

2024 International Residential Code comparison to 2018 edition

Code Section	Description	Existing Code Language	New Code Language
R102.7.1 to R102.6.1	Additions, Alteration or Repairs	Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. Additions, alterations, repairs and relocations shall not cause an existing structure to become unsafe or adversely affect the performance of the building.	Additions, alterations or repairs to any structure shall conform to the requirements for a new structure without requiring the existing structure to comply with the requirements of this code, unless otherwise stated. Additions, alterations, repairs and relocations shall not cause an existing structure to become unsafe or adversely affect the performance of the building. Where additions, alteration or changes of use to an existing structure result in a use, occupancy, height or means or egress outside the scope of this code, the building shall comply with the international Existing Building code.
R104.2	Determination of compliance	The building official is hereby authorized and directed to enforce the provisions of this code. The building official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of its provisions. Such interpretations, policies and procedures shall be in compliance with the intent and purpose of this code. Such policies and procedures shall not have the effect of waiving requirements specifically provided for in this code.	The building official shall have the authority to render interpretations of this code and to adopt policies and procedures in order to clarify the application of this code's provisions. Such interpretations, policies and procedures: 1. Shall be in compliance with the intent and purpose of this code. 2. Shall not have the effect of waiving requirements specifically provided for in this code.
R104.4.1.	Warrant	This Code Section is not referenced in the current 2018 International Residential Codes	Where the building code official has first obtained a proper inspection warrant or other remedy provided by law to secure entry, an owner, the owner's authorized agent, occupant or person having charge, care or control of the structure or premises shall not fail or neglect, after a proper request is made as herein provided, to permit entry therein by the building code official for the purposes of inspection and examination pursuant to this code.
R104.7.2	Inspections	The building official shall make the required inspections, or the building official shall have the authority to accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The building official is authorized to engage such expert opinion as deemed necessary to report on unusual technical issues that arise, subject to the approval of the appointing authority.	The code official shall have the authority to conduct inspections, or shall accept reports of inspection by approved agencies or individuals. Reports of such inspections shall be in writing and be certified by a responsible officer of such approved agency or by the responsible individual. The building official shall keep a record of each inspection made, including notices and orders issued, showing the findings and disposition of each.

R105.2	Work Exempt From Permit	R105.2 Work Exempt From Permit Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following: 1. One-story detached accessory structures, provided that the floor area does not exceed 200 square feet (18.58 m ²).	This Section Amended. Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following: 1. One-story detached accessory structures, provided that the floor area does not exceed 200 square feet (11.15 m ²) and the wall plate height measured at the highest point does not exceed 8 feet (2134 mm), and no; Mechanical, Electrical, or Plumbing components.
R105.2	Work Exempt From Permit	Exemption from permit requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this jurisdiction. Permits shall not be required for the following: Building: One-story detached accessory structures, provided that the floor area does not exceed 200 square feet (18.58 m ²). Fences not over 7 feet (2134 mm) high. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge. Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons (18 927 L) and the ratio of height to diameter or width does not exceed 2 to 1. Sidewalks and driveways. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work. Prefabricated swimming pools that are less than 24 inches (610 mm) deep. Swings and other playground equipment. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support. Decks not exceeding 200 square feet (18.58 m ²) in area, that are not more than 30 inches (762 mm) above grade at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.	This Section Amended. Add new Section. 11. Amend Section R105.2. by adding item #11. Replacement of a roof cover where the replacement roof covering classification is equal to or greater than the existing roof covering classification and does not increase the loads upon the structural frame.
R105.5	Expiration (permit)	Every permit issued shall become invalid unless the work authorized by such permit is commenced within 180 days after its issuance or after commencement of work if more than 180 days pass between inspections. The building official is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.	This Section Amended. R105.5.1 Reinstatement. The Building Official is authorized to reinstate a permit that has expired upon payment of a reinstatement fee provided: 1. The permit has not been expired for more than 180 days and, 2. Code requirements that would affect the project have not changed.

