 Btu input.

17. Any closed system of steam, hot or chilled water piping within heating or cooling equipment regulated by this code.

18. Minor work or the replacement of any component part of a mechanical system that does not alter its original approval and complies with other applicable requirements of this code.

19. Water tanks not located in Environmentally Critical Areas that are supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) the ratio of height to diameter or width is not greater than 2:1.

R105.3 Other permits required. Unless otherwise exempted by this or other pertinent codes, separate master use, plumbing, electrical, mechanical and other permits may be required for the above exempted items.

R105.4 Flood hazard areas. In addition to the permit required by this section, all work to be performed in areas of special flood hazard, as defined in Chapter 25.06 of the Seattle Municipal Code are subject to additional standards and requirements, including floodplain development approval or a Floodplain Development License, as set forth in Chapter 25.06, the Seattle Floodplain Development Ordinance.

R105.5 Application for permit. To obtain a permit, the applicant shall first file an application in a format determined by the building official. Every such application shall:

1. Identify and describe the work to be covered by the permit for which application is made.
2. Describe the land on which the proposed work is to be done by legal description, property address or similar description that will readily identify and definitely locate the proposed building or work.
3. Provide the contractor's business name, address, phone number and current contractor registration number (required if contractor has been selected).
4. Be accompanied by construction documents, including plans and other data required in Section R105.6.

5. State the valuation of any new building or structure or any addition, remodeling or alteration to an existing building, including cost breakdown between additions and alterations.
6. Be signed by the owner of the property or building, or the owner's authorized agent, who may be required to submit evidence to indicate such authority.
7. Give such other data and information as may be required by the building official, including, but not limited to, master use and shoreline permits and building identification plans.
8. State the name of the owner and contractor and the name, address and phone number of a contact person.
9. Substantially conform with applicable city law in effect on the date described in Section R101.3, as modified by any exception.
10. Applications that include a grading component shall include all information prescribed by the Grading Code and rules adopted thereunder, and all additional information required by the building official pursuant to the Grading Code and rules adopted thereunder.

R105.6 Construction documents. Construction documents shall be submitted in two or more sets with each application for a permit, or shall be submitted in electronic format determined by the building official. Computations, stress diagrams, shop and fabrication drawings and other data sufficient to show the adequacy of the plans shall be submitted when required by the building official.

Exception: The building official may waive the submission of construction documents if the building official finds that the nature of the work applied for is such that reviewing of construction documents is not necessary to obtain compliance with this code.

R105.6.1 Preparation by registered design professionals. Construction documents for all work shall be prepared and designed by or under the direct supervision of an architect or structural engineer licensed to practice under the laws of the State of Washington. Each sheet of construction documents shall bear the seal and the signature of the registered design professional before the permit is issued.

Exceptions:

1. When authorized by the building official, construction documents need not be prepared by an engineer or architect licensed by the State of Washington for the following:
    1.1. Detached one- and two-family dwellings.
    1.2. New buildings or structures, and additions, alterations or repairs made to them of wood light-frame construction, if the value of construction, as determined by the building official, is less than $75,000.
    1.3. Nonstructural alterations and repairs if the value of construction, as determined by the building official, is less than $75,000, excluding the value of electrical and mechanical systems, fixtures, equipment, interior finish and millwork.
    1.4. Other work as specified in rules promulgated by the building official.
2. When authorized by the building official, construction documents for assembly line products or designed specialty structural products may be designed by a registered professional engineer.

Interpretation R105.6: Exception 1 does not include buildings with steel moment frames, or extensive or more complex concrete structures such as concrete frame, mild reinforced or

post-tensioned floor slabs. These buildings are required to be designed by a licensed structural engineer.

R105.6.1.1 Design professional in responsible charge. The building official is authorized to require the owner to engage and designate on the building permit application a registered design professional who shall act as the registered design professional in responsible charge. If the circumstances require, the owner shall designate a substitute registered design professional in responsible charge who shall perform the duties required of the original registered design professional in responsible charge. The building official shall be notified in writing by the owner if the registered design professional in responsible charge is changed or is unable to continue to perform the duties. The registered design professional in responsible charge is responsible for reviewing and coordinating submittal documents prepared by others, including phased and deferred submittal items, for compatibility with the design of the building.

R105.6.2 Information required on construction documents. Construction documents shall include the following, as applicable:

1. A plot plan showing the width of streets, alleys, yards and courts.
2. The location (and/or location within a building), floor area, story, height and use defined by the Land Use Code of the proposed building and of every existing building on the property.
3. Where there are more than two buildings located on a property, a building identification plan identifying the location of each building on the property and identifying each building by a numbering system unrelated to address. Such plan is

not required where a plan for the site is already on file and no new buildings are being added to the site.

4. Types of heating and air conditioning systems.
5. Architectural plans, including floor plans, elevations and door and finish schedules showing location of all doors, windows, mechanical equipment, shafts, pipes, vents and ducts.
6. Structural plans, including foundation plan and framing plans.
7. Cross-sections and construction details for both architectural and structural plans, including wall sections, foundation, floor and roof details, connections of structural members and types of construction material.
8. Topographic plans, including original and final contours, location of all buildings and structures on the site and, when required by the building official, adjacent to the site, and cubic yards of cut and fill.
9. If the building official has reason to believe that there may be an intrusion into required open areas or over the property line, a survey of the property prepared by a land surveyor licensed by the State of Washington is required for all new construction, and for additions or accessory buildings.
10. If any building or structure is to be erected or constructed on property abutting an unimproved or partially improved street or alley, the plans shall also include a profile showing the established or proposed grade of the street or alley, based upon information obtained from the Director of Transportation relating to the proposed finished elevations of the property and improvements thereon.

R105.6.3 Information on first sheet. The first or general note sheet of each set of plans shall specify the following, as applicable:

1. The building and street address of the work.
2. The name and address of the owner and person who prepared the plans.
3. Legal description of the property.
4. Type of occupancy of all parts of the building as defined in this code, including notation of fixed fire protection devices or systems.
5. Zoning classification of the property and existing and proposed uses of the structure(s) as defined in the *Land Use Code*.
6. Number of stories and basements as defined in this code.

Variances, conditional uses, special exceptions, including project numbers, approval and approval extension dates.

R105.6.4 Structural notes. Plans shall include applicable information including, but not limited to, the following:

1. Design loads: Snow load, live loads and lateral loads. If required by the building official, the structural notes for plans engineered to ASCE 7 shall include the factors of the base shear formula used in the design;
2. Foundations: Foundation investigations, allowable bearing pressure for spread footings, allowable load capacity of piles, lateral earth pressure;
3. Masonry: Type and strength of units, strength or proportions of mortar and grout, type and strength of reinforcement, method of testing, design strength;
4. Wood: Species or species groups, and grades of sawn lumber, glued-laminated lumber, plywood and assemblies, type of fasteners;

5. Concrete: Design strengths, mix designs, type and strength of reinforcing steel, welding of reinforcing steel, restrictions, if any; and
6. Steel and aluminum: Specification types, grades and strengths, welding electrode types and strengths.

In lieu of detailed structural notes, the building official may approve minor references on the plans to a specific section or part of this code or other ordinances or laws.

R105.6.5 Deferred submittals. Deferral of any submittal items shall have the prior approval of the *building official*. The *registered design professional in responsible charge* shall list *deferred submittals* on the *plans* for review by the *building official*.

Documents for *deferred submittal* items shall be submitted to the *registered design professional in responsible charge* who shall review them and forward them to the *building official* with a notation indicating that the *deferred submittal* documents have been reviewed and been found to be in general conformance to the design of the building. The *deferred submittal* items shall not be installed until the *deferred submittal* documents have been approved by the *building official*.

R105.6.6 Information for construction in flood hazard areas. For buildings and structures located in whole or in part in flood hazard areas identified in Table R301.2(1), *construction documents* shall also include:

1. Delineation of flood hazard areas, floodway boundaries, flood zones, and design flood elevations, as appropriate.
2. The elevation of the proposed lowest floor, including *basement*; and in areas of shallow flooding (AO Zones), the height of the proposed lowest floor, including *basement*, above the highest adjacent *grade*.

3. The elevation of the bottom of the lowest horizontal structural member in coastal high hazard areas (V Zone) and in Coastal A Zones where such zones are delineated on flood hazard maps identified in Table R301.2(1) or otherwise delineated by the jurisdiction.
4. If design flood elevations are not included on the community's Flood Insurance Rate Map (FIRM), the building official and the applicant shall obtain and reasonably utilize any design flood elevation and floodway data available from other sources.

R105.6.7 Construction and Demolition Waste: The information in Sections R105.6.7.1 and R105.6.7.2 shall be submitted for projects generating construction or demolition material for salvage, recycling or disposal:

Exception: Projects for which an emergency order or hazard correction order has been issued pursuant to Section R102.

R105.6.7.1 Application Submittal Requirements. The following information shall be provided at the time of application submittal for *building alterations* and the demolition of *existing buildings* having a work area greater than 750 square feet or a project value greater than $75,000:

1. A salvage assessment completed by an approved agency identifying building components having potential to be salvaged prior to building removal. The building owner is permitted to complete the assessment for building alterations that include some demolition.
2. A statement of compliance with the regulations of the Puget Sound Clean Air Agency regarding asbestos identification, notification, and abatement.

R105.6.7.2 Waste Diversion Report. A Waste Diversion Report shall be submitted within 60 days of final inspection approval. The Waste Diversion Report shall identify the weight or volume of project-generated construction waste and demolition material; the hauler of the material; and the receiving facility or location for each commodity. A signed affidavit from the receiving party and photo documentation shall be included for salvaged materials in which a tip receipt cannot be obtained.

R105.6.8 Clarity of plans. Plans shall be drawn to a clearly indicated and commonly accepted scale in a format determined by the building official.

R105.7 Application review. The construction documents shall be reviewed by the building official. Such construction documents may be reviewed by other departments of the City to check compliance with the laws and ordinances under their jurisdiction.

R105.7.1 Determination of completeness. Within 28 days after an application is filed, the building official shall notify the applicant in writing either that the application is complete or that it is not complete, and if not complete, what additional information is required to make it complete. Within 14 days after receiving the additional information, the building official shall notify the applicant in writing whether the application is now complete or what additional information is necessary. An application shall be deemed to be complete if the building official does not notify the applicant in writing by the deadlines in this section that the application is incomplete.

R105.7.2 Decision on application. Except as provided in Section R105.10, the building official shall approve, condition or deny the application within 120 days after the building official notifies the applicant that the application is complete.

To determine the number of days that have elapsed after the notification that the application is complete, the following periods shall be excluded:

1. All periods of time during which the applicant has been requested by the Director to correct plans, perform required studies, or provide additional required information, until the determination that the request has been satisfied. The period shall be calculated from the date the building official notifies the applicant of the need for additional information until the earlier of the date the building official determines whether the additional information satisfies the request for information or 14 days after the date the information has been provided to the building official.
2. If the building official determines that the information submitted by the applicant under item 1of this subsection is insufficient, the building official shall notify the applicant of the deficiencies, and the procedures under item 1 of this subsection shall apply as if a new request for information had been made;
3. All extensions of time mutually agreed upon by the applicant and the building official.

If a project permit application is substantially revised by the applicant, the time period shall start from the date at which the revised project application is determined to be complete under Section R101.3.1.

R105.7.3 Determination of substantially improved or substantially damaged existing buildings in flood hazard areas. For applications for reconstruction, rehabilitation, *addition*, alteration, repair or other improvement of existing buildings or structures located in a flood hazard area identified in Table R301.2(1), the *building official* shall determine the value of the proposed work. For buildings that have sustained damage of any origin, the value of the

proposed work shall include the cost to repair the building or structure to its predamaged condition, regardless of the actual repair work performed. If the *building official* finds that the value of proposed work equals or exceeds 50 percent of the market value of the building or structure before the damage occurred or the improvement starts, the proposed work constitutes a substantial improvement and the proposed work shall comply with Section R322.

Substantial improvements do not include:

1. Improvements to a building or structure that are required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to ensure safe living conditions, or
2. Any alteration of a landmark, provided that the alteration will not result in rescission of the landmark's landmark designation landmark.

R105.8 Issuance of permit.

R105.8.1 Subject to Section R105.8.2, the building official shall issue a permit to the applicant if the building official finds the following:

1. The work described in the construction documents conforms to the requirements of this code and other pertinent laws, ordinances and regulations and with all conditions imposed under any of them,
2. The fees specified in the Fee Subtitle have been paid, and

3. The applicant has complied with all requirements to be performed prior to issuance of a permit for the work under other pertinent laws, ordinances or regulations or included in a master use permit, or otherwise imposed by the building official.

When the permit is issued, the applicant or the applicant's authorized agent becomes the permit holder.

R105.8.2 The building official shall not issue a permit if the building official has determined that the property owner violated subsection 22.210.136.A of the Seattle Municipal Code and has not obtained any required tenant relocation license.

R105.8.3 Grading permits. The grading component of the building permit is the portion of the building permit that authorizes work that is subject to the requirements of the Grading Code. That component constitutes a grading permit.

R105.8.4 Permit conditions. The building official may impose on a permit any conditions authorized by this code or other pertinent ordinances or regulations, including but not limited to the Grading Code, the Stormwater Code, Regulations for Environmentally Critical Areas, and rules adopted pursuant to those codes. The building official may condition a permit in order to reduce the risks associated with development, construction, ownership and occupancy including, but not limited to risks in potential slide areas.

R105.8.5 Denial of permits. The building official may deny a permit if the building official determines that:

1. The risks cannot be reduced to an acceptable level,
2. The proposed project or construction documents do not conform to the requirements of this code or other pertinent laws, ordinances or regulations, to requirements included in the Master Use Permit or to requirements otherwise imposed by the building official or other City departments, or to requirements otherwise imposed by the building official or other City departments, or

3. The applicant has failed to comply with any requirement or condition imposed pursuant to the authority described in Section R105.8.4.

R105.8.6 Compliance with approved construction documents. When the building official issues a permit, the building official shall endorse the permit in writing or in electronic format and stamp the plans APPROVED. Such approved plans and permit shall not be changed, modified or altered without authorization from the building official, and all work shall be done in accordance with the approved construction documents and permit except as authorized by the building official during a field inspection to correct errors or omissions, or as authorized by Section R105.9.

R105.9 Revisions to the permit. When changes to the approved work are made during construction, approval of the building official shall be obtained prior to execution. The building inspector may approve minor changes to the construction documents for work not reducing the structural strength or fire and life safety of the structure. The building inspector shall determine if it is necessary to revise the approved construction documents. No changes that are subject to special inspection shall be made during construction unless approved by the building official. If revised plans are required, changes shall be submitted to and approved by the building official, accompanied by fees specified in the Fee Subtitle, prior to occupancy. All changes shall conform to the requirements of this code and other pertinent laws and ordinances and other issued permits.

R105.10 Cancellation of permit applications. Applications may be cancelled if no permit is issued by the earlier of the following: (1) twelve months following the date of application; or (2) sixty days from the date of written notice that the permit is ready to issue. After cancellation,

construction documents submitted for review may be returned to the applicant or destroyed by the building official.

The building official will notify the applicant in writing at least 30 days before the application is cancelled. The notice shall specify a date by which a request for extension must be submitted in order to avoid cancellation. The date shall be at least two weeks prior to the date on which the application will be cancelled.

R105.10.1 Extensions prior to permit issuance. At the discretion of the building official, applications for projects that require more than 12 months to review and approve may be extended for a period that provides reasonable time to complete the review and approval, but in no case longer than 24 months from the date of the original application. No application may be extended more than once. After cancellation, the applicant shall submit a new application and pay a new fee to restart the permit process.

Notwithstanding other provisions of this code, an application may be extended where issuance of the permit is delayed by litigation, preparation of environmental impact statements, appeals, strikes or other causes related to the application that are beyond the applicant's control, or while the applicant is making progress toward issuance of a master use permit.

R105.11 Retention of plans. One set of approved plans, which may be on microfilm or in electronic format, shall be retained by the building official. One set of approved plans shall be returned to the applicant and shall be kept at the site of the building or work for use by inspection personnel at all times during which the work authorized is in progress.

R105.12 Validity of permit. The issuance or granting of a permit or approval of construction documents shall:

1. Not be construed to be a permit for, or an approval of, any violation of any of the provisions of this code or other pertinent laws and ordinances;
2. Not prevent the building official from requiring the correction of errors in the construction documents or from preventing building operations being carried on thereunder when in violation of this code or of other pertinent laws and ordinances of the City;
3. Not prevent the building official from requiring correction of conditions found to be in violation of this code or other pertinent laws and ordinances of the City; or
4. Not be construed to extend the period of time for which any such permit is issued or otherwise affect any period of time for compliance specified in any notice or order issued by the building official or other administrative authority requiring the correction of any such conditions.

R105.13 Expiration of permits. Authority to do the work authorized by a permit expires 18 months from the date of issuance. An approved renewal extends the life of the permit for an additional 18 months from the prior expiration date. An approved reestablishment extends the life of the permit for 18 months from the date the permit expired.

Exceptions:

1. Initial permits for major construction projects that require more than 18 months to complete may be issued for a period that provides reasonable time to complete the work, according to an approved construction schedule. The building official may authorize a permit expiration date not to exceed three years from the date of issuance, except when there is an associated Shoreline Substantial Development permit in

which case the building official may authorize an expiration date not to exceed the life of the Shoreline permit.

2. The building official may issue permits which expire in less than 18 months if the building official determines a shorter period is appropriate to complete the work. This section is subject to the limitations in Seattle Municipal Code Section 22.800.100, Seattle Stormwater Code.

R105.14 Renewal of permits. Permits may be renewed and renewed permits may be further renewed by the building official if the following conditions are met:

1. Application for renewal is made within the 30 day period immediately preceding the date of expiration of the permit; and
2. If the project has had an associated discretionary Land Use review, the land use approval has not expired; and
3. If an application for renewal is made more than 18 months after the date of mandatory compliance with a new or revised edition of the *Seattle Residential Code*, the permit shall not be renewed unless:
   - 3.1. The building official determines that the permit complies, or is modified to comply, with the Seattle Residential, Energy, Stormwater, Side Sewer and Grading codes in effect on the date of application for renewal; or
   - 3.2. The work authorized by the permit is substantially underway and progressing at a rate approved by the building official. "Substantially underway" means that normally required building inspections have been approved for work such as foundations, framing, mechanical, insulation and finish work that is being completed on a continuing basis; or

3.3. Commencement or completion of the work authorized by the permit is delayed by litigation, appeals, strikes or other extraordinary circumstances related to the work authorized by the permit beyond the permit holder's control, subject to approval by the building official; and

4. If an application for renewal is submitted on or after January 1, 2017, the permit shall not be renewed unless: (a) the building official determines that the permit complies, or is modified to comply, with the Seattle Stormwater Code in effect on the date of application for renewal; or (b) construction has started. For purposes of this provision, "started construction" means the site work associated with and directly related to the approved project has begun. For example, grading the project site to final grade or utility installation constitutes the start of construction; simply clearing the project site does not.

R105.15 Reestablishment of expired permits. A new permit is required to complete work if a permit has expired and was not renewed.

Exception: A permit that expired less than one year prior to the date of a request for reestablishment may be reestablished upon approval of the building official if it complies with Section R105.14, Items 2, 3 and 4 above. Once re-established the permit will not be considered to have expired. The new expiration date of a reestablished permit shall be determined in accordance with Section R105.13.

R105.16 Revocation of building permits. Whenever the building official determines there are grounds for revoking a permit, the building official may issue a notice of revocation. The notice of revocation shall identify the reason for the proposed revocation, including but not limited to the violations, the conditions violated and any alleged false or misleading information provided.

R105.16.1 Standards for revocation. The building official may revoke a permit if:

1. The code or the building permit has been or is being violated and issuance of a notice of violation or stop work order has been or would be ineffective to secure compliance because of circumstances related to the violation; or
2. The permit was obtained with false or misleading information.

R105.16.2 Service of notice of revocation. The notice of revocation shall be served upon the owner, agent or other responsible person by personal service or regular first class mail addressed to the last known address of such person or if no address is available after reasonable inquiry, the notice may be posted in a conspicuous place on the premises. The notice may also be posted if served by personal service or first class mail.

R105.16.3 Effective date of revocation. The building official shall identify in the notice of revocation a date certain on which the revocation will take effect. This date may be stayed pending complete review by the building official pursuant to Section R105.12.4.

R105.16.4 Review by the building official for notice of revocation. Any person aggrieved by a notice of revocation may obtain a review by making a request in writing to the building official within three business days of the date of service of the notice of revocation. Any person affected by the notice of revocation may submit additional information to the building official for consideration as part of the review at any time prior to the review.

