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

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

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

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

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

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

Exceptions:

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

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

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

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

DESIGNATED AREAS are those areas designated by a county to be an urban growth area in Chapter 36.70A RCW and those areas designated by the US Environmental Protection Agency as being in nonattainment for particulate matter.

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

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

R303.10.3 Solid fuel burning devices. No new or used solid fuel burning device shall be installed in new or existing buildings unless such device is 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.

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

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

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

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

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

1. The solar photovoltaic panel system shall be designed for the wind speed of the local area, and shall be installed per the manufacturer's specifications.
2. The ground snow load does not exceed 70 pounds per square foot.
3. The total dead load of modules, supports, mountings, raceways, and all other appurtenances weigh no more than 4 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.

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R324.7.1 Fire separation distance. This section is not adopted.

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R325.6 Habitable attics. This section is not adopted.

SECTION R326
HABITABLE ATTICS

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

R326.2 Minimum dimensions. A *habitable attic* shall have a minimum floor area in accordance with Section R304 and a ceiling height in accordance with Section R305.

R326.3 Story above grade plane. A *habitable attic* shall be considered a story above grade plane.

Exception: A *habitable attic* shall not be considered a story above grade plane provided that the *habitable attic* meets all of the following requirements:

1. The aggregate area of the *habitable attic* is not greater than one-half of the floor area of the story below.
2. The *habitable attic* is located within a dwelling unit equipped with a fire sprinkler system in accordance with Section P2904 or NFPA 13D.
3. The occupiable space is enclosed by the roof assembly above, knee walls (if applicable) on the sides and the floor-ceiling assembly below.
4. The floor of the *habitable attic* shall not extend beyond the exterior walls of the story below.

R326.4 Means of egress. The means of egress for habitable attics shall comply with the applicable provisions of Section R311.

SECTION R327
SLEEPING LOFTS

R327.1 General. *Sleeping lofts* shall comply with Sections R327.2 through R327.5.

R327.2 Sleeping loft area and dimensions. *Sleeping lofts* shall meet the minimum area and dimension requirements of Sections R327.2.1 through R327.2.3.

R327.2.1 Area. *Sleeping lofts* shall have a floor area of not less than 35 square feet (3.25 m2) and less than 70 square feet (6.5 m2).

R327.2.2 Minimum horizontal dimensions. *Sleeping lofts* shall be not less than 5 feet (1524 mm) in any horizontal dimension.

R327.2.3 Height effect on sleeping loft area. Portions of a *sleeping loft* with a sloped ceiling measuring less than 3 feet (914 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the loft but shall contribute to the maximum allowable area.

Exception: Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50 percent slope), portions of a *sleeping loft* with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the *sleeping loft* but shall contribute to the maximum allowable area.

R327.3 Sleeping loft access and egress. The access to and primary egress from *sleeping lofts* shall be of any type described in Sections R327.3.1 through R327.3.5 and shall meet the *sleeping loft* where the *sleeping loft's* ceiling height is not less than 3 feet (914 mm) along the entire width of the access and egress component.

R327.3.1 Stairways. Stairways accessing *sleeping lofts* shall comply with Sections R327.3.1.1 through R327.3.1.7.

R327.3.1.1 Headroom. The headroom above the *sleeping loft* access and egress shall be not less than 6 feet 2 inches (1880 mm), as measured vertically, from a sloped line connecting the tread, landing, or landing platform nosing's in the center of their width, and vertically from the landing or landing platform along the center of its width.

R327.3.1.2 Width. Stairways accessing a *sleeping loft* shall not be less than 17 inches (432 mm) in clear width at or above the handrail. The width below the handrail shall be not less than 20 inches (508 mm).

R327.3.1.3 Treads and risers. Risers for stairs accessing a *sleeping loft* shall be not less than 7 inches (178 mm) and not more than 12 inches (305 mm) in height. Tread depth and riser height shall be calculated in accordance with one of the following formulas:

1. Under gable roofs with a minimum slope of 6 units vertical in 12 units horizontal (50 percent slope), portions of a sleeping loft with a sloped ceiling measuring less than 16 inches (406 mm) from the finished floor to the finished ceiling shall not be considered as contributing to the minimum required area for the sleeping loft but shall contribute to the maximum allowable area.
2. The tread depth shall be 20 inches (508 mm) minus four-thirds of the riser height.

(Replaces Page 87)

R327.3.1.4 Landings. Intermediate landings and landings at the bottom of stairways shall comply with Section R311.7.6, except that the depth in the direction of travel shall be not less than 24 inches (508 mm).

R327.3.1.5 Landing platforms. The top tread and riser of stairways accessing *sleeping lofts* shall be constructed as a landing platform where the loft ceiling height is less than 6 feet 2 inches (1880 mm) where the stairway meets the *sleeping loft*. The landing platform shall be not less than 18 inches (508 mm) in width and in depth measured horizontally from and perpendicular to the nosing of the landing platform. The landing platform riser height to the edge of the *sleeping loft* floor, shall not be greater than 18 inches (406 to 457 mm) in height.