R106.1	Submittal Documents	Submittal documents consisting of construction documents, and other data shall be submitted in two or more sets with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Where special conditions exist, the building official is authorized to require additional construction documents to be prepared by a registered design professional.	This Section Amended. Submittal documents consisting of construction documents, and other data shall be submitted in two or more sets, or in a digital format where allowed by the building official, with each application for a permit. The construction documents shall be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed. Arizona Registered Design Professional required at the end of the section
R108.2.	Schedule of Permit Fees	On buildings, structures, electrical, gas, mechanical and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the schedule as established by the applicable governing authority.	This Section Amended. R108.2 Schedule of permit fees by replacing with the following text: Building permit fees shall be assessed in accordance with the City of Maricopa Development Services Fee Schedule as approved by City Council. For electrical, gas, mechanical, and plumbing systems or alterations requiring a permit, a fee for each permit shall be paid as required, in accordance with the City of Maricopa Development Services and Fee Schedule as approved by City Council.
R109.1.5.	Inspections	This Code Section is not referenced in the current 2018 International Residential Codes	This Section Amended. New Section # 7. Amend Section R109.1.5. By adding New Section R109.1.5.2. Lath or gypsum board inspection. Inspection of the lath or gypsum board shall be made after all lathing and 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.
R111	Connection of Service Utilities	R111.1 Connection of Service Utilities A person shall not make connections from a utility, source of energy, fuel or power to any building or system that is regulated by this code for which a permit is required, until approved by the building official.	This Section Amended. Amend Section R111 Service Utilities by adding a new subsection as follows: R111.4 Utility Company Agreement. Inspection of service equipment and related apparatus will be required prior to re-connection of electric power or gas service for all buildings that have been vacant more than six months.

R301.2	Climate and Geographic Design Criteria	<p>The effective wind area shall be equal to the span length multiplied by an effective width. This width shall be permitted to be not less than one-third the span length. For cladding fasteners, the effective wind area shall not be greater than the area that is tributary to an individual fastener.</p> <p>For effective areas between those given, the load shall be interpolated or the load associated with the lower effective area shall be used.</p> <p>Table values shall be adjusted for height and exposure by multiplying by the adjustment coefficient in Table R301.2(3).</p> <p>See Figure R301.2(8) for location of zones.</p> <p>Plus and minus signs signify pressures acting toward and away from the building surfaces.</p>	<p>Values are 3-second gust wind speeds in miles per hour (m/s) at 33 feet (10 m) above ground for Exposure Category C.</p> <p>Linear interpolation is permitted between contours. Point values are provided to aid with interpolation.</p> <p>Islands, coastal areas and land boundaries outside the last contour shall use the last wind speed contour.</p> <p>Location-specific basic wind speeds shall be permitted to be determined using the ASCE Wind Design Geodatabase.</p> <p>Wind speeds for Hawaii, US Virgin Islands and Puerto Rico shall be determined from the ASCE Wind Design Geodatabase.</p> <p>Mountainous terrain, gorges, ocean promontories and special wind regions shall be examined for unusual wind conditions. Site specific values for selected special wind regions shall be permitted to be determined using the ASCE Wind Design Geodatabase.</p> <p>Wind speeds correspond to approximately a 7-percent probability of exceedance in 50 years (Annual Exceedance Probability = 0.00143, MRI = 700 years).</p> <p>The ASCE Wind Design Geodatabase can be accessed at the ASCE 7 Hazard Tool (https://asce7hazardtool.online) or approved equivalent.</p>

Numerous R Code Section references where reassigned to new R code sections throughout chapter 3 of the 2024 residential code

R111.4.	Climatic and Geographic Design Criteria	<p>Table R301.2 Climatic and Geographic Design Criteria</p> <p>Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2(1).</p>	<p>This Section Amended</p> <p>Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local jurisdiction and set forth in Table R301.2</p> <p>Ground Snow Load - None</p> <p>Wind Speed - 105 mph</p> <p>Seismic Category - B</p> <p>Weathering - Moderate</p> <p>Frost line depth - 12"</p> <p>Termite - Moderate to Heavy</p> <p>Winter Design Temperature – 32 degrees F</p> <p>Ice Barrier Underlayment Required – No</p> <p>Flood Hazards – Per City of Maricopa Flood Administrator</p> <p>Air Freezing Index – 0</p> <p>Mean Annual Temperature – 72.9</p> <p>10. Amend Table R302.1(1):</p> <p>Projections - Non Fire Resistant Rated – Minimum Fire Separation Distance Change 5 Feet to 4 Feet.</p>