R105.16.4.1 Review procedure. The review will be made by a representative of the building official who will review all additional information received and may also request a site visit. After the review, the building official may:

1. Sustain the notice of revocation and affirm or modify the date the revocation will take effect;

2. Withdraw the notice of revocation;

3. Modify the notice of revocation and affirm or modify the date the revocation will take effect; or

4. Continue the review to a date certain.

R105.16.4.2 Order of revocation of permit. The building official shall issue an order containing the decision within ten days after the review is completed and shall cause the same to be sent by regular first class mail to the person or persons requesting the review, any other person on whom the notice of revocation was served and any other person who requested a copy before issuance of the order. The order of the building official is the final order of the City, and the City and all parties shall be bound by the order.

SECTION R106

INSPECTIONS

R106.1 General. All construction or work for which a permit is required is subject to inspection by the building official, and certain types of construction shall have special inspections by registered special inspectors as specified in the *Seattle Building Code* Chapter 17.

R106.2 Surveys. A survey of the lot may be required by the building official to verify compliance of the structure with approved construction documents.

R106.3 Inspection requests. The owner of the property or the owner's authorized agent, or the person designated by the owner or agent to do the work authorized by a permit shall notify the building official that work requiring inspection as specified in this section is ready for inspection.

R106.4 Access for inspection. The permit holder and the person requesting any inspections required by this code shall provide access to and means for proper inspection of such work, including safety equipment required by the Washington Industrial Safety and Health Agency.

The work shall remain accessible and exposed for inspection purposes until approved by the building official. Neither the building official nor the City is liable for expense entailed in the required removal or replacement of any material to allow inspection.

R106.5 Inspection record. Work requiring a permit shall not be commenced until the permit holder or the permit holder's agent has posted an inspection record in a conspicuous place on the premises and in a position that allows the building official to conveniently make the required entries regarding inspection of the work. This record shall be maintained in such a position by the permit holder or the permit holder's agent until final approval has been granted by the building official.

R106.6 Approvals required. No work shall be done on any part of the building or structure beyond the point indicated in each successive inspection without first obtaining the written approval of the building official. Written approval shall be given only after an inspection has been made of each successive step in the construction as indicated by each of the inspections required in Section R106.8. There shall be a final inspection and approval of all buildings when they are completed and ready for occupancy.

R106.6.1 Effect of approval. Approval as a result of an inspection is not approval of any violation of the provisions of this code or of other pertinent laws and ordinances of the City. Inspections presuming to give authority to violate or cancel the provisions of this code or of other pertinent laws and ordinances of the City are not valid.

R106.7 Concealment of work. No required reinforcing steel or structural framework of any part of a building or structure shall be covered or concealed in any manner whatsoever without first obtaining the approval of the building official.

Exception: Modular homes and commercial coaches identified by State of Washington stickers specified in Section 106.13.4 of the *International Building Code* and placed upon a permanent foundation approved and inspected by the building official.

R106.8 Required inspections. The building official, upon notification by the permit holder or the permit holder's agent, of the property address and permit number, shall make the following inspections and shall either approve that portion of the construction as completed or shall notify the permit holder or the permit holder's agent if the construction fails to comply with the law.

R106.8.1 First ground disturbance inspection. To be made prior to beginning land-disturbing activity, and following installation of erosion control measures and any required fencing that may restrict land disturbance in steep slope or other buffers as defined in chapter 25.09 of the Seattle Municipal Code.

Note: The purpose of the site inspection is to verify the erosion control method, location and proper installation. Approved drainage plan requirements and site plan conditions will also be verified, including buffer delineations.

R106.8.2 Foundation inspection. To be made after trenches are excavated and forms erected and when all materials for the foundation are delivered on the job. Where concrete from a central mixing plant (commonly termed "ready mix") is to be used, materials need not be on the job.

R106.8.3 Concrete slab or under-floor inspection. To be made after all in-slab or under-floor building service equipment, conduit, piping accessories and other ancillary equipment items are in place but before any concrete is poured or floor sheathing installed, including the subfloor.

R106.8.4 Floodplain inspections. For construction in flood hazard areas identified in Table R301.2(1), upon placement of the lowest floor, including *basement*, and prior to further vertical construction, the applicant shall submit documentation, prepared and sealed by a registered *design professional*, showing the elevation of the lowest floor, including *basement*, as required in Section R322.

R106.8.5 Frame inspection. To be made after the roof, all framing, fireblocking and bracing are in place and all pipes, chimneys and vents are complete and the rough electrical, plumbing and heating wires, pipes and ducts are approved.

R106.8.6 Insulation inspection. To be made after all insulation and vapor barriers are in place but before any gypsum board or plaster is applied.

R106.8.7 Lath and/or gypsum board inspection. For shear walls, to be made after lathing and/or gypsum board, interior and exterior, is in place, but before any plastering is applied or before gypsum board joints and fasteners are taped and finished.

R106.8.8 Final site inspection. To be made after all grading is complete, and all **permanent erosion controls, stormwater facilities and stormwater best management practices** have been installed.

Exception: A final site inspection is not required for projects with less than 750 square feet of land disturbing activity.

R106.8.9 Final inspection. To be made after finish grading and the building is completed and before occupancy.

R106.8.9.1 Elevation documentation. If located in a flood hazard area, the documentation of elevations required in Section R322.1.10 shall be submitted to the *building official* prior to the final inspection.

R106.9 Special inspection. Special inspection shall be provided in accordance with International Building Code Chapter 17.

R106.10 Other inspections. In addition to the inspections specified above, the building official may make or require any other inspections of any construction work or site work to ascertain compliance with the provisions of this code and other pertinent laws and ordinances that are enforced by the building official.

R106.11 Special investigation. If work that requires a permit or approval is commenced or performed prior to making formal application and receiving the building official's permission to proceed, the building official may make a special investigation inspection before a permit is issued for such work. Where a special investigation is made, a special investigation fee may be assessed in accordance with the Fee Subtitle.

R106.12 Reinspections. The building official may require a reinspection if work for which an inspection is called is not complete, required corrections are not made, the inspection record is not properly posted on the work site, the approved plans are not readily available to the inspector, access is not provided on the date for which inspection is requested, or if deviations from construction documents that require the approval of the building official have been made without proper approval, or as otherwise required by the building official.

R106.12.1 Compliance with Section R107.3. For the purpose of determining compliance with Section R107.3, Maintenance, the building official or the fire chief may cause a structure to be reinspected.

R106.12.2 Reinspection fee. The building official may assess a reinspection fee as set forth in the Fee Subtitle for any action for which reinspection is required. In instances where

reinspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

R106.13 Approval for occupancy. Except for alterations and additions, no building or structure subject to this code shall be occupied until approved for occupancy after final inspection.

R106.13.1 Effect of Final inspection. Final inspection is not an approval of any violation of the provisions of this code or other pertinent laws and ordinances of the City. Certificates presuming to give authority to violate or cancel the provisions of this code or of other pertinent laws and ordinances of the City are not valid.

SECTION R107

EXISTING STRUCTURES AND EQUIPMENT

R107.1 General. Buildings in existence at the time of the passage of this code that were legally constructed and occupied in accordance with the provisions of a prior code may continue their existing use, if such use is not unsafe. Mechanical systems lawful at the time of the adoption of this code may continue and may be maintained or repaired, converted to another type of fuel or have components replaced if it is done in accordance with the basic original design and location and no hazard to life, health or property is created by such mechanical system.

R107.2 Establishing existing uses for the record. In order to establish an existing use for the record, the building shall comply with the fire and life safety requirements of this code or the code effective at the time the building was constructed. If the existing use is other than that for which the building was constructed, the building shall comply with this code or the code effective at the time the existing use was legally established.

R107.3 Maintenance. All buildings and structures, and all parts thereof, shall be maintained in a safe and sanitary condition. All mechanical systems, materials, equipment and appurtenances and

all parts thereof shall be maintained in proper operating condition in accordance with the original design and in a safe and hazard-free condition. All devices and safeguards which are or were required by a code in effect when the building or structure was erected, altered or repaired shall be maintained in conformance with the code edition under which installed.

Exception: The building official is authorized to modify the requirements of this subsection where all or a portion of a building is unoccupied, closed off and reasonably secure from unlawful entry.

R107.3.1 Reinspection for maintenance. To determine compliance with this subsection, the building official may cause a mechanical system or equipment to be reinspected.

R107.3.2 Responsibility for maintenance. The owner or the owner's designated agent is responsible for maintenance of buildings, structures, mechanical systems, materials, equipment, devices, safeguards and appurtenances. It is a violation to fail to maintain such buildings, structures, mechanical systems, materials, equipment, devices, safeguards and appurtenances or to fail to immediately comply with any lawful notice or order of the building official.

Exception: Occupants of dwellings are responsible for the maintenance of smoke alarms required by Section R314 and carbon monoxide alarms required by Section R315.

R107.4 Unsafe building appendages. Parapet walls, cornices, chimneys and other appendages or structural members that are supported by, attached to, or a part of a building and that are in a deteriorated condition or are otherwise unable to sustain the design loads specified in this code, are hereby designated as unsafe building appendages. All such unsafe building appendages are public nuisances and shall be abated in accordance with Section R102.

R107.5 Additions and alterations. Buildings and structures to which additions and alterations are made shall comply with all the requirements of this code for new facilities except as specifically provided in this section. *Alterations* shall be such that the *existing building* or structure is no less conforming to the provisions of this code after the alteration than the *existing building* or structure was before the *alteration*.

See also applicable provisions of the *International Energy Conservation Code*. Any building or addition that is not covered by or within the scope of this code as provided in Section R101.2 shall be designed to the provisions of the *International Building Code*.

Exceptions:

1. An addition may be made to an existing nonconforming building if the following conditions are met:
    1.1. A fire wall, constructed in compliance with *International Building Code* Section 706, separates the addition and the existing structure;
    1.2. The existing building is not made more nonconforming; and
    1.3. The addition conforms to this code.
2. Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for whole house ventilation systems, Section M1507.

R107.5.1 When allowed. Additions and alterations may be made to any existing building or structure without requiring the existing building or structure to comply with all the requirements of this code, if the addition or alteration conforms to the standards required for a new building or structure and complies with Section R107.5. Additions, alterations or renovations may be made to any mechanical system without requiring the existing mechanical system to comply with all the requirements of this code, if the addition, alteration

or renovation conforms to the standards required for a new mechanical system. Additions, alterations or renovations shall not cause an existing system to become unsafe, unhealthy or overloaded. Minor additions, alterations and renovations to existing mechanical systems may be installed in accordance with the law in effect at the time the original installation was made, if approved by the building official.

R107.5.2 Impracticality. In cases where compliance with the requirements of this code is impractical, the applicant may arrange a presubmittal conference with the design team and the building official. The applicant shall identify alternate design solutions and modifications and demonstrate conformance to Section R104.4 or R104.5. The building official is authorized to waive specific requirements in this code that the building official determines to be impractical.

R107.5.3 Compliance with retroactive ordinances. Alterations and repairs to existing buildings that are being made in response to a notice or order requiring compliance with the *Housing and Building Maintenance Code*, Subtitle II, Title 22 of the Seattle Municipal Code, the *Fire Code*, Subtitle VI, Title 22 of the Seattle Municipal Code, or other ordinances applicable to existing buildings, shall be permitted to be made in accordance with the standards contained in those ordinances rather than the standards for new buildings contained in this code. If standards are not specified in those ordinances, such alterations or repairs shall conform to the requirements of this chapter.

R107.5.4 Nonstructural alterations. Alterations that are nonstructural and that do not affect any member or part of the building or structure required to be fire resistant may be made with the same materials of which the building or structure is constructed, provided that no change is permitted that increases its hazard.

R107.5.5 Maintenance of structural stability. If approved by the building official, minor structural alterations necessary to maintain the structural stability of the building may be made with the same material of which the building or structure is constructed.

R107.6 Repairs. Repairs to existing structures or equipment shall comply with the International Existing Buildings Code.

Exception: *Repair* of buildings with *damage ratios* of 60 percent or more shall comply with Section R107.9.

R107.7 Landmarks--Historic buildings and structures. The building official may modify the specific requirements of this code as it applies to landmarks, and require in lieu thereof alternate requirements that, in the opinion of the building official, will result in a reasonable degree of safety to the public and the occupants of those buildings.

Exception: *Repair* of buildings with *damage ratios* of 60 percent or more shall comply with Section R107.9.

R107.8 Unreinforced masonry chimneys. If an unreinforced masonry chimney is altered or if the building in which such a chimney is located undergoes substantial alteration as defined in Section R107.9.1, the chimney shall be altered to conform to rules promulgated by the building official.

R107.9 Substantial alterations or repairs. Any building or structure to which substantial alterations or repairs are made shall conform to the requirements of this Section and Sections

R310 (emergency escape and rescue openings), R311 (means of egress), R314 (smoke alarms), R315 (carbon monoxide alarms) and R302.2–R302.4 (dwelling unit separation).

R107.9.1 Definition. For the purpose of this section, substantial alterations or repairs may mean any one of the following, as determined by the building official:

1. Repair of buildings with *damage ratios* of 60 percent or more.
2. Remodeling or additions that substantially extend the useful physical and/or economic life of the building or a significant portion of the building.
3. Change to a use within the scope of this code from a use not within the scope of this code.
4. Change from an accessory structure to any other use within the scope of this code.
5. Change from a detached one- or two-family dwelling to a townhouse.
6. Change to adult family home or family child day care home from any other use.

R107.9.2 Seismic regulations. Buildings or structures to which substantial alterations or repairs are made shall comply with Sections R301.1.3 or Sections R403.1.6, R602.10 and R602.11. In addition, the building official may require testing of existing materials, at applicant or property owner's expense, if there is insufficient evidence of structural strength or integrity of the building or structure.

Exception: In lieu of compliance with the seismic provisions of Sections R403.1.6, R602.10 and R602.11, if approved by the building official, the applicant may evaluate and strengthen portions of the building lateral support structure, such as foundations and cripple walls.

R107.9.3 Other structural work. All other structural work shall comply with the requirements of Chapters 3, 4, 5, 6, 8 and 10 of this code.

R107.10 Change of use. If the use of a building or portion thereof is changed, any elements of the dwelling unit envelope that are altered shall comply with the sound transmission control requirements of Section R331. If the use of a building or portion thereof is changed to adult family home or to family home child care, the building shall comply with the applicable provisions of Section R327 or R328.

R107.11 Moved buildings. Residential buildings or structures moved into or within the City are not required to comply with the requirements of this code if the original use classification of the building or structure is not changed. Compliance with the requirements of this chapter is required if the moved residential buildings or structures undergo substantial alteration as defined in R107.9.1. Work performed on new and existing foundations shall comply with all of the requirements of this code for new construction.

SECTION R108

FEES

R108.1 Fees. A fee for each permit and for other activities related to the enforcement of this code shall be paid as set forth in the Fee Subtitle.

Section 3. The following sections of Chapter 2 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 2

DEFINITIONS

SECTION R201

GENERAL

* * *

R201.5 References to other codes. Whenever an International, National or Uniform Code is referenced in this code, it shall mean the Seattle edition of that code, including any local amendments. References to the "Building Code," "Fire Code," "Mechanical Code" and "Plumbing Code" mean the Seattle editions of those codes.

SECTION R202

DEFINITIONS

* * *

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

* * *

[W][RB] ATTIC, HABITABLE. A ((~~finished or unfinished~~)) conditioned area ((~~, not considered a *story*,~~)) complying with all of the following requirements:

1. The occupiable floor area is not less than 70 square feet (((~~17~~)) 6.5 m^2), in accordance with Section R304.
2. The occupiable floor area has a ceiling height in accordance with Section R305.
3. The occupiable space is entirely enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.

A habitable attic is not considered a story.

Interpretation: Item 3 does not include dormers, but may include gable ends. Knee walls are inside the structural envelope.

* * *

BOILER. A closed vessel in which water is heated, steam is generated, steam is superheated, or any combination thereof, under pressure or vacuum by the direct application of heat. The term "boiler" shall also include fired units for heating or vaporizing liquids other than water where these systems are complete within themselves. **((**~~A self-contained *appliance* from which hot water is circulated for heating purposes and then returned to the boiler, and that operates at water pressures not exceeding 160 pounds per square inch gage (psig) (1102 kPa gauge) and at water temperatures not exceeding 250°F (121°C).~~))

* * *

[RB] BUILDING, EXISTING. Existing building is a building erected prior to the adoption of this code, or one ((~~for which a legal building *permit* has been issued~~)) that has passed a final inspection.

* * *

[RB] BUILDING OFFICIAL. The ((~~officer or other designated authority charged with the administration and enforcement of this code~~)) Director of the Seattle Department of Construction and Inspections.

* * *

[W] 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 twelve or fewer children, including children who reside at the home.

[W] CHILD DAY CARE. The care of children during any period of a 24 hour day.

* * *

[W][RE] CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly or indirectly heated or cooled ((~~or that is 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.

* * *

DAMAGE RATIO. The ratio between the cost of work and the estimated replacement cost of the building, expressed as a percentage. The work includes repair of damage to structural and fire/life safety systems.

* * *

[W][RB] 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 and 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 m^2).
3. One accessory dwelling unit, which need not be considered a separated dwelling unit, provided:
   3.1. The accessory dwelling unit is constructed within an existing dwelling unit.

3.2. Either the accessory dwelling unit or the primary dwelling unit is owner-occupied.

3.3. 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.

Interpretation: Accessory dwelling units that do not comply with Item 3 shall be regulated as duplexes.

* * *

[W][RB] FIRE SEPARATION DISTANCE. The distance measured from the ((~~building~~)) 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~~)) opposite side 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 face of~~)) the wall.

* * *

FLOATING HOME. A single-family dwelling constructed to float, which is moored, anchored or otherwise secured in waters. A floating home is not a vessel, even though it may be capable of being towed, and is not a "floating on water residence" as defined in the Seattle Municipal Code Title 23.

FLOATING HOME MOORAGE. A waterfront facility for the moorage of one or more floating homes and the land and water premises on which it is located.

FLOATING HOME SITE. A part of a floating home moorage, located over water, and designed to accommodate one floating home.

* * *

GARBAGE. All discarded putrescible waste matter, including small dead animals weighing not over 15 pounds (6.8 kg), but not including sewage or human or animal excrement.

* * *

[RB] HISTORIC BUILDING. See "LANDMARK". **((**~~Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.~~))**

* * *

[RB] JURISDICTION. The ((~~governmental unit that has adopted this code under due legislative authority~~)) city of Seattle.

* * *

LAND-DISTURBING ACTIVITY. Any activity that results in a movement of earth, or a change in the existing soil cover, both vegetative and nonvegetative, or the existing topography. Land-disturbing activities include, but are not limited to, clearing, grading, filling, excavation or addition of new or the replacement of impervious surface. Compaction, excluding hot asphalt mix, that is associated with stabilization of structures and road construction shall also be considered a land-disturbing activity. Vegetation maintenance practices are not considered land-disturbing activities.

LANDMARK. A building or structure that is subject to a requirement to obtain a certificate of approval from the City Landmarks Preservation Board before altering or making significant changes to specific features or characteristics, that has been nominated for designation and the City Landmarks Preservation Board has not issued a determination regarding designation, that has been designated for preservation by the City Landmarks Preservation Board, that has been designated for preservation by the State of Washington, that has been listed or determined

eligible to be listed in the National Register of Historic Places, or that is located in a landmark or special review district subject to a requirement to obtain a certificate of approval before making a change to the external appearance of a structure.

* * *

[RB] PERSON. Any individual, receiver, administrator, executor, trustee in bankruptcy, trust, estate ((~~heirs, executors, administrators or assigns, and a~~)) firm, partnership , joint venture, club, company, joint stock company, business trust, municipal corporation, political subdivision of the State of Washington, the State of Washington and any instrumentality thereof, ((~~or~~)) corporation, limited liability company, association, society or any group of individuals acting as a unit, whether mutual, cooperative, fraternal, nonprofit or otherwise, and the United States or any instrumentality thereof ((~~its or their successors or assigns, or the agent of any of the aforesaid~~)).

* * *

SEWAGE. ((~~Any liquid waste containing animal matter, vegetable matter or other impurity in suspension or solution.~~)) All water-carried waste discharged from the sanitary facilities of buildings occupied or used by people.

* * *

[W] 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.

* * *

[RB] STORY ABOVE GRADE PLANE. Any *story* having its finished floor surface entirely above *grade plane,* or in which the finished surface of the floor next above is either of the following:

1. More than 6 feet (1829 mm) *above grade plane.*
2. More than 12 feet (3658 mm) above the finished ground level at any point; or
3. More than 12 feet (3658 mm) above the finished ground level for more than 25 feet (7620 mm) of the perimeter. Required driveways up to 22 feet (6706 mm) shall not be considered in calculating the 25 foot distance if there is at least 10 feet (3048 mm) between the driveway and all portions of the 25-foot area. See Figure R202S.