R327.3.1.6 Handrails. Handrails shall comply with Section R311.7.8.

R327.3.1.7 Stairway guards. Guards at open sides of stairways, landings and landing platforms shall comply with Section R312.1.

R327.3.2 Ladders. Ladders accessing *sleeping lofts* shall comply with Sections R326.3.2.1 and R326.3.2.2.

R327.3.2.1 Size and capacity. Ladders accessing *sleeping lofts* shall have a rung width of not less than 12 inches (305 mm), and 10 inch (254 mm) to 14 inch (356 mm) spacing between rungs. Ladders shall be capable of supporting a 300 pound (136 kg) load on any rung. Rung spacing shall be uniform within 3/8 inch (9.5 mm).

R327.3.2.2 Incline. Ladders shall be installed at 70 to 80 degrees from horizontal.

R327.3.3 Alternating tread devices. Alternating tread devices accessing *sleeping lofts* shall comply with Sections R311.7.11.1 and R311.7.11.2. The clear width at and below the handrails shall be not less than 20 inches (508 mm).

R327.3.4 Ships ladders. Ships ladders accessing *sleeping lofts* shall comply with Sections R311.7.12.1 and R311.7.12.2. The clear width at and below handrails shall be not less than 20 inches (508 mm).

R327.4 Sleeping loft guards. *Sleeping loft* guards shall be located along the open side(s) of *sleeping lofts*. *Sleeping loft* guards shall be not less than 36 inches (914 mm) in height or one-half of the clear height to the ceiling, whichever is less. *Sleeping loft* guards shall comply with Section R312.1.3 and Table R301.5 for their components.

R327.5 Emergency escape and rescue openings. An *egress roof access window* shall be installed in each *sleeping loft* and shall be deemed to meet the requirements of Section R310 where installed such that the bottom of the opening is not more than 44 inches (1118 mm) above the *sleeping loft* floor, provided the egress roof access window complies with the minimum opening area requirements of Section R310.2.1.

SECTION R328
SWIMMING POOLS, SPAS AND HOT TUBS

R328.1 General. The design and construction of swimming pools, spas and other aquatic recreation facilities shall comply with the 2018 International Swimming Pool and Spa Code, if the facility is one of the following:

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

SECTION R329
ENERGY STORAGE SYSTEMS

R329.1 General. *Energy storage systems* (ESS) shall comply with the provisions of this section.

R329.2 Equipment listings. ESS shall be *listed* and *labeled* for residential use in accordance with UL 9540.

Exceptions:

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

R329.3 Installation. ESS shall be installed in accordance with the manufacturer's instructions and their listing, if applicable, and shall not be installed within the habitable space of a *dwelling unit*.

R329.4 Electrical installation. ESS shall be installed in accordance with NFPA 70. Inverters shall be *listed* and *labeled* in accordance with UL 1741 or provided as part of the UL 9540 listing. Systems connected to the utility grid shall use inverters listed for utility interaction.

R329.5 Ventilation. Indoor installations of ESS that include batteries that produce hydrogen or other flammable gases during charging shall be provided with ventilation in accordance with Section M1307.4.

(Replaces Page 88)

TABLE R507.3.1
MINIMUM FOOTING SIZE FOR DECKS

Live or Ground Snow Load[b] (psf)	Tributary area[c] (sq.ft.)	Soil Bearing Capacity[a,c,d]								
		1500 psf			2000 psf			≥ 3000 psf		
		Side of a square footing (inches)	Diameter of a round footing (inches)	Thickness[f] (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thicknessf (inches)	Side of a square footing (inches)	Diameter of a round footing (inches)	Thicknessf (inches)
60 Live or 70 Ground Snow Load	5	7	8	6	7	8	6	7	8	6
	20	12	14	6	11	13	6	9	10	6
	40	18	20	6	15	17	6	12	14	6
	60	21	24	8	19	21	6	15	17	6
	80	25	28	9	21	24	8	18	20	6
	100	28	31	11	24	27	9	20	22	7
	120	30	34	12	26	30	10	21	24	8
	140	33	37	13	28	32	11	23	26	9
	160	35	40	15	30	34	12	25	28	9

For SI: 1 inch = 25.4 mm, 1 square foot = 0.0929 m^2, 1 pound per square foot = 0.0479 kPa.

a. Interpolation permitted, extrapolation not permitted.
b. Reserved.
c. Footing dimensions shall allow complete bearing of the post.
d. If the support is a brick or CMU pier, the footing shall have a minimum 2-inch projection on all sides.
e. Area, in square feet, of deck surface supported by post and footings.
f. Minimum thickness shall only apply to plain concrete footings,

R507.5 Deck beams. Maximum allowable spans for wood deck beams, as shown in Figure R507.5, shall be in accordance with Table R507.5(1) through R507(3). Beam plies shall be fastened with two rows of 10d (3-inch × 0.128-inch) nails minimum at 16 inches (406 mm) on center along each edge. Beams shall be permitted to cantilever at each end up to one-fourth of the allowable beam span. Deck beams of other materials shall be permitted where designed in accordance with accepted engineering practices.