R301.2.2.10.1	<u>Seismic Restraint Resistance</u>	This Code Section is not referenced in the current 2018 International Residential Codes	Supports, bracing and anchorage of appliances and equipment in Seismic Design Categories D0, D1 and D2, and in townhouses in Seismic Design Category C, shall resist a horizontal force equal to one-third times the operating weight of the component, acting in any direction. Bracing shall comply with the following: Components supported at the base shall be braced with strapping at points within the upper one-third of the component's vertical dimensions, or the component anchorage shall be designed to resist overturning. Components suspended from the structure shall be braced to the structure using either flexible or rigid bracing. Flexible bracing such as wires or straps shall be provided in each of the four orthogonal directions. Rigid bracing such as struts or bars may be provided in two orthogonal directions.
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).	Construction, projections, openings and penetrations of exterior walls of dwellings, townhouses and accessory buildings shall comply with Table R302.1(1) based on fire separation distance ; or dwellings and townhouses equipped throughout with an automatic sprinkler system installed in accordance with Section P2904 shall comply with Table R302.1(2) based on fire separation distance. For the purposes of determining fire separation distance, dwellings and townhouses on the same lot shall be assumed to have an imaginary line between them. Where a new dwelling or townhouse is to be erected on the same lot as an existing dwelling or townhouse, the location of the assumed imaginary line with relation to the existing dwelling or townhouse shall be such that the existing dwelling or townhouse meets requirements of this section. Where a lot line exists between adjacent townhouse units, fire separation distance of exterior walls shall be measured to the lot line. Where a lot line does not exist between adjacent townhouse units, an imaginary line shall be assumed between the adjacent townhouse units and fire separation distance of exterior walls shall be measured to the imaginary line. Fire separation distance and requirements of Section R302.1 shall not apply to walls separating townhouse units that are required by Section R302.2.

R305.2.	Protection against Subterranean Termites	R318.1 Subterranean Termite Control Methods In areas subject to damage from termites as indicated by Table R301.2(1), protection shall be by one, or a combination, of the following methods:	<p>This Section Amended.</p> <p>Amend Section R305.2. Protection against Subterranean Termites – Chemical termite treatment by adding new paragraphs after the last sentence as follows:</p> <p>Within the perimeter of the foundation of any building which requires a building permit, the base course of all fill which is used to support a concrete slab shall be treated against termite infestation. The soil treatment shall be applied by a duly licensed applicator in accordance with the rules and regulations of the Arizona Structural Pest Control Commission.</p> <p>Termite retardant chemicals shall be applied prior to placing the concrete. If the soil has been treated and the fill is disturbed prior to pouring the slab, or if the concrete, is not poured within the time limit specified for the chemical used, the soil must be retreated according to the same standards. If a concrete slab has been poured prior to pre-treatment, the site must be treated in accordance with the rules and regulations references herein above.</p> <p>EXCEPTION: Buildings accessory to Group R, and buildings with floors and walls built of metal, masonry, concrete or other non-wood product. Certification of such soil treatment shall be furnished to the Building Official when requested and shall include the name of the applicator, state license number, chemical used, time and location of application and length of warranty.</p>
R307.2	Storm Shelter Construction	This Code Section is not referenced in the current 2018 International Residential Codes	Storm shelters shall be constructed in accordance with this code and ICC 500.
R309.2.	One and Two Family Dwellings Automatic Sprinkler Systems	An automatic sprinkler system shall be installed in one- and two-family dwellings. Exception: An automatic sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with a sprinkler system	<p>This Section Amended.</p> <p>R309.2. Delete in its entirety, refer to A.R.S. § 9-807</p>
R313.1.2.	R313.1.2 Habitable Attics and Basements in Existing Buildings	This Code Section is not referenced in the current 2018 International Residential Codes	R313.1.2 Habitable Attics and Basements in Existing Buildings Where a habitable attic or habitable space in a basement is created in an existing building, ceiling height shall not be less than 6 feet 8 inches (2032 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 4 inches (1930 mm). Exceptions: For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). At beams, girders, ducts or other obstructions, the ceiling height shall be not less than 6 feet 4 inches (1930 mm) from the finished floor.