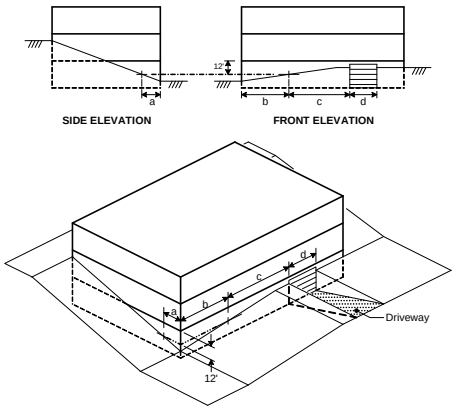

Figure R202S
Story Above Grade Plane

a + b ≤ 25'	Lowest level may be a basement below grade if all these are met
c ≥ 10'	
d ≤ 22'	

* * *

UNSAFE. Structurally unsound, provided with inadequate egress, constituting a fire hazard, or otherwise dangerous to human life, or constituting a hazard to safety, health, or public welfare.

* * *

WATER HEATER. Any heating *appliance* or *equipment* that heats potable water and supplies such water to the potable hot water distribution system, and includes only those appliances that do not exceed pressure of 160 pounds per square inch (1103 kPa), volume of 120 gallons (454 L) and a heat input of 200,000 Btu/hr (58.6 kW). Appliances and equipment that exceed these values are classified as boilers.

* * *

[W]WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. A mechanical ventilation system, including fans, controls, and ducts, which replaces, by direct or indirect means, air from the habitable rooms with outdoor air. ((~~An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate. For definition applicable in Chapter 11, see Section N1101.6.~~))

* * *

Section 4. The following sections of Chapter 3 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 3

BUILDING PLANNING

SECTION R301

DESIGN CRITERIA

* * *

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~~)) are established ((~~by the local *jurisdiction* and set forth~~)) in Table R301.2(1).

* * *

Kathleen Petrie
SDCI 2015 Residential Code ORD
D1b

TABLE R301.2(1)
CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA

	WIND DESIGN					SUBJECT TO DAMAGE FROM							
((~~GROUND~~)) ROOF SNOW LOAD	Speed[d] (mph)	Topographic effects[k]	Special wind region[l]	Wind-borne debris zone[m]	SEISMIC DESIGN CATEGORY[f]	Weathering[a]	Frost line depth[b]	Termite[c]	WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
25 psf	85	No	No	No	D_2	Moderate	12"	none to slight	24° F	No	(a) 1989 (b) May 16, 1995	250	52.8° F

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Weathering may require a higher strength concrete or *grade* of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(3). The *grade* of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

b. The frost line depth may require deeper footings than indicated in Figure R403.1(1). The *jurisdiction* shall fill in the frost line depth column with the minimum depth of footing below finish *grade*.

c. The *jurisdiction* shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.

d. The *jurisdiction* shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

e. ((~~The outdoor design dry-bulb temperature shall be selected from the columns of 97½ percent values for winter from Appendix D of the *International Plumbing Code*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the *building official*.~~)) The winter design temperature is taken from the *International Energy Conservation Code*.

f. The *jurisdiction* shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.

g. The *jurisdiction* shall fill in this part of the table with (a) the date of the *jurisdiction's* entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study ((~~and (c) the panel numbers and dates of the currently effective FIRMs and FBFMs or other flood hazard map adopted by the authority having *jurisdiction*, as amended~~)). Flood hazard areas include areas mapped by Seattle Public Utilities.

h. In accordance with Sections R905.1.2, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the *jurisdiction* shall fill in this part of the table with "YES." Otherwise, the *jurisdiction* shall fill in this part of the table with "NO."

i. The *jurisdiction* shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."

j. The *jurisdiction* shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32°F)."

* * *

[W]TABLE R301.5

MINIMUM UNIFORMLY DISTRIBUTED LIVE LOADS

(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics without storage[b]	10
Uninhabitable attics with limited storage[b, g]	20
Habitable attics and attics served with fixed stairs	30
Balconies (exterior) and decks[e]	((~~40~~)) 60
Fire escapes	40
Guards and handrails[d]	200[h]
Guard in-fill components[f]	50 [h]
Passenger vehicle garages[a]	50 [a]
Rooms other than sleeping rooms	40
Sleeping rooms	30
Stairs	40[c]

For SI: 1 pound per square foot = 0.0479 kPa, 1 square inch = 645 mm^2,

1 pound = 4.45 N.

a. Elevated garage floors shall be capable of supporting a 2,000-pound load applied over a 20-square-inch area.

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 designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.

d. A single concentrated load applied in any direction at any point along the top.

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 not greater than 42 inches, 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:

1. The *attic* area is accessible 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.
2. The slopes of the joists or truss bottom chords are not greater than 2 inches vertical to 12 units horizontal.
3. 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 safety factor of 4. The safety factor shall be applied to each of the concentrated loads applied to the top of the rail, and to the load on the infill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.

* * *

SECTION R302

FIRE-RESISTANT CONSTRUCTION

[W]R302.1 Exterior walls. Construction, projections, openings and penetrations of *exterior walls* of *dwellings* and accessory buildings shall comply with Table R302.1(1); or *dwellings* equipped throughout with an *automatic sprinkler system* installed in accordance with Section P2904 shall comply with Table R302.1(2).

Exceptions:

1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the *fire separation distance*.
2. Walls of *dwellings* and *accessory structures* located on the same *lot*.
3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits by Section R105.2 are not required to provide ((~~wall~~)) protection based on location on the *lot*. Projections beyond the *exterior wall* shall not extend over the *lot line*.
4. Detached garages accessory to a *dwelling* located within 2 feet (610 mm) of a *lot line* are permitted to have roof eave projections not exceeding 4 inches (102 mm).
5. Foundation vents installed in compliance with this code are permitted.

Interpretation R302.1: For purposes of Section R302.1, gutters 6 inches (152 mm) or less in width that are not an integral part of the structure are not considered projections.

[W]R302.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by one of the following methods:

1. A common 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 and a fire sprinkler system in accordance with Section P2904 in both townhouses shall be provided. The cavity of the common wall shall not contain plumbing or mechanical equipment, ducts or vents. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

2. A common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 shall be provided. The cavity of the common wall shall not contain plumbing or mechanical equipment, ducts or vents. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.

3. Two wall assemblies meeting the requirements of Section R302.1 for exterior walls shall be provided.

((~~Common walls separating *townhouses* shall be assigned a fire-resistance rating in accordance with Section R302.2, Item 1 or 2. The common wall shared by two *townhouses* shall be constructed without plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be in accordance with Chapters 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4.~~

~~1. Where a fire 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 E 119 or UL 263.~~

~~2. Where a fire 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 E 119 or UL 263.~~))

TABLE R302.1(1)
EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	< 5 feet
	Not fire-resistance rated	0 hours	≥5 feet
Projections	Not allowed	N/A	< 2 feet
	Fire-resistance rated	1 hour on the underside[a, b]	≥ 2 feet to < 5 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Openings in walls	Not allowed	N/A	< 3 feet
	25% maximum of wall area	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet

For SI: 1 foot = 304.8 mm.
N/A = Not Applicable.

a. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave if fireblocking is provided from the wall top plate to the underside of the roof sheathing.
b. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave provided that gable vent openings are not installed.

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

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E 119 or UL 263 with exposure from the outside	0 feet
	Not fire-resistance rated	0 hours	3 feet[a]
Projections	Not allowed	N/A	< 2 feet
	Fire-resistance rated	1 hour on the underside[b, c]	2 feet[a]
	Not fire-resistance rated	0 hours	3 feet
Openings in walls	Not allowed	N/A	< 3 feet
	Unlimited	0 hours	3 feet[a]
Penetrations	All	Comply with Section R302.4	< 3 feet
		None required	3 feet[a]

For SI: 1 foot = 304.8 mm.
N/A = Not Applicable

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 nonrated exterior walls and 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 roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave if fireblocking is provided from the wall top plate to the underside of the roof sheathing.

c. The roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave provided that gable vent openings are not installed.

⇨ **[W]R302.2.1 Continuity.** The fire-resistance-rated wall or assembly separating *townhouses* 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)).

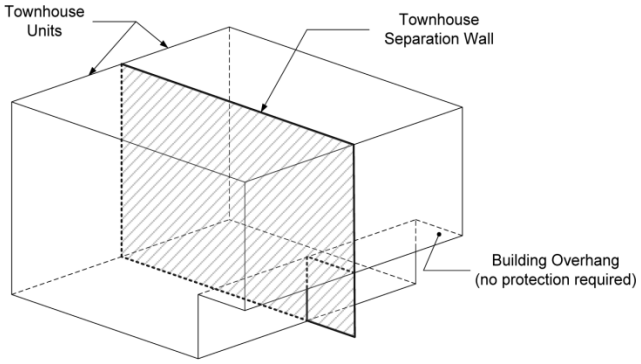

FIGURE R302.2(1)
EXTENDED TOWNHOUSE SEPARATION WALL

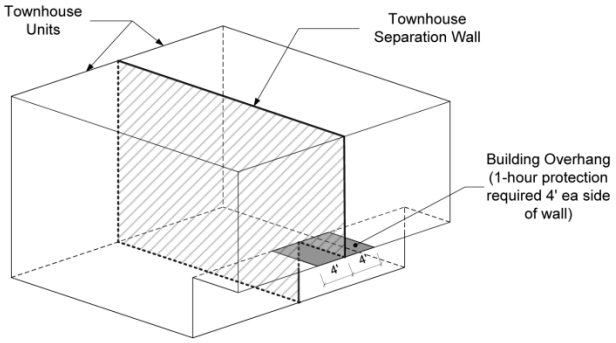

FIGURE R302.2(2)
TOWNHOUSE SEPARATION OVERHANG PROTECTION

R302.2.2 Parapets for townhouses. Parapets constructed in accordance with Section R302.2.3 shall be constructed for *townhouses* as an extension of exterior walls or common walls 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 E 108 or UL 790 and the roof decking or sheathing is of noncombustible materials or *approved* 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.

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.

R302.2.3 Parapet construction. Parapets shall have the same fire-resistance rating as that required for the supporting wall or walls. On any side adjacent to a roof surface, the parapet shall have noncombustible faces for the uppermost 18 inches (457 mm), to include counterflashing and coping materials. Where the roof slopes toward a parapet at slopes greater than 2 units vertical in 12 units horizontal (16.7-percent slope), the parapet shall

extend to the same height as any portion of the roof within a distance of 3 feet (914 mm), and the height shall be not less than 30 inches (762 mm).

[W]R302.2.4 Structural independence. Each individual *townhouse* shall be structurally independent.

Exceptions:

1. Foundations supporting *exterior walls* or common walls.
2. Structural roof and wall sheathing from each unit may be fastened to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.
5. *Townhouses* separated by a common wall as provided in Section R302.2, Item 1 or 2.
6. Floor sheathing may fasten to the floor framing of both units.

R302.3 Two-family dwellings. *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 E 119 or UL 263. 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.

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 NFPA 13.
2. 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.

[W]R302.3.1 Supporting construction. Where floor 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.

Exception: The supporting construction is not required to be fire-resistance rated where automatic fire sprinklers are installed in accordance with Section P2904 in both dwelling units.

* * *

[W]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 Section P2904, 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 where complying with the following:

3.1. The aggregate area of the unprotected portions does not exceed 80 square feet (7.4 m^2) per story.

3.2. Fireblocking 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 dimensional 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.

R302.14 Combustible insulation clearance. Combustible insulation shall be separated not less than 3 inches (76 mm) from recessed luminaires, fan motors and other heat-producing devices.

Exception: Where heat-producing devices are *listed* for lesser clearances, combustible insulation complying with the listing requirements shall be separated in accordance with the conditions stipulated in the listing.

Recessed luminaires installed in the *building thermal envelope* shall meet the requirements of ((~~Section N1102.4.5 of this code~~)) the *International Energy Conservation Code*.

SECTION R303

LIGHT, VENTILATION AND HEATING

[W]R303.1((~~Habitable rooms~~)) Natural light. All ((~~H~~)) habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. ((~~Natural *ventilation* shall be through windows, skylights, doors, louvers or other *approved* openings to the~~

~~outdoor air. Such openings shall be provided with ready access or shall otherwise be readily controllable by the building occupants. The openable area to the outdoors shall be not less than 4 percent of the floor area being ventilated.~~))

Exception((s)):

((~~1. The glazed areas need not be openable where the opening is not required by Section R310 and a whole-house mechanical *ventilation* system is installed in accordance with Section M1507.~~

~~2.~~)) The glazed areas need not be installed in rooms where ((~~Exception 1 is satisfied and~~)) artificial light is provided that is 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.

((~~3. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening~~.))

[W]R303.2 Adjoining rooms. For the purpose of determining light ((~~and *ventilation*~~)) requirements, any room shall be considered to be a portion of an adjoining room where not less than 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 and not less than 25 square feet (2.3 m^2).

Exception: Openings required for light ((~~or *ventilation*~~)) shall be permitted to open into a sunroom with thermal isolation or a patio cover, provided that there is an openable area between the adjoining room and the sunroom or patio cover of not less than one-tenth of the

floor area of the interior room and not less than 20 square feet (2 m^2). ((~~The minimum openable area to the outdoors shall be based upon the total floor area being ventilated.~~))

[W]((~~R303.3 Bathrooms.~~ ~~Bathrooms, water closet compartments and other similar rooms shall be provided with aggregate glazing area in windows of not less than 3 square feet (0.3 m^2), one-half of which must be openable.~~

~~**Exception:** The glazed areas shall not be required where artificial light and a local exhaust system are provided. The minimum local exhaust rates shall be determined in accordance with Section M1507. Exhaust air from the space shall be exhausted directly to the outdoors.~~))

[W] ((~~R303.4 Mechanical ventilation.~~ ~~Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour where tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section N1102.4.1.2, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.~~))

[W]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 M1507.

Exception: Additions with less than 500 square feet of conditioned floor area are exempt from the requirements for *whole house mechanical ventilation systems*.

R303.5 Opening location. Outdoor intake and exhaust openings shall be located in accordance with Sections R303.5.1 and R303.5.2.

[W]R303.5.1 Intake openings. Mechanical and gravity outdoor air intake openings shall be located not less than 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.

[W]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 ductwork.

[W] 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.

R303.6 Outside opening protection. Air exhaust and intake openings that terminate outdoors shall be protected with corrosion-resistant screens, louvers or grilles having an opening size of not less than 1/4 inch (6 mm) and a maximum opening size of 1/2 inch (13 mm), in any dimension. Openings shall be protected against local weather conditions. Outdoor air exhaust and intake openings shall meet the provisions for *exterior wall* opening protectives in accordance with this code.

[W]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

power from the building wiring. The light source shall be capable of illuminating treads and landings to levels of not less than 1 foot-candle (11 lux) as 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.

[W]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 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.

* * *

R303.10 Required heating. ((~~Where the winter design temperature in Table R301.2(1) is below 60°F (16°C), every~~)) Every *dwelling unit* shall be provided with heating facilities capable of maintaining a minimum room temperature of not less than 68°F (20°C) at a point 3 feet (914 mm) above the floor and 2 feet (610 mm) from exterior walls in habitable rooms, baths and toilet rooms at the design temperature as specified in Table R301.2(1). The installation of one or more portable space heaters shall not be used to achieve compliance with this section.

Interpretation R303.10: Accessory *dwelling units* shall be provided with heating controls separate from the primary dwelling unit.

Exception: Unheated recreational tents or yurts not exceeding 500 square feet provided they are not occupied as a permanent dwelling.

[W] R303.10.1 Definitions. For the purposes of this section only, the following definitions apply.

DESIGNATED AREAS. 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. 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.

[W] 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.

[W] 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 United States Environmental Protection Agency certified or exempt from certification by the United States Environmental Protection Agency and conforms with RCW 70.94.011, 70.94.450, 70.94.453 and 70.94.457.

Exceptions:

1. Wood cook stoves.

2. Antique wood heaters manufactured prior to 1940.

* * *

SECTION R307

TOILET, BATH AND SHOWER SPACES

[W]R307.1 Space required. Fixtures shall be spaced in accordance with Figure R307.1, and in accordance with the requirements of ((~~Section P2705.1~~)) *Uniform Plumbing Code* Section 402.5.

* * *

SECTION R308

GLAZING

* * *

R308.4.4 Glazing in guards and railings. Glazing in *guards* and railings, including structural baluster panels and nonstructural in-fill panels, regardless of area or height above a walking surface shall be considered to be a hazardous location.

[W] R308.4.4.1 Structural glass baluster panels. Guards with structural glass baluster panels shall be installed with an attached top rail or handrail. The top rail or handrail shall be supported by a minimum of three glass baluster panels, or shall be otherwise supported to remain in place should one glass baluster panel fail.

Exception: An attached top rail or handrail is not required where the glass baluster panels are laminated glass with two or more glass plies of equal thickness and of the same glass type.

* * *

SECTION R309

GARAGES AND CARPORTS

* * *

((~~**R309.5 Fire sprinklers.** Private garages shall be protected by fire sprinklers where the garage wall has been designed based on Table R302.1(2), Footnote a. Sprinklers in garages shall be connected to an automatic sprinkler system that complies with Section P2904. Garage sprinklers~~

~~shall be residential sprinklers or quick-response sprinklers, designed to provide a density of 0.05 gpm/ft^2. Garage doors shall not be considered obstructions with respect to sprinkler placement.~~))

* * *

SECTION R311

MEANS OF EGRESS

* * *

[W]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: Stairs or ladders inside an individual *dwelling unit* used for access to areas of 200 square feet (18.6 m^2) or less, and not containing the primary bathroom or kitchen.

* * *

SECTION R313

AUTOMATIC FIRE SPRINKLER SYSTEMS

R313.1 ((~~Townhouse a~~)) Automatic fire sprinkler systems. ((~~An automatic residential fire sprinkler system shall be installed in *townhouses*~~)) Where installed, the design and installation of residential fire sprinkler systems shall be in accordance with Section P2904.

((~~Exception:~~ ~~An automatic residential fire sprinkler system shall not be required where *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~

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

((~~**R313.2 One- and two-family dwellings automatic fire systems.** An automatic residential fire sprinkler system shall be installed in one- and two-family *dwellings*.~~

~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~))

SECTION R314

SMOKE ALARMS

* * *

R314.2 Where required. Smoke alarms shall be provided in accordance with this section.

R314.2.1 New construction. Smoke alarms shall be provided in *dwelling units*.

[W] 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*, the individual *dwelling unit* shall be equipped with smoke alarms ((~~located~~)) 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.

[W]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* and 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 *family home child care*.

R314.3.1 Installation near cooking appliances. Smoke alarms shall not be installed in the following locations unless this would prevent placement of a smoke alarm in a location required by Section R314.3.

1. Ionization smoke alarms shall not be installed less than 20 feet (6096 mm) horizontally from a permanently installed cooking *appliance*.
2. Ionization smoke alarms with an alarm-silencing switch shall not be installed less than 10 feet (3048 mm) horizontally from a permanently installed cooking *appliance*.
3. Photoelectric smoke alarms shall not be installed less than 6 feet (1828 mm) horizontally from a permanently installed cooking *appliance*.

* * *

SECTION R315

CARBON MONOXIDE ALARMS

* * *

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

[W]R315.2.1 New construction. For new construction, approved carbon monoxide alarms 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. ((~~provided in dwelling units where either or both of the following conditions exist.~~

~~1. The *dwelling unit* contains a fuel-fired *appliance*.~~

~~2. The *dwelling unit* has an attached garage with an opening that communicates with the dwelling unit.~~))

[W]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. **((**~~Where *alterations*, repairs or *additions* requiring a permit occur, or where one or more sleeping rooms are added or created in existing *dwellings*, the individual *dwelling unit* shall be equipped with carbon monoxide alarms located as required for new *dwellings*.~~))

Exceptions:

1. Work involving 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, electrical or mechanical systems are exempt from the requirements of this section.

3. Owner-occupied single-family residences legally occupied before July 26, 2009. See RCW 19.27.530 (2)(b).

[W]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 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.

* * *

SECTION R319

SITE ADDRESS

R319.1 Address identification. Buildings shall be provided with *approved* address identification. The address identification shall be legible and placed in a position that is visible from the street or road fronting the property. Address identification characters shall contrast with their background. Address numbers shall be Arabic numbers or alphabetical letters. Numbers shall not be spelled out. Each character shall be not less than 4 inches (102 mm) in height with a stroke width of not less than 0.5 inch (12.7 mm). Where required by the fire code official, address identification shall be provided in additional *approved* locations to facilitate emergency response. Where access is by means of a private road and the building address cannot be viewed from the public way, a monument, pole or other sign or means shall be used to identify the structure. Address identification shall be maintained.

Premises shall be identified in accordance with *International Building Code* Section 501.2

* * *

SECTION R322

FLOOD-RESISTANT CONSTRUCTION

R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas, including A or V Zones and Coastal A Zones, as established in Table R301.2(1) and areas of special flood hazard as defined in Seattle Municipal Code Section 25.06.030, and substantial improvement and restoration of substantial damage of buildings and structures in flood hazard areas, shall be designed and constructed in accordance with the provisions contained in this section and *Seattle Municipal Code* Chapter 25.06, the Seattle Floodplain Development Ordinance. Buildings and structures that are located in more than one flood hazard area shall comply with the provisions associated with the most restrictive flood hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.