TABLE R507.5 is not adopted. See TABLES R507.5(1), R507.5(2) and R507.5(3)

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

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

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

Exception: Decks not more than 30 inches above grade at any point may be unattached

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TABLE R507.6
MAXIMUM DECK JOIST SPANS

Load[a] (psf)	Joist Species[b]	Joist Size	Allowable Joist Span[b,c] (feet-inches)			Maximum Cantilever[f,g] (feet-inches)							
			Joist Spacing (inches)			Adjacent Joist Back Span[g] (feet)							
			12	16	24	4	6	8	10	12	14	16	18
60 Live Load or 70 Ground Snow Load	Douglas fir-larch[e], Hem-fir[e], Spruce-pine-fir[e]	2×6	7-11	7-1	5-9	1-0	1-6	NP	NP	NP	NP	NP	NP
		2×8	10-5	9-5	7-8	1-0	1-6	2-0	2-1	NP	NP	NP	NP
		2×10	13-3	11-6	9-5	1-0	1-6	2-0	2-6	2-8	NP	NP	NP
		2×12	15-5	13-4	10-11	1-0	1-6	2-0	2-6	3-0	3-3	NP	NP
	Redwood[f], Western Cedars[f], Ponderosa Pine[f], Red Pine[f]	2×6	7-4	6-8	5-10	1-0	1-4	NP	NP	NP	NP	NP	NP
		2×8	9-8	8-10	7-4	1-0	1-6	1-11	NP	NP	NP	NP	NP
		2×10	12-4	11-0	9-0	1-0	1-6	2-0	2-6	2-6	NP	NP	NP
		2×12	14-9	12-9	10-5	1-0	1-6	2-0	2-6	3-0	3-0	NP	NP

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

a. Dead load = 10 psf dead load. Snow load not assumed to be concurrent with live load.
b. No. 2 grade, wet service factor included.
c. L/Δ = 360 at main span.
d. L/Δ = 180 at cantilever with 220-pound point load applied to end.
e. Includes incising factor.
f. Incising factor not included.
g. Interpolation permitted. Extrapolation not permitted.

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R1004.1.1 Emission standards for factory-built fireplaces. No new or used factory-built fireplace shall be installed in Washington State unless it is certified and labeled in accordance with procedures and criteria specified in ASTM E2558, Standard Test Method for Determining Particulate Matter Emission from Fires in Wood Burning Fireplaces.

To certify an entire fireplace model line, the internal assembly shall be tested to determine its particulate matter emission performance. Retesting and recertifying is required if the design and construction specifications of the fireplace model line internal assembly change. Testing for certification shall be performed by a Washington State Department of Ecology (DOE) approved and U. S. Environmental Protection Agency (EPA) accredited laboratory.

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

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APPENDIX T
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

SECTION AT101
SCOPE

AT101.1 General. These provisions shall be applicable for new construction where solar-ready provisions are required.

SECTION AT102
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 or solar water-heating system.

SECTION AU103
SOLAR READY ZONE

AT103.1 General. New detached one- and two-family dwellings, and multiple single-family dwellings (townhouses) with not less than 600 square feet (55.74 m2) of roof area oriented between 90 degrees and 270 degrees of true north shall comply with Sections AT103.2 through AT103.10.

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 AT103 are in full or partial shade for more than 70 percent of daylight hours annually.

AT103.2 Construction document requirements for solar ready zone. Construction documents shall indicate the solar ready zone.

AT103.3 Solar-ready zone area. The total solar-ready zone area shall be not less than 300 square feet (27.87 m^2) 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 m^2) per dwelling shall have a solar-ready zone area of not less than 150 square feet (13.94 m^2). The solar-ready zone shall be composed of areas not less than 5 feet (1.52 m) in width and not less than 80 square feet (7.44 m^2) exclusive of access or set back areas as required in this code or the applicable provisions of the *International Fire Code*. No portion of the solar zone shall be located on a roof slope greater than 2:12 that faces within 45 degrees of true north.

AT103.4 Obstructions. Solar-ready zones shall be free from obstructions including, but not limited to, vents, chimneys, and roof-mounted equipment.

AT103.5 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.

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

AT103.7 Roof load documentation. The structural design loads for roof dead load and roof live load shall be clearly indicated on the construction documents.

AT103.8 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.

AT103.9 Electrical 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.

AT103.10 Construction documentation certificate. A permanent certificate, indicating 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.

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APPENDIX U
DWELLING UNIT FIRE SPRINKLER SYSTEMS

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

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

Exceptions:

1. Uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require sprinklers. In uninhabitable attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment, a sprinkler shall be installed above the equipment; however, sprinklers shall not be required in the remainder of the space.
2. Clothes closets, linen closets and pantries not exceeding 24 square feet (2.2 m2) 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.

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APPENDIX V
FIRE SPRINKLERS

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

AV107.1 Fire sprinklers. An approved automatic fire sprinkler system shall be installed in new one-family and two-family dwellings and townhouses in accordance with Appendix U.

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