R315.2	Sleeping Lofts	This Code Section is not referenced in the current 2018 International Residential Codes	Where provided in dwelling units or sleeping units, sleeping lofts shall comply with this code as modified by Sections R315.2 through R315.5. Sleeping lofts constructed in compliance with this section shall be considered a portion of the story below. Such sleeping lofts shall not contribute to the number of stories as regulated by this code. Exceptions: Sleeping lofts need not comply with Section R315 where they meet any of the following conditions: The sleeping loft has a depth of less than 3 feet (914 mm). The sleeping loft has a floor area of less than 35 square feet (3.3 m ²). The sleeping loft is not provided with a permanent means of egress.
R317.6 , R317.7 and R317.7.1	Electric Vehicle Charging Systems, Automatic lifts and installations	This Code Section is not referenced in the current 2018 International Residential Codes	R317.6 Electric Vehicle Charging Systems Where provided, electric vehicle charging systems shall be installed in accordance with NFPA 70. Electric vehicle charging system equipment shall be listed and labeled in accordance with UL 2202. Electric vehicle supply equipment shall be listed and labeled in accordance with UL 2594. R317.7 Automotive Lifts Where provided, automotive lifts shall be listed and labeled in accordance with ANSI/ALI ALCTV. R317.7.1 Installation Automotive lifts shall be installed in accordance with ANSI/ALI ALCTV, the listing and the lift manufacturer's installation instructions. Automotive lifts shall not be installed within the habitable space of a dwelling unit.

R318.7	Landing for Stairways	<p>R311.7.6 Landings for Stairways</p> <p>There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).</p> <p>Exception: A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided that a door does not swing over the stairs.</p>	<p>There shall be a floor or landing at the top and bottom of each flight of stairs. The width perpendicular to the direction of travel shall be not less than the width of the flight served. For landings of shapes other than square or rectangular, the depth at the walk line and the total area shall be not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).</p> <p>Exceptions:</p> <p>The top landing of an interior stairway, including those in an enclosed garage, shall be permitted to be on the other side of a door located at the top of the stairway, provided that the door does not swing over the stairs. At an enclosed garage, the top landing at the stair shall be permitted to be not more than 7 3/4 inches (197 mm) below the top of the threshold. At exterior doors, a top landing is not required for an exterior stairway of not more than two risers, provided that the door does not swing over the stairway.</p> <p>Exterior stairways to grade with three or fewer risers serving a deck, porch or patio shall have a bottom landing width of not less than 36 inches (914 mm), provided that the stairway is not the required access to grade serving the required egress door.</p>
R319.5.1	Window Opening Control Device	<p>R312.2.2</p> <p>Window opening control devices shall comply with ASTM F2090. The window opening control device, after operation to release the control device allowing the window to fully open, shall not reduce the net clear opening area of the window unit to less than the area required by Section R310.2.1.</p>	<p>R319.5.1 Window Opening Control Device and Fall Protection Device Height</p> <p>Window opening control devices or fall protection devices shall be located at a height in accordance with Section R319.1.1 or at as low a height as the device can be installed within the existing clear opening.</p>
R322.3.	Care Facilities	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>Where care facilities are permitted to be constructed in accordance with Section R101.2, the portions of the dwelling used to operate a business providing care shall be accessible in accordance with Chapter 11 of the International Building Code.</p>