* * *

R322.1.7 Protection of water supply and sanitary sewage systems. New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the *Uniform Plumbing Code* ((~~plumbing provisions of this code and Chapter 3 of the *International Private Sewage Disposal Code.*~~))

* * *

R322.2 Flood hazard areas (including A Zones). Areas that have been determined to be prone to flooding and that are not subject to high-velocity wave action shall be designated as flood hazard areas. Flood hazard areas that have been delineated as subject to wave heights between 11/2 feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Coastal A Zones and are subject to the requirements of Section R322.3. Buildings and structures constructed in whole or in part in flood hazard areas shall be designed and constructed in accordance with Sections R322.2.1 through R322.2.3.

R322.2.1 Elevation requirements.

1. Buildings and structures in flood hazard areas, including flood hazard areas designated as Coastal A Zones, shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher, or a greater elevation as designated by the *Seattle Municipal Code*.
2. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including *basement*) elevated to a height above the highest adjacent *grade* of not less than the depth number specified in feet (mm) on the FIRM plus 1 foot (305 mm), or not less than 3 feet (915 mm) if a depth number is not specified.
3. Basement floors that are below *grade* on all sides shall be elevated to or above base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.

Exception: Enclosed areas below the design flood elevation, including *basements* with floors that are not below *grade* on all sides, shall meet the requirements of Section R322.2.2.

* * *

SECTION 324

SOLAR ENERGY SYSTEMS

* * *

[W]R324.3 Photovoltaic systems. Installation, modification, or alteration of solar photovoltaic power systems shall comply with this section and the *International Fire Code*. Photovoltaic systems shall be designed and installed in accordance with Sections R324.3.1 through R324.6.1 and ((~~NFPA 70~~)) the Seattle Electrical Code. 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 life safety.

R324.3.1 Equipment listings. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703.

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. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than four pounds per square foot.

4. Photovoltaic modules are not mounted higher than 18 inches 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.

[W]R324.4.1 Roof ((~~live~~)) load. ((~~Roof structures that provide support for photovoltaic panel systems shall be designed for applicable roof live load. The design of roof structures need not include roof live load in the areas covered by photovoltaic panel systems.~~)) Portions of roof structures not covered by photovoltaic panel systems shall be designed for dead loads and roof ((~~live~~)) loads in accordance with Section R301.4 and R301.6. Portions of ((~~R~~)) roof structures ((~~that provide support for~~)) covered by photovoltaic panel systems shall be designed for the following load cases: ((~~live load, LR, for the load case where the photovoltaic panel system is not present.~~))

1. Dead load (including photovoltaic panel weight) plus snow load in accordance with Table R301.2 (1).

2. Dead load (excluding photovoltaic panel weight), plus roof live load or snow load, whichever is greater, in accordance with Section R301.6.

[W]R324.4.2 Wind resistance. Rooftop-mounted photovoltaic panel or module systems and their supports shall be designed to resist the component and cladding loads specified in Table R301.2 (2), adjusted for height and exposure in accordance with Table R301.2 (3).

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SECTION R325

MEZZANINES

* * *

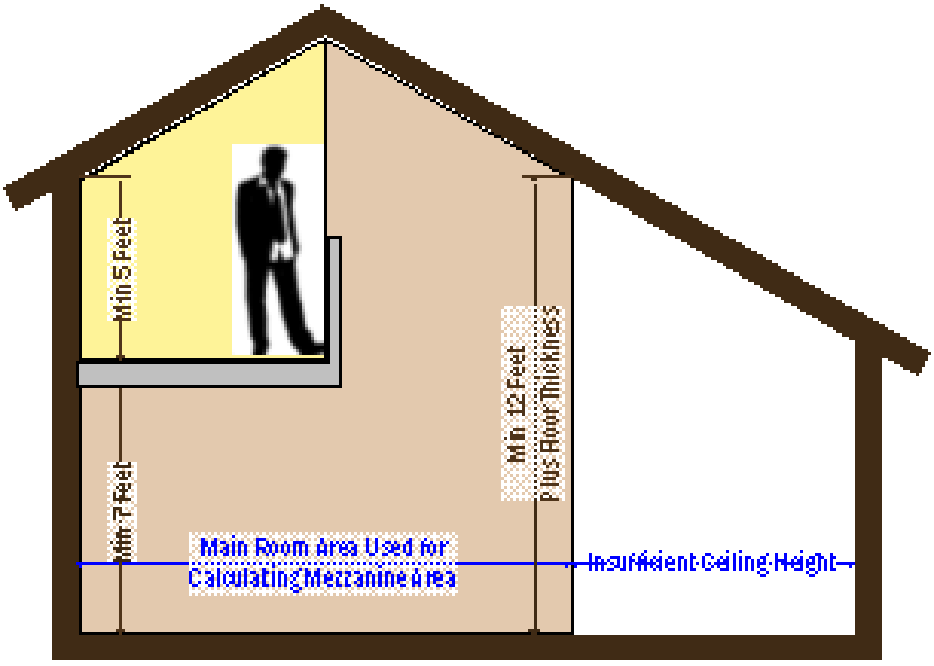
R325.3 Area limitation. The aggregate area of a *mezzanine* or *mezzanines* shall be not greater than one-third of the floor area of the room or space in which they are located. The enclosed portion of a room shall not be included in a determination of the floor area of the room in which the *mezzanine* is located.

Interpretation R325.3: Only the following unenclosed areas of the room or space containing the *mezzanine* shall be used for purposes of calculating the allowable *mezzanine* floor area:

. Areas with a ceiling height of at least 7 feet located directly below the *mezzanine*, except that no additional area benefit shall be gained for stacked *mezzanines*, and;

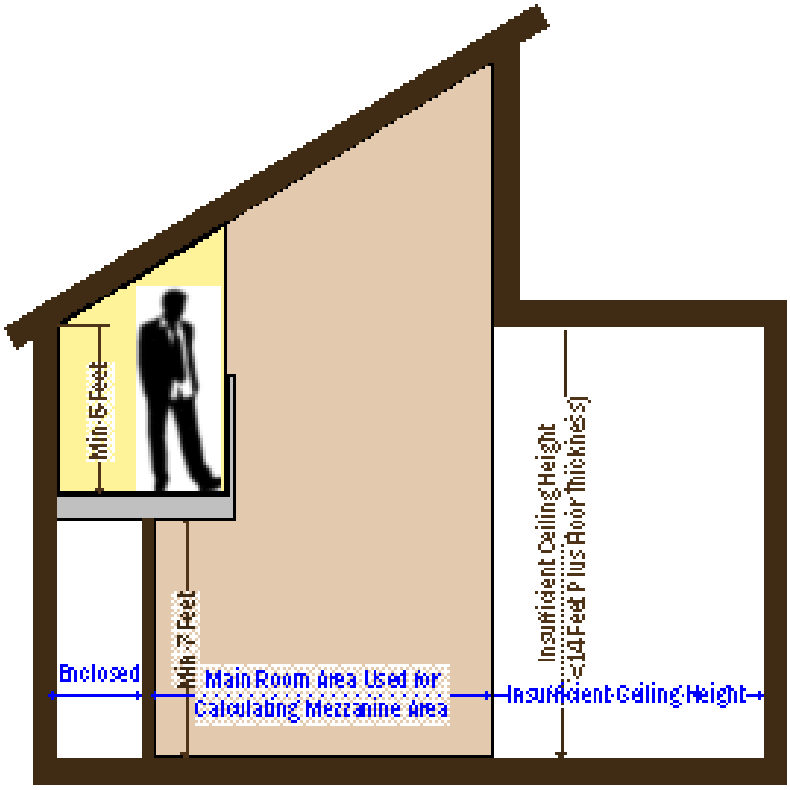
. Areas where the ceiling has a slope of less than 2:12 and with a ceiling height of at least 14 feet plus the thickness of the *mezzanine* floor construction, and;

. Areas where the ceiling has a slope of 2:12 or more and has a ceiling height of at least 12 feet plus the thickness of the *mezzanine* floor construction, provided that the *mezzanine* complies with Section 1208.2, exception 2.



Basis for Calculating Allowable Mezzanine Area
When Using Sloped Ceiling Provisions

1



Basis for Calculating Allowable Mezzanine Area With Other Conditions

R325.4 Means of egress. The means of egress for mezzanines shall comply with the applicable provisions of Section R311.

[W]R325.5 Openness. Mezzanines shall be open and unobstructed to the room in which they are located except for walls not more than 36 inches (1067 mm) in height, columns and posts.

Exceptions:

1. Mezzanines or portions thereof are not required to be open to the room in which they are located, provided that the aggregate floor area of the enclosed space is not greater than 10 percent of the mezzanine area.
2. Mezzanines ((~~In buildings~~)) that are not more than two *stories above grade plane* and equipped throughout with an automatic sprinkler system in accordance with Section

((~~R313~~)) P2904, ((~~a mezzanine~~)) shall not be required to be open to the room in which the mezzanine is located.

* * *

[W] SECTION R327

FAMILY HOME CHILD CARE

R327.1 Family home child care means of egress. 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.

R327.1.1 Basement egress. Basements located more than 4 feet (1219 mm) 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; or
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; or
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.

R327.1.2 Floors above grade. 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; or

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.

R327.2 Emergency escape and rescue. 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.

R327.3 Special hazards. 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 one-hour fire-resistance-rated construction.

Exception: A fire-resistance-rated separation is not 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.

[W] SECTION R328

ADULT FAMILY HOMES

R328.1 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.

R328.2 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 R328.9 is provided.
3. Type NS2 - Where two means of egress are at grade level or ramps constructed in accordance with R328.9 are provided.

R328.3 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.

R328.4 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. 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.

R328.5 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.

R328.6 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 *International Fire Code.*

R328.7 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.

R328.7.1 Grab bar cross section. Grab bars with a circular cross section shall have an outside diameter of 1-1/4 inches minimum and 2 inches maximum. Grab bars with noncircular cross section shall have a cross section dimension of 2 inches maximum and a perimeter dimension of 4 inches minimum and 4-5/8 inches maximum.

R328.7.2 Grab bar installation. Grab bars shall have a spacing of 1-1/2 inches 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 inches to the grab bar.

Exception: Swing-up grab bars shall not be required to meet the 1-1/2 inch 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 shall have a graspable surface finish.

R328.7.3 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 R328.7. Grab bars shall mount between 33 inches and 36 inches above floor grade. Centerline distance between grab bars, regardless of type used, shall be between 25 inches minimum and 30 inches maximum.

R328.7.3.1 Fixed position grab bars. Fixed position grab bars shall be at least 36 inches in length and start 12 inches from the rear wall.

R328.7.3.2 Swing-up grab bars. Swing-up grab bars shall be a minimum of 28 inches in length from the rear wall.

R328.7.4 Grab bars at bathtubs. Horizontal and vertical grab bars shall meet the requirements of Section R328.8.

R328.7.4.1 Vertical grab bars. Vertical grab bars shall be a minimum of 18 inches long and installed at the control end wall and head end wall. Grab bars shall be mounted within

4 inches of the exterior of the bath tub edge or within 4 inches within the bath tub. The bottom end of the bar shall start between 36 inches and 42 inches above floor grade.

Exception: The required vertical grab bar can be substituted with a floor to ceiling grab bar meeting the requirements of Section R328.7 at the control end and head end entry points.

R328.7.4.2 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 and 36 inches above floor grade. Control end and head end grab bars shall be at least 24 inches in length. Back wall grab bars shall be at least 36 inches in length.

R328.7.5 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 R328.7.

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.

R328.7.5.1 Vertical grab bars. Vertical grab bars shall be at least 18 inches in length and installed at the control end wall and head end wall. Vertical bars shall mount within 4 inches of the exterior of the shower stall or within 4 inches inside the shower stall. The bottom end of vertical bars shall be mounted between 36 inches and 42 inches above floor grade.

R328.7.5.2 Horizontal grab bars. Horizontal grab bars shall be installed on all sides of the shower stall mounted between 33 inches and 36 inches above the floor grade.

Horizontal grab bars shall be a maximum of 6 inches from adjacent walls. Horizontal grab bars shall not interfere with shower control valves.

R328.8 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 R328.8.1.

R328.8.1 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 R311.8.1 through R311.8.3.3.

R328.9 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 R328.9.1.

R328.9.1 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 through R311.7.8.4.

R328.10 Shower stalls. Where provided to meet the requirements for bathing facilities, the minimum size of shower stalls for adult family homes shall be 30 inches deep by 48 inches long.

SECTION R329

FLOATING HOMES

R329.1 Moorage location. Every *floating home moorage* shall be located on privately-owned or privately-controlled premises in accordance with the Land Use Code, Title 23 of the Seattle Municipal Code.

R329.2 Land access. Every *floating home moorage* shall have not less than 20 feet (6096 mm) of land frontage abutting a public street sufficiently improved for automobile travel.

R329.3 Moorage walkways. Every *floating home moorage* shall have firm and substantial walkways with a net width of not less than 4 feet (1219 mm) and extending from land to every *floating home site* in the moorage.

R329.4 Moorage lighting. Every *floating home moorage* and the walkways to every *floating home site* shall be illuminated to provide safe access. All luminaires shall be listed for the use.

R329.5 Fire protection. *Floating home moorages* shall be provided with fire extinguishing equipment as follows:

1. Portable fire-protection equipment. One fire extinguisher, 2A, 20-B:C rating minimum, shall be provided in each required hose station. The fire chief shall designate the type and number of all other fire appliances to be installed and maintained in each floating home moorage.
2. Standpipes. All portions of floats exceeding 250 feet (76 500 mm) in distance from fire apparatus access and marine service stations shall be provided with an approved Class I standpipe system installed according to International Building Code Section 905 and the *International Fire Code*.

R329.6 Water service connections. Every *floating home moorage* shall have a water service connection and shall provide water service piping securely fastened and stabilized above water from the water service connection to an outlet connection at each floating home site on a *floating home moorage*. The water piping in every *floating home* in a *floating home moorage* shall be connected to the water service outlet serving the *floating home* and the connection shall be securely fastened and stabilized above high water line. Water service connections and water service piping shall be constructed, installed and maintained in accordance with applicable standards established by or pursuant to ordinance.

R329.7 Public sewer connection. Every *floating home moorage* any part of which is within 300 feet (91 440 mm) of a public sewer and every *floating home moorage* on Shilshole Bay, Salmon Bay, Lake Washington Ship Canal, Lake Union, Portage Bay, Union Bay and that portion of Lake Washington lying within the city limits of Seattle shall have a lawfully-installed connection to a public sewer.

R329.8 Local side sewer system. Every *floating home moorage* within the limits specified in Section R329.7 shall provide a local side sewer system for the collection of *sewage* from every *floating home* in the moorage. The local side sewer system shall be connected to the public sewer, shall have an inlet connection at each *floating home site* and shall be constructed, installed and maintained in accordance with this and all other applicable ordinances regulating the construction, alteration, repair and connection of side sewers.

R329.9 Connection to local side sewer system. Every *floating home* in a *floating home moorage* that is required under Section R329.7 to be connected to a public sewer shall be connected to the local side sewer system. Owners and operators of *floating home moorages* shall not permit any *floating home* to be moored at any moorage under their control unless the *floating home* is connected to the local side sewer system. It is a violation for any person to use, occupy or let any *floating home* for human habitation within the limits specified in Section R329.7 unless it is connected to the sewer system.

A reconnection permit is required for any *floating home* that is relocated from its original site of connection to a local side sewer system. Such reconnection is subject to the approval of the Director of Seattle Public Utilities.

R329.10 Sewer installation fees. The fee for the installation of any side sewer serving a *floating home moorage* is the fee provided by law for the connection to the public sewer of side sewers serving mobile home parks.

R329.11 Plumbing systems. All plumbing and plumbing systems in every *floating home* shall meet the requirements of the *Uniform Plumbing Code* except as otherwise approved by the Director of Public Health.

R329.12 Garbage disposal. Every *floating home moorage* shall be provided with adequate *garbage* storage and collection facilities, which shall be located in an accessible place on the moorage site. No garbage or refuse shall be thrown or dumped into the waters.

R329.13 Electrical service and wiring. Electrical service approved by City Light shall be provided to *floating homes* and *floating home moorages*. Electrical wiring and equipment in every *floating home* shall conform to requirements of the *Seattle Electrical Code*. No *floating home* shall be permitted to connect or reconnect to the electric utility's distribution system unless approved for such connection by the building official in accordance with the *Seattle Electrical Code*.

R329.14 Housing standards for existing floating homes. Every *floating home* shall comply with the minimum housing standards of the *Seattle Housing and Building Maintenance Code* except as otherwise approved by the building official in accordance with the *Housing and Building Maintenance Code*.

R329.15 Property lines. The boundaries of *floating home moorage* sites shall be considered the lot line for determining compliance with Section R302.

Interpretation R329.15: For the purposes of determining the required wall and opening protection and roof-covering requirements, distance shall be measured to the exterior wall of the home, and not to the float.

R329.16 Approval of moorage site plan required. Every *floating home moorage* shall continuously conform to a moorage site plan that has been approved by the building official. Such approval shall be obtained as follows: Three copies of the site plan, drawn to scale and completely dimensioned, and setting forth the address and legal description of the property on which the moorage is located and the name and address of the owner or operator of the moorage, shall be filed with the building official.

The moorage site plan shall show:

1. The dimensions of the *floating home moorage* site;
2. The location of abutting public waterways;
3. The location and dimensions of private waterways and land access to the moorage;
4. The location and identification of individual floating home sites;
5. The location and dimensions of off-street parking spaces;
6. The location and dimensions of walkways and any accessory structures or facilities;
7. The water service system;
8. The local side sewer system; and
9. The electrical service and lighting system.

The site plan shall be reviewed by the code official, the Fire Chief, the Director of Public Health, the Director of Seattle Public Utilities and the Director of Transportation for conformance with the requirements of this code and other applicable ordinances. Upon approval by the building official, one copy of the approved site plan shall be retained in the office of the

building official, one copy in the office of the Director of Public Health and one copy, which shall be maintained on the premises of the *floating home moorage*, shall be returned to the owner or operator.

R329.17 Moorage register of ownership. Every owner or operator of a *floating home moorage* shall maintain a current register of every *floating home* moored on the premises, such register to record the name and address of the legal owner of each *floating home* and the registration number assigned to it by the King County Assessor. A copy of the register shall be made available upon request to any City department referred to in this chapter.

SECTION R330

SECURITY FROM CRIMINAL ACTIVITY

R330.1 Building entrance locks. Building entrance doors, including garage doors, shall be capable of locking. They shall be equipped with a dead-locking latch bolt with at least a 1/2 inch throw that penetrates the striker not less than 1/4 inch. Building entrance doors shall be openable from the inside without use of a key or special knowledge or effort.

Exception: Garage-to-exterior doors are permitted to be equipped with an electronically-operated remote control device for opening and closing in lieu of a dead-locking latch bolt. When garage-to-exterior doors are equipped with remote control devices, garage-to-building doors need not be capable of locking.

R330.2 Observation ports. Every building entrance door, other than garage doors, shall have a visitor observation port or glass side light. Observation ports shall be installed at a height of not less than 54 inches (1372 mm) and not more than 66 inches (1676 mm) from the floor.

R330.3 Windows and sliding doors. Dead bolts or other approved locking devices shall be provided on all sliding doors and openable windows. The lock shall be installed so that the mounting screws for the lock case are inaccessible from the outside.

Exception: Windows with sills located 10 feet (3048 mm) or more above grade, or 10 feet or more above a deck, balcony or porch that is not readily accessible from grade except through a housing unit need not have operable inside latching devices.

R330.4 Alternate security devices. Subject to the approval of the building official, alternate security devices are permitted to be substituted for those required by this section. Alternate devices must have equal capability to resist illegal entry. The installation of the device shall not conflict with other requirements of this code and other ordinances regulating the safety of exiting.

SECTION R331

SOUND TRANSMISSION CONTROL

R331.1 General. Wall and floor-ceiling assemblies separating dwelling units shall provide sound insulation in accordance with this Section R331.

R331.1.1 Perimeter joints. Joints in the perimeter of such separating wall or floor-ceiling assembly shall be acoustically sealed with a permanent resilient material approved for the purpose. The separating wall or floor-ceiling assembly shall extend completely to and be sealed to another separating assembly or an exterior wall, roof or floor assembly.

R331.1.2 Penetrations. Conduits, ducts, pipes and vents within the wall or floor-ceiling assembly causing vibration shall be reasonably isolated from the building construction at points of support by means of resilient sleeves, mounts or underlayments. All other openings

through which such conduits, ducts, pipes or vents pass shall have the excess opening fully sealed with insulative and permanently resilient materials approved for the purpose.

R331.1.3 Fire-resistance ratings. Design and materials for sound transmission control shall not impair the fire-resistance rating of separating walls or floor-ceiling assemblies required to be of fire-resistance-rated construction.

R331.2 Airborne sound. Airborne sound insulation for wall and floor-ceiling assemblies shall meet a Sound Transmission Class (STC) rating of 45 when tested in accordance with ASTM E 90.