R325.1.1	Natural Light	<p>R303.1 Habitable Rooms</p> <p>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.</p> <p>Exceptions:</p> <p>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 M1505.</p> <p>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.</p> <p>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.</p>	<p>R325.1.1 Natural Light</p> <p>Habitable rooms shall have an aggregate area of glazed openings not less than 8 percent of the floor area of such rooms. Required glazed openings shall face directly onto a street, alley or public way, or a yard or court located on the same lot as the building.</p> <p>Exceptions:</p> <p>Required glazed openings shall be permitted to face into a roofed porch, deck or patio adjacent to a street, alley, public way, yard or court, where the longer side of the roofed area is not less than 65 percent unobstructed and the ceiling height is not less than 7 feet (2134 mm).</p> <p>Required glazed openings shall be permitted to face into a sunroom adjacent to a street, alley, public way, yard or court.</p> <p>Glazed openings are not required where 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.</p> <p>Eave projections shall not be considered as obstructing the clear open space of a yard or court.</p>
R325.1.2.	Natural Ventilation		<p>Habitable rooms shall have an aggregate area openable to the outdoors not less than 4 percent of the floor area of such rooms. Openings 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.</p> <p>Exceptions:</p> <p>Natural ventilation shall not be required in habitable rooms other than kitchens where a whole-house mechanical ventilation system or a mechanical ventilation system capable of producing 0.35 air changes per hour in the habitable rooms is installed in accordance with Section M1505.</p> <p>Natural ventilation shall not be required in kitchens where a local exhaust system is installed in accordance with Section M1505.</p> <p>Required ventilation openings shall be permitted to open into a thermally isolated sunroom or roofed porch, deck, or patio where not less than 40 percent of the roofed area perimeter is open to the outdoor air.</p> <p>Required ventilation openings shall be permitted to open into a thermally isolated sunroom provided there is an openable area between the adjoining room and the sunroom of not less than one-tenth of the floor area of the interior room and not less than 20 square feet (1.9 m²). The minimum openable area of the sunroom to outdoor air shall be based on the total floor area of the adjoining room and the sunroom.</p>

R325.8.	Required Heating.	R303.10 Required Heating Where 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 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 at the design temperature. The installation of one or more portable space heaters shall not be used to achieve compliance with this section.	This Section Amended. Section R325.8 Required heating, by revising the title to read "Required Heating and Cooling" and by adding the following sentence to the end of the paragraph: Every dwelling unit and guest room shall be provided with cooling facilities capable of maintaining a room temperature of not more than 80 degrees F at a point 3 feet above the floor in all habitable rooms under the average local climate conditions.	Amend
R329.6.4	Building-Integrated Photovoltaic (BIPV) Systems	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 this section.	Where building-integrated photovoltaic (BIPV) systems are installed in a manner creating areas with electrical hazards that are hidden from view, markings shall be provided to identify the hazardous areas to avoid for ladder placement. The markings shall be reflective and be visible from grade beneath the eaves or other location approved by the fire code official. Exception: BIPV systems listed in accordance with UL 3741, where the removal or cutting away of portions of the BIPV system during firefighting operations have been determined to not expose a firefighter to electrical shock hazards.	
R330.4	Energy Storage System Locations	This Code Section is not referenced in the current 2018 International Residential Codes	ESS shall be installed only in the following locations: Detached garages and detached accessory structures. Attached garages separated from the dwelling unit living space in accordance with Section R302.6. Outdoors or on the exterior side of exterior walls located not less than 3 feet (914 mm) from doors and windows directly entering the dwelling unit, except where smaller separation distances are permitted by the UL 9540 listing and manufacturer's installation instructions. Enclosed utility closets, basements, storage or utility spaces within dwelling units with finished or noncombustible walls and ceilings. Walls and ceilings of unfinished wood-framed construction shall be provided with not less than 5/8-inch (15.9 mm) Type X gypsum wallboard. Openings into the dwelling shall be equipped with solid wood doors not less than 13/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 13/8 inches (35 mm) in thickness, or doors with a 20-minute fire protection rating. Doors shall be self-latching and equipped with a self-closing or an automatic-closing device. Penetrations through the required gypsum wallboard into the dwelling shall be protected as required by Section R302.11, Item 4. ESS shall not be installed in sleeping rooms, or closets or spaces opening directly into sleeping rooms.	

R330.8 & R330.8.1	Protection From Impact	<p>R327.6 Protection From Impact Stationary storage battery systems installed in a location subject to vehicle damage shall be protected by approved barriers.</p>	<p>ESS installed in a location subject to vehicle damage shall be protected in accordance with Section R330.8.1 or R330.8.2.</p> <p>R330.8.1 Garages Where an ESS is installed in the normal driving path of vehicle travel within a garage, impact protection complying with Section R330.8.3 shall be provided. The normal driving path is a space between the garage vehicle opening and the interior face of the back wall to a height of 48 inches (1219 mm) above the finished floor. The width of the normal driving path shall be equal to the width of the garage door opening. Impact protection shall also be provided for an ESS installed at either of the following locations (see Figure R330.8.1): On the interior face of the back wall and located within 36 inches (914 mm) to the left or to the right of the normal driving path. On the interior face of a side wall and located within 24 inches (610 mm) from the back wall and 36 inches (914 mm) of the normal driving path. Exception: Where the clear height of the vehicle garage opening is 7 feet 6 inches (2286 mm) or less, ESS installed not less than 36 inches (914 mm) above finished floor are not subject to vehicle impact protection requirements.</p>

R330.8.3	Impact Protection Option	This Code Section is not referenced in the current 2018 International Residential Codes	<p>ESS protection shall comply with one of the following:</p> <p>Bollards constructed in accordance with one of the following:</p> <p>Minimum 48 inches (1219 mm) in length by 3 inches (76 mm) in diameter Schedule 80 steel pipe embedded in a concrete pier not less than 12 inches (305 mm) deep and 6 inches (152 mm) in diameter, with not less than 36 inches (914 mm) of pipe exposed, filled with concrete and spaced at a maximum interval of 5 feet (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from an ESS.</p> <p>Minimum 36 inches (914 mm) in height by 3 inches (76 mm) in diameter Schedule 80 steel pipe fully welded to a steel plate not less than 8 inches (203 mm) in length by 1/4 inch (6.4 mm) in thickness and bolted to a concrete floor by means of 4 1/2-inch (114 mm) concrete anchors imbedded not less than 3 inches (76 mm). Spacing shall be not greater than 60 inches (1524 mm), and each bollard shall be located not less than 6 inches (152 mm) from the ESS.</p> <p>Premanufactured steel pipe bollards filled with concrete and anchored in accordance with the manufacturer's installation instructions, with spacing not greater than 60 inches (1524 mm). Each bollard shall be located not less than 6 inches (152 mm) from the ESS.</p> <p>Wheel barriers constructed in accordance with one of the following:</p> <p>Concrete or polymer 4 inches (102 mm) in height by 5 inches (127 mm) in width by 70 inches (1778 mm) in length, anchored to the concrete floor not less than every 36 inches (914 mm) and located not less than 54 inches (1372 mm) from the ESS. Concrete anchors not less than 3 1/2 inches (89 mm) in diameter with 3-inch (76 mm) embedment per barrier shall be used. Spacing between barriers shall be not greater than 36 inches (914 mm).</p> <p>Premanufactured wheel barriers shall be anchored in accordance with the manufacturer's installation instructions. An approved method designed to resist an impact of 2,000 pounds per square foot (95 760 N/m²) in the direction of travel at 24 inches (610 mm) above grade.</p>
	Soil Test	Where quantifiable data created by accepted soil science methodologies indicate expansive soils, compressible soils, shifting soils or other questionable soil characteristics are likely to be present, the building official shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be done by an approved agency using an approved method.	Where quantifiable data created by accepted soil science methodologies indicate expansive soils, compressible soils, shifting soils or other questionable soil characteristics are likely to be present, the building official shall determine whether to require a soil test to determine the soil's characteristics at a particular location. This test shall be done by an approved agency using an approved method. Where the seismic design category in accordance with Section R301.2.2.1 is C or greater and where soil testing is performed, the geotechnical report shall include the determination of the site class and the short-period spectral response acceleration, SDS, in accordance with Section 1613 of the International Building Code. The seismic design category shall be assigned in accordance with Table R301.2.2.1.1.