R331.2.1 Outlet boxes. Electrical outlet boxes shall not be placed back-to-back and shall be offset by not less than 12 inches (305 mm) from outlets in the opposite wall surface. The back and sides of boxes shall be sealed with 1/8 inch resilient sealant and backed by a minimum of 2 inch thick mineral fiber insulation or approved equivalent.

R331.3 Structural-borne sound. Floor-ceiling assemblies between dwelling units or between a dwelling unit and a public or service area within a structure shall have an Impact Insulation Class (IIC) rating of not less than 50 when tested in accordance with ASTM E 492. Floor covering may be included in the assembly to obtain the required ratings.

Exception: Floor assemblies in bathrooms are not required to meet the IIC rating of 50 where structural concrete floor systems are used.

R331.4 Tested assemblies. Field- or laboratory-tested wall or floor-ceiling designs having an STC or IIC of 50 or more may be used without additional field testing when, in the opinion of the building official, the tested design has not been compromised by flanking paths. Tests may be required by the building official when evidence of compromised separations is noted. Wall or

floor-ceiling designs field tested by ASTM E 336 having a minimum FSTC or FIIC rating of 45 may be used.

R331.5 Field testing and certification. Field testing, when permitted to determine airborne sound transmission or impact sound insulation class, shall be done in accordance with ASTM E 492 under the supervision of an acoustical professional who is experienced in the field of acoustical testing and engineering and who shall forward certified test results to the building official that minimum sound insulation requirements stated above have been met.

R331.6 Sound transmission control systems. Generic systems listed in GA 600 may be accepted where a laboratory test indicates that the requirements of Section R329 are met by the system.

Section 5. The following sections of Chapter 4 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 4

FOUNDATIONS

* * *

R401.5 Protection of adjoining property. Adjoining public and private property shall be protected from damage during construction, remodeling and demolition work. Protection shall be provided for footings, foundations, party walls, chimneys, skylights and roofs. Provisions shall be made to control water runoff and erosion during construction or demolition activities. When the existing grade of a site is altered by filling, excavating, dredging or moving of earth materials, the owner shall protect all adjoining property during construction from encroachment or collapse by sloping the sides of the temporary grading at a slope that is safe and not more than one horizontal to one vertical. In addition, adjoining property shall be protected from

encroachment or collapse by sloping the sides of the permanent grading at a slope not greater than two horizontal to one vertical. The building official is authorized to approve temporary or permanent slopes that are steeper based on a design by an experienced geotechnical engineer.

In areas of known unsuitable soils, the building official is authorized to require slopes that are less steep to assure protection of adjoining property.

SECTION R402

MATERIALS

* * *

R402.2 Concrete. Concrete shall have a minimum specified compressive strength of f'_c, as shown in Table R402.2. Concrete subject to moderate or severe weathering as indicated in Table R301.2(1) shall be air entrained as specified in Table R402.2. The maximum weight of fly ash, other pozzolans, silica fume, slag or blended cements that is included in concrete mixtures for garage floor slabs and for exterior porches, carport slabs and steps that will be exposed to deicing chemicals shall not exceed the percentages of the total weight of cementitious materials specified in Section 19.3.3.4 of ACI 318. Materials used to produce concrete and testing thereof shall comply with the applicable standards listed in Chapters 19 and 20 of ACI 318 or ACI 332.

Code Alternate R402.2: Five-sack 2000 psi (13 790 kPa) and 5-1/2-sack 2500 psi (17 237 kPa) concrete mixes in accordance with *International Building Code* Section 1904.2 are equivalent to 3000 psi (20 684 kPa) concrete for weathering potential. In addition, air-entrainment is not required to address weathering.

R402.2.1 Materials for concrete. Materials for concrete shall comply with the requirements of Section R608.5.1.

* * *

SECTION R408

UNDER-FLOOR SPACE

[W]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. ((~~The minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2) for each 150 square feet (14 m^2) of under-floor space area, unless the ground surface is covered by a Class 1 vapor retarder material. Where a Class 1 vapor retarder material is used, the minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2) for each 1,500 square feet (140 m^2) of under-floor space area. One such ventilating opening shall be within 3 feet (914 mm) of each corner of the building.~~)) 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 six inches minimum at the joints and shall extend to the foundation wall.

Exception: The ground cover may be omitted in crawl spaces if the crawl space has a concrete slab floor with a minimum thickness of two inches.

[W]R408.2 Openings for under-floor ventilation. The minimum net area of ventilation openings shall be not less than 1 square foot (0.0929 m^2) for each ((~~150~~)) 300 square feet (((~~14~~)) 28 m^2) of under-floor area. ((~~One ventilation opening shall be within 3 feet (915 mm) of each corner of the building.~~)) 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 ¼ inch (6.4 mm):

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) thick.

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 to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with the requirements of Appendix F. to originate from a point between the ground cover and soil. The radon vent shall be installed in accordance with the requirements of Appendix F (Radon) of this code.

[W]R408.3 Unvented crawl space. Ventilation openings in under-floor spaces specified in Sections R408.1 and R408.2 shall not be required where the following items are provided:

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 not less than 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 F; ((~~or insulation~~)).

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^2) of crawlspace floor area. Exhaust ventilation shall terminate to the exterior.

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

((~~2. One of the following is provided for the under-floor space:~~

~~2.1 Continuously operated mechanical exhaust ventilation at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m^2) of crawl space floor area, including an air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code.~~

~~2.2 Conditioned air supply sized to deliver at a rate equal to 1 cubic foot per minute (0.47 L/s) for each 50 square feet (4.7 m^2) of under-floor area, including a return air pathway to the common area (such as a duct or transfer grille), and perimeter walls insulated in accordance with Section N1102.2.11 of this code.~~

~~2.3 Plenum in existing structures complying with Section M1601.5, if under-floor space is used as a plenum~~.))

* * *

Section 6. The following sections of Chapter 5 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 5

FLOORS

* * *

SECTION R507

EXTERIOR DECKS

* * *

[W] TABLE R507.2.1
PLACEMENT OF LAG SCREWS AND BOLTS IN DECK LEDGERS AND BAND JOISTS

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

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 R507.2.1(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 ((~~or bolts~~)) to the top edge of the ledger shall be in accordance with Figure R507.2.1(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.

* * *

[W]R507.2.4 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3 (1) or R507.2.3 (2). Where the lateral load connection is provided in accordance with Figure R507.2.3(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 1,500 pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.2.3(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.

* * *

Section 7. The following sections of Chapter 6 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 6

WALL CONSTRUCTION

* * *

SECTION R602

WOOD WALL FRAMING

* * *

[W]((~~**R602.7.5 Supports for headers.** Headers shall be supported on each end with one or more jack studs or with approved framing anchors in accordance with Table R602.7(1) or R602.7(2). The full-height stud adjacent to each end of the header shall be end nailed to each~~

~~end of the header with four-16d nails (3.5 inches × 0.135 inches). The minimum number of full-height studs at each end of a header shall be in accordance with Table R602.7.5.~~))

~~TABLE R602.7.5~~
~~MINIMUM NUMBER OF FULL-HEIGHT STUDS~~
AT EACH END OF HEADERS IN EXTERIOR WALLS

HEADER SPAN (feet)	~~MAXIMUM STUD SPACING (inches)~~ [per Table R602.3(5)]	
	16	24
≤ 3'	1	1
4'	2	1
8'	3	2
12'	5	3
16'	6	4

* * *

[**W**]**R602.9 Foundation ((~~C~~))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 R602.10.9.1with 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 ((~~C~~))*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 Section 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.

* * *

[W]R602.10.11 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 that the length of the cripple wall bracing shall be multiplied by a factor of 1.15. Where gypsum wallboard 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.

* * *

SECTION R609

EXTERIOR WINDOWS AND DOORS

* * *

[W]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*.

* * *

Section 8. The following sections of Chapter 7 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 7

WALL COVERING

* * *

SECTION R702

INTERIOR COVERING

* * *

[W]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 ¼-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 ¼-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."

* * *

SECTION R703

EXTERIOR COVERING

* * *

[W]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 ((~~to the exterior~~)) 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 in accordance with 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 by 8 feet (1219 mm by 2438 mm) in size.

2.3 Exterior wall assemblies shall be tested at a minimum differential pressure of 6.24 pounds per square foot (299 Pa).

2.4 Exterior wall envelope assemblies shall be subjected to the minimum test exposure ((~~for a minimum~~)) duration of 2 hours.

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.

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.

Interpretation R703.1.1: According to Section R703.1 exception 3, a rain-screen or similar construction method is not required for most exterior siding and cladding, and single-wall construction is allowed. Drainage methods are required to conform to the manufacturer's installation instructions and other sections of the *International Residential Code*.

Note: The "water-resistive barrier" behind the exterior wall covering provides drainage of the water that may enter an exterior wall envelope. If water penetrates the exterior wall covering, the felt paper or other approved material will direct the water to the bottom of the wall where it will escape to the exterior.

* * *

[W]R703.4 Flashing. Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with

AAMA 714. The flashing shall extend to the surface of the exterior wall finish. *Approved* corrosion-resistant flashings shall be installed at the following locations:

1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. ((~~Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:~~

~~1.1. The fenestration manufacturer's installation and flashing instructions, or for application not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.~~

~~1.2. In accordance with the flashing design or method of a registered design professional.~~

~~1.3. In accordance with other approved methods.~~))

2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.

3. Under and at the ends of masonry, wood or metal copings and sills.

4. Continuously above all projecting wood trim.

5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.

6. At wall and roof intersections.

7. At built-in gutters.

* * *

[W]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 ¼ inches (32 mm) and lap siding shall be installed in accordance with the manufacturer's installation instructions ((~~not having tongue-and-groove end joints shall have the ends protected with caulking, covered with an H-section joint cover, located over a strip of flashing,~~)) 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.

* * *

Section 9. The following sections of Chapter 8 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 8

ROOF-CEILING CONSTRUCTION

* * *

SECTION R806

ROOF VENTILATION

* * *

R806.5 Unvented attic and unvented enclosed rafter assemblies. Unvented *attics* and unvented enclosed roof framing assemblies created by ceilings that are applied directly to the underside of the roof framing members and structural roof sheathing applied directly to the top of the roof framing members/rafters, shall be permitted where all the following conditions are met:

1. The unvented *attic* space is completely within the building thermal envelope.
2. No interior Class I vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly or on the ceiling side of the unvented enclosed roof framing assembly.
3. Where wood shingles or shakes are used, a minimum 1/4-inch (6.4 mm) vented airspace separates the shingles or shakes and the roofing underlayment above the structural sheathing.
4. ((~~In Climate Zones 5, 6, 7 and 8, any~~)) Any *air-impermeable insulation* shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation.
5. Insulation shall be located in accordance with the following:
    5.1. Item 5.1.1, 5.1.2, 5.1.3 or 5.1.4 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.
        5.1.1. Where only *air-impermeable insulation* is provided, it shall be applied in direct contact with the underside of the structural roof sheathing.
        5.1.2. Where air-permeable insulation is provided inside the building thermal envelope, it shall be installed in accordance with Section 5.1. In addition to the air-permeable insulation installed directly below the structural sheathing, minimum R-10

rigid board or sheet insulation shall be installed directly above the structural roof sheathing ((~~in accordance with the R-values in Table R806.5~~)) for condensation control.

5.1.3. Where both air-impermeable and air-permeable insulation are provided, ((~~the~~)) minimum R-10 *air-impermeable insulation* shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1. ((~~and shall be in accordance with the R-values in Table R806.5~~)) for condensation control. The air-permeable insulation shall be installed directly under the *air-impermeable insulation*.

5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45°F (7°C). For calculation purposes, an interior air temperature of 68°F (20°C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months.

5.2. Where preformed insulation board is used as the *air-impermeable insulation* layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.

* * *

Section 10. The following sections of Chapter 9 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 9

ROOF ASSEMBLIES

* * *

SECTION R903

WEATHER PROTECTION

* * *

R903.4 Roof drainage. Unless roofs are sloped to drain over roof edges, roof drains shall be installed at each low point of the roof.

[W]R903.4.1 Secondary (emergency overflow) drains or scuppers. Where roof drains are required, secondary emergency overflow ((~~roof~~)) 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 ((~~1106 and 1108~~)) 1101 and 1103 of the ((~~*International*~~)) *Uniform Plumbing Code*, as applicable.

Overflow drains shall discharge to an *approved* location ((~~and shall not be connected to roof drain lines~~)).

* * *

Section 11. The following sections of Chapter 10 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 10

CHIMNEYS AND FIREPLACES

SECTION R1001

MASONRY FIREPLACES

* * *

R1001.7 Lintel and throat. Masonry over a fireplace opening shall be supported by a lintel of noncombustible material. The minimum required bearing length on each end of the fireplace opening shall be 4 inches (102 mm). The fireplace throat or damper shall be located not less than 8 inches (203 mm) above the lintel.

[W]R1001.7.1 Damper. Masonry fireplaces shall be equipped with a ferrous metal damper located not less than 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, and shall be provided with an operable outside air duct damper.

3. Site built fireplaces shall have tight-fitting glass or metal doors, or a flue draft induction fan or as approved for minimizing backdrafting. Factory built fireplaces shall use doors listed for the installed appliance.

* * *

SECTION R1002

MASONRY HEATERS

* * *

[W]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.
2. Masonry heaters shall be *listed* and *labeled* in accordance with UL 1482 or CEN 15250 and installed in accordance with the manufacturer's instructions.

[W]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. Tight fitting 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 5% of the flue cross sectional area.

* * *

SECTION R1004

FACTORY-BUILT FIREPLACES

[W]R1004.1 General. Factory-built fireplaces shall be *listed* and *labeled* and shall be installed in accordance with the conditions of the *listing*. Factory-built fireplaces shall be tested in accordance with UL 127.

[W]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 low mass 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.

[W]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.

* * *

SECTION R1006

EXTERIOR AIR SUPPLY

R1006.1 Exterior air. Factory-built or masonry fireplaces covered in this chapter shall be equipped with an exterior air supply to ensure proper fuel combustion unless the room is mechanically ventilated and controlled so that the indoor pressure is neutral or positive.

[W]((R1006.1.1 Factory-built fireplaces. ~~Exterior *combustion air* ducts for factory-built fireplaces shall be a *listed* component of the fireplace and shall be installed in accordance with the fireplace manufacturer's instructions.~~

[W]R1006.1.2 Masonry fireplaces. ~~*Listed combustion air* ducts for masonry fireplaces shall be installed in accordance with the terms of their *listing* and the manufacturer's instructions.~~

[W]R1006.2 Exterior air intake. ~~The exterior air intake shall be capable of supplying all *combustion air* from the exterior of the *dwelling* or from spaces within the *dwelling* ventilated with outdoor air such as nonmechanically ventilated crawl or *attic* spaces. The exterior air intake shall not be located within the garage or basement of the dwelling. The exterior air intake, for other than listed factory-built fireplaces, shall not be located at an elevation higher than the firebox. The exterior air intake shall be covered with a corrosion-resistant screen of ¼-inch (6.4 mm) mesh.~~))

[W] R1006.2 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 as per manufacturer's specification. The air inlet shall originate at a point below the fire

box. The duct shall be 4 inches or greater in diameter, not exceed 20 feet in length, and be installed as per 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 in diameter or the equivalent in area or as approved.

R1006.3 Clearance. Unlisted *combustion air* ducts shall be installed with a minimum 1-inch (25 mm) clearance to combustibles for all parts of the duct within 5 feet (1524 mm) of the duct outlet.

[W]((R1006.4 Passageway. ~~The *combustion air* passageway shall be not less than 6 square inches (3870 mm^2) and not more than 55 square inches (0.035 m^2), except that *combustion air* systems for listed fireplaces shall be constructed in accordance with the fireplace manufacturer's instructions.~~))

* * *

Section 13. The following sections of Chapter 12 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 12

MECHANICAL ADMINISTRATION

SECTION M1201

GENERAL

[W]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 used to control 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 NFPA 58 (*Liquefied Petroleum Gas Code*) and ANSI Z223.1/NFPA 54 (*National Fuel Gas Code*).

M1201.2 Application. In addition to the general administration requirements of Chapter 1, the administrative provisions of this chapter shall also apply to the mechanical requirements of Chapters 13 through 24.

[W] 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.

[W] M1201.4 Testing. At the discretion of the building official, flow testing may be required to verify that the mechanical system 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.

* * *

Section 14. The following sections of Chapter 13 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 13

GENERAL MECHANICAL SYSTEM REQUIREMENTS

* * *

SECTION M1307

APPLIANCE INSTALLATION

* * *

[W] M1307.2 Anchorage of appliances. *Appliances* designed to be fixed in position shall be fastened or anchored in an *approved* manner. ((~~In Seismic Design Categories D0, D1 and D2, and in townhouses in Seismic Design Category C, water heaters and t~~))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 ((~~heater~~)) storage tank, acting in any horizontal direction. ((~~Strapping shall be at points within the upper one-third and lower one-third of the *appliance's* vertical dimensions. At the lower point, the strapping shall maintain a minimum distance of 4 inches (102 mm) above the controls.~~))
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 Uniform Plumbing Code.

* * *

Section 15. The following sections of Chapter 14 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 14

HEATING AND COOLING EQUIPMENT AND APPLIANCES

* * *

SECTION M1413

EVAPORATIVE COOLING EQUIPMENT

[W] 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 Section M1305.1.4.1.

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 ((~~P2902~~)) 603 of the *Uniform Plumbing Code*.

5. So that air intake opening locations are in accordance with Section R303.5.1.

* * *

Section 16. The following sections of Chapter 15 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 15

EXHAUST SYSTEMS

* * *

SECTION M1503

RANGE HOODS

M1503.1 General. Range hoods shall discharge to the outdoors through a duct. The duct serving the hood shall have a smooth interior surface, shall be air tight, shall be equipped with a back-draft damper and shall be independent of all other exhaust systems. Ducts serving range hoods 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 mechanical ((~~or natural~~)) *ventilation* is otherwise provided, *listed* and *labeled* ductless range hoods shall not be required to discharge to the outdoors.

* * *

SECTION M1505

OVERHEAD EXHAUST HOODS

[W]M1505.1 General. Domestic open-top broiler units shall have a metal exhaust hood, having a minimum thickness of 0.0157-inch (0.3950 mm) (No. 28 gage) with ¼ inch (6.4 mm) clearance 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 cabinet. The hood shall be not less than the width of the broiler unit, extend over the entire unit, and when located inside the building envelope, shall discharge to the outdoors and be equipped with a backdraft damper or other means to control infiltration/exfiltration when not in operation. Broiler units incorporating an integral exhaust system, and *listed* and *labeled* for use without an exhaust hood, or broiler units permanently installed outside the building envelope and having the cooking surface at least 5'0" below a 1-hour fire resistance rated ceiling, need not have an exhaust hood.

* * *

SECTION M1507

MECHANICAL VENTILATION

[W]M1507.1 General. ((~~Where~~ ~~l~~))Local exhaust ((~~or~~)) and whole-house mechanical ventilation systems and ((~~is provided, the~~)) equipment shall be designed in accordance with this section.

[W] M1507.2 Recirculation of air. Exhaust air from bathrooms and toilet rooms shall not be recirculated within a residence or to another *dwelling unit* and shall be exhausted directly to the outdoors. Exhaust air from bathrooms and toilet rooms shall not discharge into an *attic*, crawl space or other areas ((~~inside~~)) of the building.

M1507.3 Whole-house mechanical ventilation system. Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through ((~~M1507.3.3~~)) M1507.3.7.3.

[W]M1507.3.1 System design. ((~~The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.~~)) Each *dwelling unit* or *guestroom* shall be equipped with a ventilation system complying with Section M1507.3.4, M1507.3.5, M1507.3.6, or M1507.3.7. Compliance is also permitted to be demonstrated through compliance with the *International Mechanical Code* or ASHRAE Standard 62.2.

[W]M1507.3.2 ((~~System controls.~~)) Control and operation. ((~~The whole-house mechanical ventilation system shall be provided with controls that enable manual override.~~))

1. Location of controls. Controls for all ventilation systems shall be *readily accessible* by the occupant.

2. Instructions. Operating instructions for whole-house ventilation systems shall be provided to the occupant by the installer of the system.

3. Local exhaust systems. Local exhaust systems shall be controlled by manual switches, dehumidistats, timers, or other *approved* means.

4. Continuous whole-house ventilation systems. Continuous whole-house ventilation systems shall operate continuously and be equipped with an override control. A "fan on" switch shall be permitted as an override control. Controls shall be capable of operating the ventilation system without energizing other energy-consuming appliances. A clearly

visible label shall be affixed to the controls that reads "Whole House Ventilation (see operating instructions)."

5. Intermittent whole-house ventilation systems. Intermittent whole-house ventilation systems shall comply with the following:

5.1.They shall be capable of operating intermittently and continuously.

5.2. They shall have controls capable of operating the exhaust fans, forced-air system fans, or supply fans without energizing other energy-consuming appliances.

5.3. The ventilation rate shall be adjusted according to the exception in Section M1507.3.3.

5.4. The system shall be designed so that it can operate automatically based on the type of control timer installed.

5.5. The intermittent mechanical ventilation system shall operate at least one hour out of every four.

5.6. The system shall have a manual control and automatic control, such as a 24-hour clock timer.

5.7. At the time of final inspection, the automatic control shall be set to operate the whole-house fan according to the schedule used to calculate the whole-house fan sizing.

5.8. A label shall be affixed to the control that reads "Whole House Ventilation (see operating instructions)."

[W]M1507.3.2.1 Operating instructions. Installers shall provide the manufacturer's installation, operating instructions, and a whole-house ventilation system operation description.

[W]M1507.3.3 Mechanical ventilation rate. The whole-house mechanical ventilation system shall provide outdoor air to each dwelling unit at a continuous rate of not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4-hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

TABLE M1507.3.3(1)
Continuous Whole-House Mechanical Ventilation System Airflow Rate Requirements

	NUMBER OF BEDROOMS				
Dwelling Unit Floor Area (square feet)	**0 – 1**	**2 – 3**	**4 – 5**	**6 – 7**	**> 7**
	Airflow in CFM				
≤ 1,500	30	45	60	75	90
1,501 – 3,000	45	60	75	90	105
3,001 – 4,500	60	75	90	105	120
4,501 – 6,000	75	90	105	120	135
6,001 – 7,500	90	105	120	135	150
> 7,500	105	120	135	150	165

For SI: 1 square foot .= 0.0929 m^2, 1 cubic foot per minute .= 0.0004719 m^3/s.

TABLE M1507.3.3(2)
INTERMITTENT WHOLE-HOUSE MECHANICAL VENTILATION RATE FACTORS[a, b]

RUN-TIME PERCENTAGE IN EACH 4-HOUR SEGMENT	**25%**	**33%**	**50%**	**66%**	**75%**	**100%**
Factor[a]	4	3	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.

[W]M1507.3.4 Whole-house ventilation using exhaust fans. This section establishes minimum prescriptive requirements for whole-house ventilation systems using exhaust fans. A

system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole-house ventilation system.

[W]M1507.3.4.1 Whole-house ventilation fans. Exhaust fans providing whole-house ventilation shall have a flow rating at 0.25 inches water gauge as specified in Table M1507.3.3 (1). Manufacturers' fan flow ratings shall be determined according to HVI 916 or AMCA 210.

[W]M1507.3.4.2 Fan noise. Whole-house fans located 4 feet or less from the interior grille shall have a sone rating of 1.0 or less measured at 0.1 inches water gauge. Manufacturer's noise ratings shall be determined as per HVI 915 (March 2009). Remotely mounted fans shall be acoustically isolated from the structural elements of the building and from attached duct work using insulated flexible duct or other approved material.

[W]M1507.3.4.3 Fan controls. The whole-house ventilation fan shall meet the requirements of Sections M1507.3.2 and M1507.3.2.1

[W]M1507.3.4.4 Ventilation openings. Each habitable space shall be provided with outdoor air inlets or operable windows with an openable area not less than 4 square inches of net free area of opening for each 10 cfm of outdoor air required by Table M1507.7.3.3 (1). Where outdoor air supplies are separated from exhaust points by doors, provisions shall be made to ensure air flow by installation of distribution ducts, undercutting doors, installation of grilles, transoms, or similar means. Doors shall be undercut to a minimum of ½ inch above the surface of the finish floor covering.

Individual room outdoor air inlets shall:

1. Have controllable and secure openings;

2. Be sleeved or otherwise designed so as not to compromise the thermal properties of the wall or window in which they are placed;

3. Any inlet or combination of inlets which provide 10 cfm at 10 Pascals are deemed equivalent to 4 square inches net free area.

Ventilation openings shall be screened or otherwise protected from entry by leaves or other material. Openings shall be controllable, securable and shall be designed to not compromise the thermal properties of the building envelope. Ventilation openings shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attics, crawl spaces, or garages.

7. Asphalt roofs unless it is shown that no other location is permissible. In such cases the inlet opening shall be located a minimum of 2 feet from the nearest surface of the asphalt roofing, measured from the intake opening.

[W]M1507.3.5 Whole-house ventilation integrated with a forced-air system. This section establishes minimum prescriptive requirements for whole-house ventilation systems integrated with forced-air ventilation systems. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole-house ventilation system.

[W]M1507.3.5.1 Integrated whole-house ventilation systems. Integrated whole-house ventilation systems shall provide outdoor air at the rate calculated using Section M1507.3.3. Integrated forced-air ventilation systems shall distribute outdoor air to each habitable space through the forced-air system ducts. Integrated forced-air ventilation systems shall have an outdoor air inlet duct connecting a terminal element on the outside of the building to the return air plenum of the forced-air system, at a point within 4 feet upstream of the air handler. The outdoor air inlet duct connection to the return air stream shall be located upstream of the forced-air system blower and shall not be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The system shall be equipped with a motorized damper connected to the automatic ventilation control as specified in Section M1507.3.2. The required flow rate shall be verified by field testing with a flow hood or a flow measuring station.

[W]M1507.3.5.2 Ventilation duct insulation. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

[W] M1507.3.5.3 Outdoor air inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attics, crawl spaces, or garages.

[W]M1507.3.6 Whole-house ventilation using a supply fan. This section establishes minimum prescriptive requirements for whole-house ventilation systems using an inline supply fan. A system which meets all the requirements of this section shall be deemed to satisfy the requirements for a whole-house ventilation system.

[W][M1507.3.6.1 Outdoor air. Supply fan ventilation systems shall distribute outdoor air to each habitable space through the forced-air system ducts or through dedicated ducts to each habitable space. Supply fans shall have the capacity to provide the amount of outdoor air specified in Table M1507.3.3 (1) at 0.40 inches water gauge as per HVI 916. The outdoor air shall be filtered before it is delivered to habitable spaces. The filter may be located at the intake device, in line with the fan, or, in the case of a connection to the return plenum of the air handler, using the furnace filter. An outdoor air inlet shall be connected to either the supply or return air stream.

[W]M1507.3.6.2 Ducts. An outdoor air inlet duct connection to the supply air stream shall be located downstream of the forced-air system blower. An outdoor air inlet duct connection to the return air stream shall be located at least 4 feet upstream of the forced-air system blower and its filter. Neither type of duct shall be connected directly into a furnace cabinet to prevent thermal shock to the heat exchanger. The outdoor air inlet duct shall be prescriptively sized in accordance with Table M1507.3.6.2. The terminal element on the outside of the building shall be sized 2 inches in diameter larger than the outdoor air inlet duct.

TABLE M1507.3.6.2 Prescriptive Supply Fan Duct Sizing		
Supply Fan Tested cfm at 0.40" wg		
Specified Volume from Table M1507.3.3(1)	Minimum Smooth Duct Diameter	Minimum Flexible Duct Diameter
50 – 90 cfm	4 inch	5 inch
90 – 150 cfm	5 inch	6 inch
150 – 250 cfm	6 inch	7 inch
250 – 400 cfm	7 inch	8 inch

[W]M1507.3.6.3 Dampers. The system shall be equipped with a backdraft damper and one of the following:

1. A calibrated manual volume damper installed and set to meet the measured flow rates specified in Table M1507.3.3(1) by field testing with a pressure gauge and/or following manufacturer's installation instructions; or

2. A manual volume damper installed and set to meet the measured flow rates specified in Table M1507.3.3(1) by field testing with a flow hood or a flow measuring station; or

3. An automatic flow-regulating device sized to the specified flow rates in Table M1507.3.3(1) which provides constant flow over a pressure range of 0.20 to 0.60 inches water gauge.

[W]M1507.3.6.4 Ventilation duct insulation. All supply ducts in the conditioned space shall be insulated to a minimum of R-4.

[W]M1507.3.6.5 Outdoor air inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attics, crawl spaces, or garages.

[W]M1507.3.7 Whole-house ventilation using a heat recovery ventilation system. This section establishes minimum prescriptive requirements for whole-house ventilation using a heat recovery ventilation system.

[W]M1507.3.7.1 Heat recovery ventilation systems. All duct work in heat recovery systems shall be sized and installed per the manufacturer's instructions. System minimum flow rating shall be not less than that specified in Table M1507.3.3 (1). Heat recovery ventilation systems shall have a filter on the upstream side of the heat exchanger in both the intake and exhaust airstreams with a minimum efficiency rating value (MERV) of 6.

[W]M1507.3.7.2 Ventilation duct insulation. All supply ducts in the conditioned space installed upstream of the heat exchanger shall be insulated to a minimum of R-4.

[W]M1507.3.7.3 Outdoor air inlets. Inlets shall be screened or otherwise protected from entry by leaves or other material. Outdoor air inlets shall be located so as not to take air from the following areas:

1. Closer than 10 feet from an appliance vent outlet, unless such vent outlet is 3 feet above the outdoor air inlet.

2. Where it will pick up objectionable odors, fumes or flammable vapors.

3. A hazardous or unsanitary location.

4. A room or space having any fuel-burning appliances therein.

5. Closer than 10 feet from a vent opening of a plumbing drainage system unless the vent opening is at least 3 feet above the air inlet.

6. Attics, crawl spaces, or garages.

[W]M1507.4 Local exhaust ((~~rates~~)). Local exhaust shall be provided in each kitchen, bathroom, water closet, laundry room, indoor swimming pool, spa, and other rooms where water vapor or cooking odor is produced. *Local exhaust* systems shall be designed to have the capacity to exhaust the minimum air flow rate determined in accordance with Table M1507.4.

[W]M1507.4.1 Local exhaust fans. Exhaust fans providing local exhaust shall have a minimum fan flow rating not less than 50 cfm at 0.25 inches water gauge for bathrooms, laundries, or similar rooms and 100 cfm at 0.25 inches water gauge for kitchens. Manufacturers' fan flow ratings shall be determined as per HVI 916 (April 1995) or AMCA 210.

Exception: Where a range hood or down draft exhaust fan is used to satisfy the local exhaust requirements for kitchens, the range hood or down draft exhaust shall not be less than 100 cfm at 0.10 inches water gauge.

[W]M1507.4.2 Local exhaust controls. Local exhaust systems shall be controlled by manual switches, dehumidistats, timers, or other approved means. Local exhaust system controls shall be readily accessible.

[W]TABLE M1507.4 MINIMUM REQUIRED LOCAL EXHAUST RATES FOR ONE- AND TWO-FAMILY DWELLINGS	
AREA TO BE EXHAUSTED	**EXHAUST RATES**
Kitchens	100 cfm intermittent or 25 cfm continuous
Bathrooms-Toilet Rooms, laundry rooms, indoor swimming pools, spas	Mechanical exhaust capacity of 50 cfm intermittent or 20 cfm continuous
For SI: 1 cubic foot per minute = 0.0004719 m^3/s.	

Section 17. The following sections of Chapter 16 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 16

DUCT SYSTEMS

SECTION M1601

DUCT CONSTRUCTION

M1601.1 Duct design. *Duct systems* serving heating, cooling and *ventilation equipment* shall be installed in accordance with the provisions of this section and ACCA Manual D, the appliance manufacturer's installation instructions or other *approved* methods.

[W]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 glass 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. The 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 of 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 conditions:

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 fireblocking in accordance with Section R602.8.

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

* * *

Section 18. The following sections of Chapter 17 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 17

COMBUSTION AIR

SECTION M1701

GENERAL

[W]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.

* * *

Section 19. The following sections of Chapter 20 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 20

BOILERS AND WATER HEATERS

SECTION M2001

BOILERS

M2001.1 Boilers. Boilers shall comply with the Seattle Boiler and Pressure Vessel Code.

((~~M2001.1 Installation.~~ ~~In addition to the requirements of this code, the installation of boilers shall conform to the manufacturer's instructions. The manufacturer's rating data, the name-plate~~

and operating instructions of a permanent type shall be attached to the boiler. Boilers shall have their controls set, adjusted and tested by the installer. A complete control diagram together with complete boiler operating instructions shall be furnished by the installer. Solid and liquid fuel-burning boilers shall be provided with *combustion air* as required by Chapter 17.

M2001.1.1 Standards. Packaged oil-fired boilers shall be listed and labeled in accordance with UL 726. Packaged electric boilers shall be listed and labeled in accordance with UL 834. Solid fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed, constructed and certified in accordance with the ASME *Boiler and Pressure Vessel Code*, Section I or IV. Controls and safety devices for boilers with fuel input ratings of 12,500,000 Btu/hr (3 663 388 watts) or less shall meet the requirements of ASME CSD-1. Gas-fired boilers shall conform to the requirements listed in Chapter 24.

M2001.2 Clearance. Boilers shall be installed in accordance with their *listing* and *label*.

M2001.3 Valves. Every boiler or modular boiler shall have a shutoff valve in the supply and return piping. For multiple boiler or multiple modular boiler installations, each boiler or modular boiler shall have individual shutoff valves in the supply and return piping.

Exception: Shutoff valves are not required in a system having a single low-pressure steam boiler.

M2001.4 Flood-resistant installation. In flood hazard areas established in Table R301.2(1), boilers, water heaters and their control systems shall be located or installed in accordance with Section R322.1.6.

~~SECTION M2002~~

~~OPERATING AND SAFETY CONTROLS~~

~~**M2002.1 Safety controls.** Electrical and mechanical operating and safety controls for boilers shall be *listed* and *labeled*.~~

~~**M2002.2 Hot water boiler gauges.** Every hot water boiler shall have a pressure gauge and a temperature gauge, or combination pressure and temperature gauge. The gauges shall indicate the temperature and pressure within the normal range of the system's operation.~~

~~**M2002.3 Steam boiler gauges.** Every steam boiler shall have a water gauge glass and a pressure gauge. The pressure gauge shall indicate the pressure within the normal range of the system's operation. The gauge glass shall be installed so that the midpoint is at the normal water level.~~

~~**M2002.4 Pressure relief valve.** Boilers shall be equipped with pressure relief valves with minimum rated capacities for the *equipment* served. Pressure relief valves shall be set at the maximum rating of the boiler. Discharge shall be piped to drains by gravity to within 18 inches (457 mm) of the floor or to an open receptor.~~

~~**M2002.5 Boiler low water cutoff.** Steam and hot water boilers shall be protected with a low water cutoff control.~~

~~**Exception:** A low water cutoff is not required for coil type and water tube type boilers that require forced circulation of water through the boiler and that are protected with a flow sensing control.~~

~~**M2002.6 Operation.** Low water cutoff controls and flow sensing controls required by Section M2002.5 shall automatically stop the combustion operation of the appliance when the water level~~

drops below the lowest safe water level as established by the manufacturer or when the water circulation flow is less than that required for safe operation of the appliance, respectively.

SECTION M2003

EXPANSION TANKS

M2003.1 General. Hot water boilers shall be provided with expansion tanks. Nonpressurized expansion tanks shall be securely fastened to the structure or boiler and supported to carry twice the weight of the tank filled with water. Provisions shall be made for draining nonpressurized tanks without emptying the system.

M2003.1.1 Pressurized expansion tanks. Pressurized expansion tanks shall be consistent with the volume and capacity of the system. Tanks shall be capable of withstanding a hydrostatic test pressure of two and one-half times the allowable working pressure of the system.

M2003.2 Minimum capacity. The minimum capacity of expansion tanks shall be determined from Table M2003.2.))

((TABLE M2003.2
EXPANSION TANK MINIMUM CAPACITY[a] FOR FORCED HOT-WATER SYSTEMS

SYSTEM VOLUME[b] (gallons)	**PRESSURIZED DIAPHRAGM TYPE**	**NONPRESSURIZED TYPE**
10	1.0	1.5
20	1.5	3.0
30	2.5	4.5
40	3.0	6.0
50	4.0	7.5
60	5.0	9.0
70	6.0	10.5
80	6.5	12.0
90	7.5	13.5
100	8.0	15.0

For SI: 1 gallon = 3.785 L, 1 pound per square inch gauge = 6.895 kPa, °C = [(°F) - 32]/1.8.

~~a. Based on average water temperature of 195°F (91°C), fill pressure of 12 psig and a maximum operating pressure of 30 psig.~~
~~b. System volume includes volume of water in boiler, convectors and piping, not including the expansion tank.~~))

* * *

SECTION M2005

WATER HEATERS

[W]M2005.1 General. Water heaters shall be installed in accordance with Chapter ((~~28~~)) 5 of the *Uniform 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 M1305.1.3. Gas-fired water heaters shall comply with the requirements in Chapter 24. Domestic electric water heaters shall comply with UL 174. Oiled-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.

* * *

Section 20. The following sections of Chapter 21 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 21

HYDRONIC PIPING

SECTION M2101

HYDRONIC PIPING SYSTEMS INSTALLATION

* * *

M2101.3 Protection of potable water. The potable water system shall be protected from backflow in accordance with the provisions listed in Section ((~~P2902~~)) 603 of the *Uniform Plumbing Code*.

* * *

[W]((~~M2101.7 Prohibited tee applications.~~ ~~Fluid in the supply side of a hydronic system shall not enter a tee fitting through the branch opening.~~))

* * *

SECTION M2103

FLOOR HEATING SYSTEMS

* * *

[W]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:

1. Steel pipe joints shall be welded.
2. Copper tubing shall be joined by brazing complying with Section ((~~P3003.6.1~~)) 605.3.1 of the *Uniform 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.

* * *

SECTION M2105

GROUND-SOURCE HEAT-PUMP SYSTEM LOOP PIPING

* * *

[W]M2105.9 CPVC plastic pipe. Joints between CPVC plastic pipe or fittings shall be solvent-cemented in accordance with Section ((~~P2906.9.1.2~~)) 605.2.2 of the *Uniform Plumbing Code*. Threaded joints between fittings and CPVC plastic pipe shall be in accordance with Section M2105.9.1.

* * *

[W]M2105.14 PVC plastic pipe. Joints between PVC plastic pipe or fittings shall be solvent-cemented in accordance with Section ((~~P2906.9.1.4~~)) 605.12.2 of the *Uniform Plumbing Code*. Threaded joints between fittings and PVC plastic pipe shall be in accordance with Section M2105.9.1.

* * *

[W]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 ((~~P2902~~)) 603 of the *Uniform Plumbing Code*.

[W]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 ((~~P2606.1~~)) Section 312 of the *Uniform Plumbing Code*.

* * *

Section 21. The following sections of Chapter 23 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 23

SOLAR THERMAL ENERGY SYSTEMS

SECTION M2301

THERMAL SOLAR ENERGY SYSTEMS

* * *

[W]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 ((~~P2804~~)) 504 of the *Uniform 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.

* * *

[W]M2301.2.5 Piping insulation. Piping shall be insulated in accordance with the requirements of ((~~Chapter 11~~)) the *International Energy Conservation 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.

Exceptions:

1. Those portions of the piping that are used to help prevent the system from overheating shall not be required to be insulated.
2. Those portions of piping that are exposed to solar radiation, made of the same material as the solar collector absorber plate and are covered in the same manner as the solar collector absorber, or that are used to collect additional solar energy, shall not be required to be insulated.
3. Piping in thermal solar systems using unglazed solar collectors to heat a swimming pool shall not be required to be insulated.

* * *

[W]M2301.4 Heat transfer gasses or liquids and heat exchangers. *Essentially toxic transfer fluids*, ethylene glycol, flammable gases and flammable liquids shall not be used as heat transfer fluids. Heat transfer gases 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 ((~~P2902.5.2~~)) 603.5.4 of the *Uniform 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°F (28°C) above the design maximum nonoperating or no-flow temperature attained by the fluid in the collector.

M2301.5 Backflow protection. Connections from the potable water supply to solar systems shall comply with ((~~Section P2902.5.5~~)) the *Uniform Plumbing Code*.

* * *

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 ((~~P2902.5.5~~)) the *Uniform Plumbing Code*.

M2301.7.1 Indirect systems. Heat exchangers that are components of indirect solar thermal heating systems shall comply with ((~~Section P2902.5.2~~)) the *Uniform 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 ((~~29~~)) 6 of the *Uniform Plumbing Code*.

Section 22. Section P2904 of the International Residential Code, 2012 Edition, is adopted as follows:

CHAPTER 29

WATER SUPPLY AND DISTRIBUTION

* * *

SECTION P2904

DWELLING UNIT FIRE SPRINKLER SYSTEMS

P2904.1 General. The design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section P2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and

plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system. A backflow preventer shall not be required to separate a stand-alone sprinkler system from the water distribution system.

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

Exceptions:

1. Attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In *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^2) 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^2) in area.
4. Garages; carports; exterior porches; unheated entry areas, such as mud rooms, that are adjacent to an exterior door; and similar areas.

P2904.2 Sprinklers. Sprinklers shall be new listed residential sprinklers and shall be installed in accordance with the sprinkler manufacturer's installation instructions.

P2904.2.1 Temperature rating and separation from heat sources. Except as provided for in Section P2904.2.2, sprinklers shall have a temperature rating of not less than 135°F (57°C) and not more than 170°F (77°C). Sprinklers shall be separated from heat sources as required by the sprinkler manufacturer's installation instructions.