R403.5	Crushed Stone Footing	Clean crushed stone shall be free from organic, clayey or silty soils. Crushed stone shall be angular in nature and meet ASTM C33, with the maximum size stone not to exceed 1/2 inch (12.7 mm) and the minimum stone size not to be smaller than 1/16 inch (1.6 mm). Crushed stone footings for precast foundations shall be installed in accordance with Figure R403.4(1) and Table R403.4. Crushed stone footings shall be consolidated using a vibratory plate in not greater than 8-inch (203 mm) lifts. Crushed stone footings shall be limited to Seismic Design Categories A, B and C.	R403.5 Crushed Stone Footings for Cast-in-Place Concrete Foundations Crushed stone footings in accordance with Section R403.4.1 shall be permitted for nonretaining cast-in-place concrete foundations complying with Section R404.1.3 and this section. The footing and foundation wall shall be installed in accordance with Figure R403.5(1), or Figure R403.5(2) and Table R403.5, or Figure R403.5(3). Crushed stone footings for cast-in-place concrete foundations shall be permitted for townhouses in Seismic Design Categories A and B and one- and two-family dwellings in Seismic Design Categories A, B and C.
R502.11	Floor Framing Supporting Guards	This Code Section is not referenced in the current 2018 International Residential Codes	The framing at the open edge of a floor supporting a required guard assembly shall be constructed in accordance with Section R502.11.1 or R502.11.2 for guard assemblies not exceeding 44 inches (1118 mm) in height, or shall be designed in accordance with accepted engineering practice to support the guard assembly. Where trusses and I-joists are used as edge framing members supporting guards, the effects of the guard loads shall be specifically considered in the design of the edge member.
R502.11.1	Conventional Edge Framing	This Code Section is not referenced in the current 2018 International Residential Codes	R502.11.1 Conventional Edge Framing Where a roll brace is aligned with each guard post, the framing at the edge of the floor shall consist of a solid or built-up member of lumber, structural glued-laminated timber or structural composite lumber having a net width of not less than 3 inches (76 mm) and a net depth of not less than 9 1/4 inches (235 mm), and shall be braced to resist rotation by roll bracing as described in Section R502.11.3.
R502.11.2	Timber Edge Framing	This Code Section is not referenced in the current 2018 International Residential Codes	R502.11.2 Timber Edge Framing Where a roll brace is not aligned with each guard post, the framing at the edge of the floor shall consist of sawn timber not less than 6 inches by 10 inches or structural glued-laminated timber not less than 5 1/8 inches by 9 1/4 inches (130 mm x 235 mm) and shall be braced to resist rotation by roll bracing as described in Section R502.11.3 at intervals of 48 inches (1219 mm) or less.
R502.11.3	Roll Bracing	This Code Section is not referenced in the current 2018 International Residential Codes	R502.11.3 Roll Bracing Each roll brace shall be a joist or blocking matching the depth of the edge member and extending perpendicular to the edge member not less than 16 inches (406 mm) from the edge. Blocking shall have end connections with not fewer than six 16d common nails. Floor sheathing shall be continuous for not less than 24 inches (610 mm) from the edge and shall be fastened to each roll brace with not fewer than 12 (twelve) 10d common nails and shall be fastened to the edge member with a minimum of 12 (twelve) 10d common nails within 12 inches (305 mm) of the roll brace.