P2904.2.2 Intermediate temperature sprinklers. Sprinklers shall have an intermediate temperature rating not less than 175°F (79°C) and not more than 225°F (107°C) where installed in the following locations:

1. Directly under skylights, where the sprinkler is exposed to direct sunlight.
2. In *attics*.
3. In concealed spaces located directly beneath a roof.
4. Within the distance to a heat source as specified in Table P2904.2.2

P2904.2.3 Freezing areas. Piping shall be protected from freezing as required by Section P2603.6. Where sprinklers are required in areas that are subject to freezing, dry-sidewall or dry-pendent sprinklers extending from a nonfreezing area into a freezing area shall be installed.

P2904.2.4 Sprinkler coverage. Sprinkler coverage requirements and sprinkler obstruction requirements shall be in accordance with Sections P2904.2.4.1 and P2904.2.4.2.

P2904.2.4.1 Coverage area limit. The area of coverage of a single sprinkler shall not exceed 400 square feet (37 m^2) and shall be based on the sprinkler listing and the sprinkler manufacturer's installation instructions.

P2904.2.4.2 Obstructions to coverage. Sprinkler discharge shall not be blocked by obstructions unless additional sprinklers are installed to protect the obstructed area. Additional sprinklers shall not be required where the sprinkler separation from obstructions complies with either the minimum distance indicated in Figure P2904.2.4.2 or the minimum distances specified in the sprinkler manufacturer's instructions where the manufacturer's instructions permit a lesser distance.

P2904.2.4.2.1 Additional requirements for pendent sprinklers. Pendent sprinklers within 3 feet (915 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

P2904.2.4.2.2 Additional requirements for sidewall sprinklers. Sidewall sprinklers within 5 feet (1524 mm) of the center of a ceiling fan, surface-mounted ceiling luminaire or similar object shall be considered to be obstructed, and additional sprinklers shall be installed.

TABLE P2904.2.2
LOCATIONS WHERE INTERMEDIATE TEMPERATURE SPRINKLERS ARE REQUIRED

HEAT SOURCE	RANGE OF DISTANCE FROM HEAT SOURCE WITHIN WHICH INTERMEDIATE TEMPERATURE SPRINKLERS ARE REQUIRED [a,b] (inches)
Fireplace, side of open or recessed fireplace	12 to 36
Fireplace, front of recessed fireplace	36 to 60
Coal and wood burning stove	12 to 42
Kitchen range top	9 to 18
Oven	9 to 18
Vent connector or chimney connector	9 to 18
Heating duct, not insulated	9 to 18
Hot water pipe, not insulated	6 to 12
Side of ceiling or wall warm air register	12 to 24
Front of wall mounted warm air register	18 to 36
Water heater, furnace or boiler	3 to 6
Luminaire up to 250 watts	3 to 6
Luminaire 250 watts up to 499 watts	6 to 12

For IS: 1 inch .= 25.4 mm.
a. Sprinklers shall not be located at distances less than the minimum table distance unless the sprinkler listing allows a lesser distance.
b. Distances shall be measured in a straight line from the nearest edge of the heat source to the nearest edge of the sprinkler.

P2904.2.5 Sprinkler installation on systems assembled with solvent cement. The solvent cementing of threaded adapter fittings shall be completed and threaded adapters for

sprinklers shall be verified as being clear of excess cement prior to the installation of sprinklers on systems assembled with solvent cement.

P2904.2.6 Sprinkler modifications prohibited. Painting, caulking or modifying of sprinklers shall be prohibited. Sprinklers that have been painted, caulked, modified or damaged shall be replaced with new sprinklers.

P2904.3 Sprinkler piping system. Sprinkler piping shall be supported in accordance with the requirements for cold water distribution piping. Sprinkler piping shall comply with all requirements for cold water distribution piping. For multipurpose pipi ng systems, the sprinkler piping shall connect to and be a part of the cold water distribution piping system.

Exception: For plastic piping, it shall be permissible to follow the manufacturer's installation instructions.

P2904.3.1 Nonmetallic pipe and tubing. Nonmetallic pipe and tubing, such as CPVC, PEX, and PE-RT shall be listed for use in residential fire sprinkler systems.

P2904.3.1.1 Nonmetallic pipe protection. Nonmetallic pipe and tubing systems shall be protected from exposure to the living space by a layer of not less than 3/8-inch-thick (9.5 mm) gypsum wallboard, 1/2-inch-thick (13 mm) plywood, or other material having a 15-minute fire rating.

Exceptions:

1. Pipe protection shall not be required in areas that do not require protection with sprinklers as specified in Section P2904.1.1.
2. Pipe protection shall not be required where exposed piping is permitted by the pipe listing.

P2904.3.2 Shutoff valves prohibited. With the exception of shutoff valves for the entire water distribution system, valves shall not be installed in any location where the valve would isolate piping serving one or more sprinklers.

P2904.3.3 Single dwelling limit. Piping beyond the service valve located at the beginning of the water distribution system shall not serve more than one *dwelling*.

P2904.3.4 Drain. A means to drain the sprinkler system shall be provided on the system side of the water distribution shutoff valve.

P2904.4 Determining system design flow. The flow for sizing the sprinkler piping system shall be based on the flow rating of each sprinkler in accordance with Section P2904.4.1 and the calculation in accordance with Section P2904.4.2.

P2904.4.1 Determining required flow rate for each sprinkler. The minimum required flow for each sprinkler shall be determined using the sprinkler manufacturer's published data for the specific sprinkler model based on all of the following:

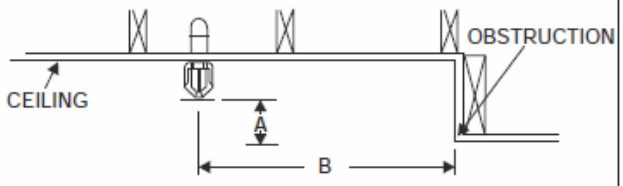
1. The area of coverage.
2. The ceiling configuration.
3. The temperature rating.
4. Any additional conditions specified by the sprinkler manufacturer.

P2904.4.2 System design flow rate. The design flow rate for the system shall be based on the following:

1. The design flow rate for a room having only one sprinkler shall be the flow rate required for that sprinkler, as determined by Section P2904.4.1.

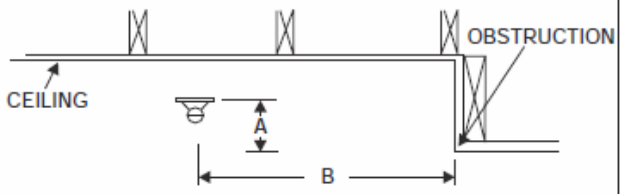
2. The design flow rate for a room having two or more sprinklers a shall be determined by identifying the sprinkler in that room with the highest required flow rate, based on Section P2904.4.1, and multiplying that flow rate by 2.
3. Where the sprinkler manufacturer specifies different criteria for ceiling configurations that are not smooth, flat and horizontal, the required flow rate for that room shall comply with the sprinkler manufacturer's instructions.
4. The design flow rate for the sprinkler system shall be the flow required by the room with the largest flow rate, based on Items 1, 2 and 3.
5. For the purpose of this section, it shall be permissible to reduce the design flow rate for a room by subdividing the space into two or more rooms, where each room is evaluated separately with respect to the required design flow rate. Each room shall be bounded by walls and a ceiling. Openings in walls shall have a lintel not less than 8 inches (203 mm) in depth and each lintel shall form a solid barrier between the ceiling and the top of the opening.

PENDANT SPRINKLER TO SIDE OBSTRUCTION



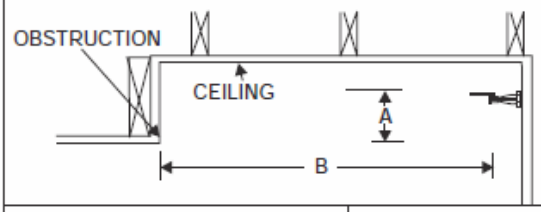
WHERE A IS LESS THAN OR EQUAL TO: (INCHES)	WHERE A IS LESS THAN OR EQUAL TO: (FEET)
1	1½
3	3
5	4
7	4½
9	1½
11	6½
14	7

SIDEWALL SPRINKLER TO SIDE OBSTRUCTION



WHERE A IS LESS THAN OR EQUAL TO: (INCHES)	WHERE A IS LESS THAN OR EQUAL TO: (FEET)
1	1½
3	3
5	4
7	4½
9	6
11	6½
14	7

SIDEWALL SPRINKLER TO FORWARD OBSTRUCTION



WHERE A IS LESS THAN OR EQUAL TO: (INCHES)	WHERE A IS LESS THAN OR EQUAL TO: (FEET)
1	8
2	10
3	11
4	12
6	13
7	14
9	15
11	16
14	17

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

FIGURE P2904.2.4.2
MINIMUM ALLOWABLE DISTANCE BETWEEN SPRINKLER AND OBSTRUCTION

P2904.5 Water supply. The water supply shall provide not less than the required design flow rate for sprinklers in accordance with Section P2904.4.2 at a pressure not less than that used to comply with Section P2904.6.

P2904.5.1 Water supply from individual sources. Where a *dwelling unit* water supply is from a tank system, a private well system or a combination of these, the available water supply shall be based on the minimum pressure control setting for the pump.

P2904.5.2 Required capacity. The water supply shall have the capacity to provide the required design flow rate for sprinklers for a period of time as follows:

1. Seven minutes for *dwelling units* one *story* in height and less than 2,000 square feet (186 m^2) in area.
2. Ten minutes for *dwelling units* two or more stories in height or equal to or greater than 2,000 square feet (186 m^2) in area. Where a well system, a water supply tank system or a combination thereof is used, any combination of well capacity and tank storage shall be permitted to meet the capacity requirement.

P2904.6 Pipe sizing. The piping to sprinklers shall be sized for the flow required by Section P2904.4.2. The flow required to supply the plumbing fixtures shall not be required to be added to the sprinkler design flow.

P2904.6.1 Method of sizing pipe. Piping supplying sprinklers shall be sized using the prescriptive method in Section P2904.6.2 or by hydraulic calculation in accordance with NFPA 13D. The minimum pipe size from the water supply source to any sprinkler shall be 3/4 inch (19 mm) nominal. Threaded adapter fittings at the point where sprinklers are attached to the piping shall be a minimum of 1/2 inch (13 mm) nominal.

P2904.6.2 Prescriptive pipe sizing method. Pipe shall be sized by determining the available pressure to offset friction loss in piping and identifying a piping material, diameter and length using the equation in Section P2904.6.2.1 and the procedure in Section P2904.6.2.2.

P2904.6.2.1 Available pressure equation. The pressure available to offset friction loss in the interior piping system (P_t) shall be determined in accordance with the Equation 29-Section 1.

$$P_t = P_{sup} - PL_{svc} - PL_m - PL_d - PL_e - P_{sp}$$ **(Equation 29-1)**

where:

P_t = Pressure used in applying Tables P2904.6.2(4) through P2904.6.2(9).

P_{sup} = Pressure available from the water supply source.

PL_{svc} = Pressure loss in the water-service pipe.

PL_m = Pressure loss in the water meter.

PL_d = Pressure loss from devices other than the water meter.

PL_e = Pressure loss associated with changes in elevation.

P_{sp} = Maximum pressure required by a sprinkler.

P2904.6.2.2 Calculation procedure. Determination of the required size for water distribution piping shall be in accordance with the following procedure:

Step 1—Determine P_{sup}

Obtain the static supply pressure that will be available from the water main from the water purveyor, or for an individual source, the available supply pressure shall be in accordance with Section P2904.5.1.

Step 2—Determine PL_{svc}

Use Table P2904.6.2(1) to determine the pressure loss in the water service pipe based on the selected size of the water service.

Step 3—Determine PL_m

Use Table P2904.6.2(2) to determine the pressure loss from the water meter, based on the selected water meter size.

Step 4—Determine PL_d

Determine the pressure loss from devices other than the water meter installed in the piping system supplying sprinklers, such as pressure-reducing valves, backflow preventers, water softeners or water filters. Device pressure losses shall be based on the device manufacturer's specifications. The flow rate used to determine pressure loss shall be the rate from Section P2904.4.2, except that 5 gpm (0.3 L/s) shall be added where the device is installed in a water-service pipe that supplies more than one *dwelling*. As alternative to deducting pressure loss for a device, an automatic bypass valve shall be installed to divert flow around the device when a sprinkler activates.

Step 5—Determine PL_e

Use Table P2904.6.2(3) to determine the pressure loss associated with changes in elevation. The elevation used in applying the table shall be the difference between the elevation where the water source pressure was measured and the elevation of the highest sprinkler.

Step 6—Determine P_{sp}

Determine the maximum pressure required by any individual sprinkler based on the flow rate from Section P2904.4.1. The required pressure is provided in the sprinkler manufacturer's published data for the specific sprinkler model based on the selected flow rate.

Step 7—Calculate P_t

Using Equation 29-1, calculate the pressure available to offset friction loss in water-distribution piping between the service valve and the sprinklers.

Step 8—Determine the maximum allowable pipe length

Use Tables P2904.6.2(4) through P2904.6.2(9) to select a material and size for water distribution piping. The piping material and size shall be acceptable if the *developed length* of pipe between the service valve and the most remote sprinkler does not exceed the maximum allowable length specified by the applicable table. Interpolation of P_t between the tabular values shall be permitted. The maximum allowable length of piping and no additional consideration of friction losses associated with pipe fittings shall be in Tables P2904.6.2(4) through P2904.6.2(9) incorporates an adjustment for pipe fittings, required.

TABLE P2904.6.2(1)
WATER SERVICE PRESSURE LOSS (PL_{svc})[a, b]

FLOW RATE[c] (gpm)	3/4-INCH WATER SERVICE PRESSURE LOSS (psi)				1-INCH WATER SERVICE PRESSURE LOSS (psi)				1 1/4-INCH WATER SERVICE PRESSURE LOSS (psi)			
	Length of water service pipe (feet)				Length of water service pipe (feet)				Length of water service pipe (feet)			
	40 or less	41 to 75	76 to 100	101 to 150	40 or less	41 to 75	76 to 100	101 to 150	40 or less	41 to 75	76 to 100	101 to 150
8	5.1	8.7	11.8	17.4	1.5	2.5	3.4	5.1	0.6	1.0	1.3	1.9
10	7.7	13.1	17.8	26.3	2.3	3.8	5.2	7.7	0.8	1.4	2.0	2.9
12	10.8	18.4	24.9	NP	3.2	5.4	7.3	10.7	1.2	2.0	2.7	4.0
14	14.4	24.5	NP	NP	4.2	7.1	9.6	14.3	1.6	2.7	3.6	5.4
16	18.4	NP	NP	NP	5.4	9.1	12.4	18.3	2.0	3.4	4.7	6.9
18	22.9	NP	NP	NP	6.7	11.4	15.4	22.7	2.5	4.3	5.8	8.6
20	27.8	NP	NP	NP	8.1	13.8	18.7	27.6	3.1	5.2	7.0	10.4
22	NP	NP	NP	NP	9.7	16.5	22.3	NP	3.7	6.2	8.4	12.4
24	NP	NP	NP	NP	11.4	19.3	26.2	NP	4.3	7.3	9.9	14.6
26	NP	NP	NP	NP	13.2	22.4	NP	NP	5.0	8.5	11.4	16.9
28	NP	NP	NP	NP	15.1	25.7	NP	NP	5.7	9.7	13.1	19.4
30	NP	NP	NP	NP	17.2	NP	NP	NP	6.5	11.0	14.9	22.0
32	NP	NP	NP	NP	19.4	NP	NP	NP	7.3	12.4	16.8	24.8
34	NP	NP	NP	NP	21.7	NP	NP	NP	8.2	13.9	18.8	NP
36	NP	NP	NP	NP	24.1	NP	NP	NP	9.1	15.4	20.9	NP

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 gallon per minute = 0.063 L/s, 1 pound per square inch = 6.895 kPa.
NP = Not permitted. Pressure loss exceeds reasonable limits.
a. Values are applicable for underground piping materials listed in Table P2905.4 and are based on an SDR of 11 and a Hazen Williams C Factor of 150.
b. Values include the following length allowances for fittings: 25% length increase for actual lengths up to 100 feet and 15% length increase for actual lengths over 100 feet.
c. Flow rate from Section P2904.4.2. Add 5 gpm to the flow rate required by Section P2904.4.2 where the water-service pipe supplies more than one dwelling.

TABLE P2904.6.2(2)
MINIMUM WATER METER PRESSURE LOSS (PL_m)[a]

FLOW RATE (gallons per minute, gpm)[b]	5/8-INCH METER PRESSURE LOSS (pounds per square inch, psi)	3/4-INCH METER PRESSURE LESS (pounds per square inch, psi)	1-INCH METER PRESSURE LOSS (pounds per square inch, psi)
8	2	1	1
10	3	1	1
12	4	1	1
14	5	2	1
16	7	3	1
18	9	4	1
20	11	4	2
22	NP	5	2
24	NP	5	2
26	NP	6	2
28	NP	6	2
30	NP	7	2
32	NP	7	3
34	NP	8	3
36	NP	8	3

For SI: 1 inch = 25.4 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.063 L/s.
NP—Not permitted unless the actual water meter pressure loss is known.
a. Table P2904.6.2(2) establishes conservative values for water meter pressure loss or installations where the water meter loss is unknown. Where the actual water meter pressure loss is known, P_m shall be the actual loss.
b. Flow rate from Section P2904.4.2. Add 5 gpm to the flow rate required by Section P2904.4.2 where the water-service pipe supplies more than one dwelling.

1

TABLE P2904.6.2(3)
ELEVATION LOSS (PL_e)

ELEVATION (feet)	PRESSURE LOSS (psi)
5	2.2
10	4.4
15	6.5
20	8.7
25	10.9
30	13
35	15.2
40	17.4

For SI: 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa.

2

3

TABLE P2904.6.2(4)
ALLOWABLE PIPE LENGTH FOR 3/4-INCH TYPE M COPPER WATER TUBING

SPRINKLER FLOW RATE[a] (gpm)	WATER DISTRIBUTION SIZE (inch)	AVAILABLE PRESSURE—P_r (psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	3/4	217	289	361	434	506	578	650	723	795	867
9	3/4	174	232	291	349	407	465	523	581	639	697
10	3/4	143	191	239	287	335	383	430	478	526	574
11	3/4	120	160	200	241	281	321	361	401	441	481
12	3/4	102	137	171	205	239	273	307	341	375	410
13	3/4	88	118	147	177	206	235	265	294	324	353
14	3/4	77	103	128	154	180	205	231	257	282	308
15	3/4	68	90	113	136	158	181	203	226	248	271
16	3/4	60	80	100	120	140	160	180	200	220	241
17	3/4	54	72	90	108	125	143	161	179	197	215
18	3/4	48	64	81	97	113	129	145	161	177	193
19	3/4	44	58	73	88	102	117	131	146	160	175
20	3/4	40	53	66	80	93	106	119	133	146	159
21	3/4	36	48	61	73	85	97	109	121	133	145
22	3/4	33	44	56	67	78	89	100	111	122	133
23	3/4	31	41	51	61	72	82	92	102	113	123
24	3/4	28	38	47	57	66	76	85	95	104	114
25	3/4	26	35	44	53	61	70	79	88	97	105
26	3/4	24	33	41	49	57	65	73	82	90	98
27	3/4	23	30	38	46	53	61	69	76	84	91
28	3/4	21	28	36	43	50	57	64	71	78	85
29	3/4	20	27	33	40	47	53	60	67	73	80
30	3/4	19	25	31	38	44	50	56	63	69	75
31	3/4	18	24	29	35	41	47	53	59	65	71
32	3/4	17	22	28	33	39	44	50	56	61	67
33	3/4	16	21	26	32	37	42	47	53	58	63
34	3/4	NP	20	25	30	35	40	45	50	55	60
35	3/4	NP	19	24	28	33	38	42	47	52	57
36	3/4	NP	18	22	27	31	36	40	45	49	54
37	3/4	NP	17	21	26	30	34	38	43	47	51
38	3/4	NP	16	20	24	28	32	36	40	45	49
39	3/4	NP	15	19	23	27	31	35	39	42	46
40	3/4	NP	NP	18	22	26	29	33	37	40	44

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
NP—Not permitted
a. Flow rate from Section P2904.4.2.

1

TABLE P2904.6.2(5)
ALLOWABLE PIPE LENGTH FOR 1-INCH TYPE M COPPER WATER TUBING

SPRINKLER FLOW RATE[a] (gpm)	WATER DISTRIBUTION SIZE (inch)	AVAILABLE PRESSURE—P_1(psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	1	806	1075	1343	1612	1881	2149	2418	2687	2955	3224
9	1	648	864	1080	1296	1512	1728	1945	2161	2377	2593
10	1	533	711	889	1067	1245	1422	1600	1778	1956	2134
11	1	447	586	745	894	1043	1192	1341	1491	1640	1789
12	1	381	508	634	761	888	1015	1142	1269	1396	1523
13	1	328	438	547	657	766	875	985	1094	1204	1313
14	1	286	382	477	572	668	763	859	954	1049	1145
15	1	252	336	420	504	588	672	756	840	924	1008
16	1	224	298	373	447	522	596	671	745	820	894
17	1	200	266	333	400	466	533	600	666	733	799
18	1	180	240	300	360	420	479	539	599	659	719
19	1	163	217	271	325	380	434	488	542	597	651
20	1	148	197	247	296	345	395	444	493	543	592
21	1	135	180	225	270	315	360	406	451	496	541
22	1	124	165	207	248	289	331	372	413	455	496
23	1	114	152	190	228	267	305	343	381	419	457
24	1	106	141	176	211	246	282	317	352	387	422
25	1	98	131	163	196	228	261	294	326	359	392
26	1	91	121	152	182	212	243	273	304	334	364
27	1	85	113	142	170	198	226	255	283	311	340
28	1	79	106	132	159	185	212	238	265	291	318
29	1	74	99	124	149	174	198	223	248	273	298
30	1	70	93	116	140	163	186	210	233	256	280
31	1	66	88	110	132	153	175	197	219	241	263
32	1	62	83	103	124	145	165	186	207	227	248
33	1	59	78	98	117	137	156	176	195	215	234
34	1	55	74	92	111	129	148	166	185	203	222
35	1	53	70	88	105	123	140	158	175	193	210
36	1	50	66	83	100	116	133	150	166	183	199
37	1	47	63	79	95	111	126	142	158	174	190
38	1	45	60	75	90	105	120	135	150	165	181
39	1	43	57	72	86	100	115	129	143	158	172
40	1	41	55	68	82	96	109	123	137	150	164

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
a. Flow rate from Section P2904.4.2.

1

TABLE P2904.6.2(6)
ALLOWABLE PIPE LENGTH FOR ¾-INCH CPVC PIPE

SPRINKLER FLOW RATE* (gpm)	WATER DISTRIBUTION SIZE (Inch)	AVAILABLE PRESSURE—P_r (psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	¾	348	465	581	697	813	929	1045	1161	1278	1394
9	¾	280	374	467	560	654	747	841	934	1027	1121
10	¾	231	307	384	461	538	615	692	769	845	922
11	¾	193	258	322	387	451	515	580	644	709	773
12	¾	165	219	274	329	384	439	494	549	603	658
13	¾	142	189	237	284	331	378	426	473	520	568
14	¾	124	165	206	247	289	330	371	412	454	495
15	¾	109	145	182	218	254	290	327	363	399	436
16	¾	97	129	161	193	226	258	290	322	354	387
17	¾	86	115	144	173	202	230	259	288	317	346
18	¾	78	104	130	155	181	207	233	259	285	311
19	¾	70	94	117	141	164	188	211	234	258	281
20	¾	64	85	107	128	149	171	192	213	235	256
21	¾	58	78	97	117	136	156	175	195	214	234
22	¾	54	71	89	107	125	143	161	179	197	214
23	¾	49	66	82	99	115	132	148	165	181	198
24	¾	46	61	76	91	107	122	137	152	167	183
25	¾	42	56	71	85	99	113	127	141	155	169
26	¾	39	52	66	79	92	105	118	131	144	157
27	¾	37	49	61	73	86	98	110	122	135	147
28	¾	34	46	57	69	80	92	103	114	126	137
29	¾	32	43	54	64	75	86	96	107	118	129
30	¾	30	40	50	60	70	81	91	101	111	121
31	¾	28	38	47	57	66	76	85	95	104	114
32	¾	27	36	45	54	63	71	80	89	98	107
33	¾	25	34	42	51	59	68	76	84	93	101
34	¾	24	32	40	48	56	64	72	80	88	96
35	¾	23	30	38	45	53	61	68	76	83	91
36	¾	22	29	36	43	50	57	65	72	79	86
37	¾	20	27	34	41	48	55	61	68	75	82
38	¾	20	26	33	39	46	52	59	65	72	78
39	¾	19	25	31	37	43	50	56	62	68	74
40	¾	18	24	30	35	41	47	53	59	65	71

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
a. Flow rate from Section P2904.4.2.

1

TABLE P2904.6.2(7)
ALLOWABLE PIPE LENGTH FOR 1-INCH CPVC PIPE

SPRINKLER FLOW RATE* (gpm)	WATER DISTRIBUTION SIZE (inch)	AVAILABLE PRESSURE—P_i(psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	1	1049	1398	1748	2098	2447	2797	3146	3496	3845	4195
9	1	843	1125	1406	1687	1968	2249	2530	2811	3093	3374
10	1	694	925	1157	1388	1619	1851	2082	2314	2545	2776
11	1	582	776	970	1164	1358	1552	1746	1940	2133	2327
12	1	495	660	826	991	1156	1321	1486	1651	1816	1981
13	1	427	570	712	854	997	1139	1281	1424	1566	1709
14	1	372	497	621	745	869	993	1117	1241	1366	1490
15	1	328	437	546	656	765	874	983	1093	1202	1311
16	1	291	388	485	582	679	776	873	970	1067	1164
17	1	260	347	433	520	607	693	780	867	954	1040
18	1	234	312	390	468	546	624	702	780	858	936
19	1	212	282	353	423	494	565	635	706	776	847
20	1	193	257	321	385	449	513	578	642	706	770
21	1	176	235	293	352	410	469	528	586	645	704
22	1	161	215	269	323	377	430	484	538	592	646
23	1	149	198	248	297	347	396	446	496	545	595
24	1	137	183	229	275	321	366	412	458	504	550
25	1	127	170	212	255	297	340	382	425	467	510
26	1	118	158	197	237	276	316	355	395	434	474
27	1	111	147	184	221	258	295	332	368	405	442
28	1	103	138	172	207	241	275	310	344	379	413
29	1	97	129	161	194	226	258	290	323	355	387
30	1	91	121	152	182	212	242	273	303	333	364
31	1	86	114	143	171	200	228	257	285	314	342
32	1	81	108	134	161	188	215	242	269	296	323
33	1	76	102	127	152	178	203	229	254	280	305
34	1	72	96	120	144	168	192	216	240	265	289
35	1	68	91	114	137	160	182	205	228	251	273
36	1	65	87	108	130	151	173	195	216	238	260
37	1	62	82	103	123	144	165	185	206	226	247
38	1	59	78	98	117	137	157	176	196	215	235
39	1	56	75	93	112	131	149	168	187	205	224
40	1	53	71	89	107	125	142	160	178	196	214

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
a. Flow rate from Section P2904.4.2.

1

TABLE P2904.6.2(8)
ALLOWABLE PIPE LENGTH FOR ¾-INCH PEX AND PE-RT TUBING

SPRINKLER FLOW RATE* (gpm)	WATER DISTRIBUTION SIZE (inch)	AVAILABLE PRESSURE—P_a (psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	¾	93	123	154	185	216	247	278	309	339	370
9	¾	74	99	124	149	174	199	223	248	273	298
10	¾	61	82	102	123	143	163	184	204	225	245
11	¾	51	68	86	103	120	137	154	171	188	205
12	¾	44	58	73	87	102	117	131	146	160	175
13	¾	38	50	63	75	88	101	113	126	138	151
14	¾	33	44	55	66	77	88	99	110	121	132
15	¾	29	39	48	58	68	77	87	96	106	116
16	¾	26	34	43	51	60	68	77	86	94	103
17	¾	23	31	38	46	54	61	69	77	84	92
18	¾	21	28	34	41	48	55	62	69	76	83
19	¾	19	25	31	37	44	50	56	62	69	75
20	¾	17	23	28	34	40	45	51	57	62	68
21	¾	16	21	26	31	36	41	47	52	57	62
22	¾	NP	19	24	28	33	38	43	47	52	57
23	¾	NP	17	22	26	31	35	39	44	48	52
24	¾	NP	16	20	24	28	32	36	40	44	49
25	¾	NP	NP	19	22	26	30	34	37	41	45
26	¾	NP	NP	17	21	24	28	31	35	38	42
27	¾	NP	NP	16	20	23	26	29	33	36	39
28	¾	NP	NP	15	18	21	24	27	30	33	36
29	¾	NP	NP	NP	17	20	23	26	28	31	34
30	¾	NP	NP	NP	16	19	21	24	27	29	32
31	¾	NP	NP	NP	15	18	20	23	25	28	30
32	¾	NP	NP	NP	NP	17	19	21	24	26	28
33	¾	NP	NP	NP	NP	16	18	20	22	25	27
34	¾	NP	NP	NP	NP	NP	17	19	21	23	25
35	¾	NP	NP	NP	NP	NP	16	18	20	22	24
36	¾	NP	NP	NP	NP	NP	15	17	19	21	23
37	¾	NP	NP	NP	NP	NP	NP	16	18	20	22
38	¾	NP	NP	NP	NP	NP	NP	16	17	19	21
39	¾	NP	NP	NP	NP	NP	NP	NP	16	18	20
40	¾	NP	NP	NP	NP	NP	NP	NP	16	17	19

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
NP— Not permitted.
a. Flow rate from Section P2904.4.2.

1

TABLE P2904.6.2(9)
ALLOWABLE PIPE LENGTH FOR 1-INCH PEX AND PE-RT TUBING

SPRINKLER FLOW RATE* (gpm)	WATER DISTRIBUTION SIZE (inch)	AVAILABLE PRESSURE—P_i (psi)									
		15	20	25	30	35	40	45	50	55	60
		Allowable length of pipe from service valve to farthest sprinkler (feet)									
8	1	314	418	523	628	732	837	941	1046	1151	1255
9	1	252	336	421	505	589	673	757	841	925	1009
10	1	208	277	346	415	485	554	623	692	761	831
11	1	174	232	290	348	406	464	522	580	638	696
12	1	148	198	247	296	346	395	445	494	543	593
13	1	128	170	213	256	298	341	383	426	469	511
14	1	111	149	186	223	260	297	334	371	409	446
15	1	98	131	163	196	229	262	294	327	360	392
16	1	87	116	145	174	203	232	261	290	319	348
17	1	78	104	130	156	182	208	233	259	285	311
18	1	70	93	117	140	163	187	210	233	257	280
19	1	63	84	106	127	148	169	190	211	232	253
20	1	58	77	96	115	134	154	173	192	211	230
21	1	53	70	88	105	123	140	158	175	193	211
22	1	48	64	80	97	113	129	145	161	177	193
23	1	44	59	74	89	104	119	133	148	163	178
24	1	41	55	69	82	96	110	123	137	151	164
25	1	38	51	64	76	89	102	114	127	140	152
26	1	35	47	59	71	83	95	106	118	130	142
27	1	33	44	55	66	77	88	99	110	121	132
28	1	31	41	52	62	72	82	93	103	113	124
29	1	29	39	48	58	68	77	87	97	106	116
30	1	27	36	45	54	63	73	82	91	100	109
31	1	26	34	43	51	60	68	77	85	94	102
32	1	24	32	40	48	56	64	72	80	89	97
33	1	23	30	38	46	53	61	68	76	84	91
34	1	22	29	36	43	50	58	65	72	79	86
35	1	20	27	34	41	48	55	61	68	75	82
36	1	19	26	32	39	45	52	58	65	71	78
37	1	18	25	31	37	43	49	55	62	68	74
38	1	18	23	29	35	41	47	53	59	64	70
39	1	17	22	28	33	39	45	50	56	61	67
40	1	16	21	27	32	37	43	48	53	59	64

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1 gallon per minute = 0.963 L/s.
a. Flow rate from Section P2904.4.2.

P2904.7 Instructions and signs. An owner's manual for the fire sprinkler system shall be provided to the owner. A sign or valve tag shall be installed at the main shutoff valve to the water distribution system stating the following: "Warning, the water system for this home supplies fire sprinklers that require certain flows and pressures to fight a fire. Devices that restrict the flow or decrease the pressure or automatically shut off the water to the fire sprinkler system, such as water softeners, filtration systems and automatic shutoff valves, shall not be added to this system without a review of the fire sprinkler system by a fire protection specialist. Do not remove this sign."

P2904.8 Inspections. The water distribution system shall be inspected in accordance with Sections P2904.8.1 and P2904.8.2.

P2904.8.1 Preconcealment inspection. The following items shall be verified prior to the concealment of any sprinkler system piping:

1. Sprinklers are installed in all areas as required by Section P2904.1.1.
2. Where sprinkler water spray patterns are obstructed by construction features, luminaires or ceiling fans, additional sprinklers are installed as required by Section P2904.2.4.2.
3. Sprinklers are the correct temperature rating and are installed at or beyond the required separation distances from heat sources as required by Sections P2904.2.1 and P2904.2.2.
4. The pipe size equals or exceeds the size used in applying Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, the size used in the hydraulic calculation.
5. The pipe length does not exceed the length permitted by Tables P2904.6.2(4) through P2904.6.2(9) or, if the piping system was hydraulically calculated in accordance with Section P2904.6.1, pipe lengths and fittings do not exceed those used in the hydraulic calculation.
6. Nonmetallic piping that conveys water to sprinklers is listed for use with fire sprinklers.
7. Piping is supported in accordance with the pipe manufacturer's and sprinkler manufacturer's installation instructions.
8. The piping system is tested in accordance with Section P2503.7.

P2904.8.2 Final inspection. The following items shall be verified upon completion of the system:

1. Sprinkler are not painted, damaged or otherwise hindered from operation.
2. Where a pump is required to provide water to the system, the pump starts automatically upon system water demand.
3. Pressure-reducing valves, water softeners, water filters or other impairments to water flow that were not part of the original design have not been installed.
4. The sign or valve tag required by Section P2904.7 is installed and the owner's manual for the system is present.

* * *

Section 23. The following sections of Chapter 44 of the International Residential Code, 2015 Edition, are amended as follows:

CHAPTER 44

REFERENCED STANDARDS

ASTM

Standard reference number	Title	Referenced in code section number
E336-14	Standard Test Method for Measurement of Airborne Sound Attenuation Between Rooms in Buildings	R331

GA

Standard reference number	Title	Referenced in code section number
GA-600-15	Fire Resistance Design Manual	R331

NFPA

Standard reference number	Title	Referenced in code section number
54-15	National Fuel Gas Code	M1001, M1201,

Section 24. The following findings of fact are adopted in accordance with Washington Administrative Code 51-04-030 in support of amendments to Appendix U:

- Seattle's Comprehensive Plan Climate Policies encourage the use of low-carbon energy sources, in order to reduce greenhouse gas emissions;
- Through Resolution 31312, Seattle has adopted a climate protection goal to reduce energy use in residential buildings by 20% by 2030, and to become fully carbon neutral by 2050;
- Seattle carbon neutrality goals for buildings can only be achieved through the use of renewable energy sources;
- The Seattle Construction Codes Advisory Board requested modifications to Appendix U because these modifications clarify the requirements and allow for greater design flexibility;
- Modifications to Appendix U do not increase the cost of construction, and in some instances may reduce the cost of compliance; and

- Modifications to Appendix U do not increase the cost of enforcement provided by the Seattle Department of Construction and Inspections.

Section 25. The following sections of Appendix U of the International Residential Code, 2015 Edition, are amended as follows:

APPENDIX U will go into effect upon approval by the Washington State Building Code Council.

APPENDIX U—SOLAR-READY PROVISIONS-DETACHED ONE-AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES).

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

U101 Scope.

U101.1 General. ((~~These provisions shall be applicable for new construction where solar-ready provisions are required.~~)) New one- and two-family dwellings shall be provided with a *solar-ready zone* of not less than 300 square feet. Townhouses shall be provided with a *solar-ready zone* of not less than 150 square feet for each dwelling unit.

Exception: The following do not require *solar-ready zones*:

1. One- and two-family dwellings with less than 600 square feet of qualifying roof area conforming to the requirements of Section U101.1.1.
2. Individual units within townhouse buildings that have less than 300 square feet of qualifying roof area per unit conforming to the requirements of Section U101.1.1.
3. Buildings with permanently installed on-site renewable energy systems.

U101.1.1 General. Qualifying roof area includes all roof areas other than the following:

1. Roof areas oriented within 45 degrees of true north and having slopes greater than 2:12.

2. Roof areas shaded by existing land forms, structures or trees for more than 70 percent of daylight hours annually. Shading from future tree growth need not be considered.

3. Roof areas consisting of skylights, occupied decks, or planted areas.

4. Access or set-back areas required by this code or the applicable provisions of the *International Fire Code*.

U102 General definitions. Solar-ready zone. A section or sections of the roof or building overhang designated and reserved for the future installation of a solar photovoltaic panels ((~~or solar water-heating system~~)).

U103 Solar ready zone.

U103.1 General. The solar-ready zone shall comply with Sections U103.1.1 through U103.1.3 ((~~New detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m^2) of roof area oriented between 90 degrees and 270 degrees of true north shall comply with Sections U103.2 through U103.10.~~

~~Exceptions:~~

~~1. New residential buildings with a permanently installed on-site renewable energy system.~~

~~2. A building where all areas of the roof that would otherwise meet the requirements of Section U103 are in full or partial shade for more than 70 percent of daylight hours annually.~~))

~~**U103.2 Construction document requirements for solar ready zone.** Construction documents shall indicate the solar ready zone.~~))

((~~U103.3~~)) U103.1.1 Solar-ready zone area. The ((~~total~~)) *solar-ready zone* may be comprised of one single area or of multiple separated areas. No *solar-ready* zone shall be less than 5 feet in any dimension nor less than 80 square feet of contiguous area ((~~area shall be not less than 300 square feet (27.87 m2) exclusive of mandatory access or set back areas as required by this code. New multiple single-family dwellings (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 m2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m2). 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 m2) 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~~)).

((~~U103.4~~)) U103.1.2 Obstructions and shadows. The ((~~Solar-ready zones~~))*solar-ready zone* shall be free from obstructions including, but not limited to, vents, *chimneys*, and roof-mounted equipment. Permanently installed objects adjacent to the *solar-ready zone* shall be located so that they do not cast shadows on the *solar-ready zone* when the sun is directly east, west, or south of the *solar-ready zone* at 45 degrees above the horizon. Such objects include but are not limited to taller portions of the building, parapets, chimneys, antennas, rooftop equipment, trees, and roof plantings. Shading from future tree growth need not be considered.

U103.1.3 Structural support. The supporting structure of the solar-ready zone shall be designed in accordance with Section R324.4, using a minimum of 4 pounds per square foot as an assumed photovoltaic panel weight.

((**U103.5 Shading.** The solar-ready zone shall be set back from any existing or new permanently affixed object on the building or site that is located south, east, or west of the solar zone a distance at least two times the object's height above the nearest point on the roof surface. Such objects include, but are not limited to, taller portions of the building itself, parapets, chimneys, antennas, signage, rooftop equipment, trees and roof plantings.

U103.6 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.

U103.7 Roof load documentation. The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

U103.8 Interconnection pathway. Construction documents shall indicate pathways for routing of conduit or plumbing from the solar-ready zone to the electrical service panel or service hot water system.))

((**U103.9**)) **U103.2Electrical service reserved space.** The main electrical service or feeder panel for each dwelling unit shall have a reserved space to allow installation of a dual pole circuit breaker for future solar electric installation and shall be labeled "For Future Solar Electric." ((The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location.))

((~~U103.10~~))U103.3 Posted certificate ((~~Construction documentation certificate~~)). A permanent certificate, indicating the boundaries and structural provisions of the *solar-ready zone* ((~~and other requirements of this section~~)), shall be posted near the electrical distribution panel, water heater or other conspicuous location ((~~by the builder or registered design professional~~)).

U103.4 Construction documents. Construction documents shall indicate the boundaries and the assumed photovoltaic panel weight used for design in Section U103.4 for the *solar-ready zone*.

Section 26. Sections 2 through 20 of Ordinance 124282 are repealed.

Section 27. Beginning on the effective date of this ordinance and ending on January 1, 2017, permit applicants who submit a valid and fully complete building permit application during that period may elect to have the application reviewed under the provisions of Ordinance 124282 rather than this ordinance.

Section 28. The provisions of this ordinance are declared to be separate and severable. The invalidity of any clause, sentence, paragraph, subdivision, section, or portion of this ordinance, or the invalidity of the application thereof to any person, owner, or circumstance shall not affect the validity of the remainder of this ordinance, or the validity of its application to other persons, owners, or circumstances.

Section 29. Section 26 of this ordinance shall take effect January 1, 2017.

Section 30. This ordinance shall take effect and be in force 30 days after its approval by the Mayor, but if not approved and returned by the Mayor within ten days after presentation, it shall take effect as provided by Seattle Municipal Code Section 1.04.020.

Passed by the City Council the _____ day of _____, 2016, and signed by me in open session in authentication of its passage this _____ day of _____, 2016.

_____

President _____ of the City Council

Approved by me this _____ day of _____, 2016.

_____

Edward B. Murray, Mayor

Filed by me this _____ day of _____, 2016.

_____

Monica Martinez Simmons, City Clerk

(Seal)