R506.2	Post Tensioned Slab on Ground	This Code Section is not referenced in the current 2018 International Residential Codes	Post-tensioned concrete slab-on-ground floors placed on expansive or stable soils shall be designed in accordance with PTI DC10.5.
507.2.1.	Wood Material (wood decks)	Wood materials shall be No. 2 grade or better lumber, preservative-treated in accordance with Section R317, or approved, naturally durable lumber, and termite protected where required in accordance with Section R318. Where design in accordance with Section R301 is provided, wood structural members shall be designed using the wet service factor defined in AWC NDS. Cuts, notches and drilled holes of preservative-treated wood members shall be treated in accordance with Section R317.1.1. All preservative-treated wood products in contact with the ground shall be labeled for such usage.	Wood structural members shall be protected from decay where required by Sections R304.1 and R304.1.2, and protected from termites where required by Section R305.1. Where design in accordance with Section R301 is provided, wood structural members shall be designed using the wet service factor defined in ANSI AWC NDS. Sawn lumber for joists, beams and posts shall be No. 2 or better. Cuts, notches and drilled holes of preservative-treated wood members shall be treated in accordance with Section R304.1.1.
R507.2.3	Fasteners and Connectors	Metal fasteners and connectors used for all decks shall be in accordance with Section R317.3 and Table R507.2.3.	Metal fasteners and connectors used for all decks shall be in accordance with Section R304.3 and Table R507.2.3. Holes for through bolts shall be drilled to a diameter of 1/32 inch to 1/16 inch larger than the bolt diameter. Connectors shall be installed in accordance with the manufacturer's approved instructions.
R507.5.1.	Deck Beam Bearing	The ends of beams shall have not less than 1 1/2 inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) of bearing on concrete or masonry for the entire width of the beam. Where multiple-span beams bear on intermediate posts, each ply must have full bearing on the post in accordance with Figures R507.5.1(1) and R507.5.1(2).	Beams and individual beam plies of built-up beams shall be continuous between bearing locations and continuous across bearing locations supporting beam cantilevers. Beams shall be permitted to cantilever beyond bearing locations up to one-fourth of the actual beam span. The ends of beams shall have not less than 1 1/2 inches (38 mm) of bearing length on wood or metal and not less than 3 inches (76 mm) of bearing length on concrete or masonry for the entire width of the beam.
R507.9.3	Ledger to Band Joist Details	Fasteners used in deck ledger connections in accordance with Table R507.9.1.3(1) shall be hot-dipped galvanized or stainless steel and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2).	Where ledgers are fastened in accordance with Table R507.9.1.3(1), fasteners shall comply with Section R507.2.3 and shall be installed in accordance with Table R507.9.1.3(2) and Figures R507.9.1.3(1) and R507.9.1.3(2). Holes for 1/2-inch (12.7 mm) lag screws shall be predrilled with two drill bits so that a hole 1/2 inch (12.7mm) in diameter is drilled through the ledger and sheathing, if present, and a hole 5/16 inch (7.9 mm) to 3/8 inch (9.5mm) in diameter is drilled through the band joist.

R507.9.1	Ledger Flashing	This Code Section is not referenced in the current 2018 International Residential Codes	Where ledgers are attached to wood-frame construction, flashing shall be installed above the ledger to prevent the entry of water into the wall cavity or behind the ledger. Flashing shall extend vertically not less than 2 inches (51 mm) above the ledger. Flashing shall extend horizontally not less than 4 inches (102 mm) beyond the ledger face or shall extend to the ledger face and not less than 1/4 inch down the ledger face. Exceptions: Where a window or door opening is located less than 2 inches (51 mm) above the ledger, flashing shall extend to the bottom of the wall opening. Flashing is not required where the ledger is spaced horizontally from the exterior wall covering not less than 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.
R507.9.1.6	Water Resistive Barrier (ledger)	This Code Section is not referenced in the current 2018 International Residential Codes	The water-resistive barrier required by Section R703.2 shall be lapped over a vertical leg of the ledger flashing or counterflashing extending up the wall by not less than 2 inches (51 mm) or the height of the vertical flashing leg, whichever is less. The water-resistive barrier shall continue from the top of the ledger flashing down the wall and behind the ledger flashing and ledger. Exceptions: Flashing shall be permitted to be placed against the face of the water-resistive barrier where a self-adhering membrane counterflashing is installed not less than 2 inches (51 mm) over the vertical leg of the flashing and not less than 2 inches (51 mm) onto the water-resistive barrier. Flashing shall be permitted to be placed in front of the water-resistive barrier and behind the exterior wall covering where ledgers are spaced horizontally from the exterior wall not less than 1/4 inch (6.4 mm) to allow for drainage and ventilation behind the ledger.
R507.9.1.8	Exterior Wall Coverings	This Code Section is not referenced in the current 2018 International Residential Codes	Exterior wall coverings shall be terminated above the finished deck surface in accordance with the covering manufacturer's requirements and Chapter 7, as applicable to the type of covering. Exception: Exterior wall coverings shall be permitted behind ledgers in accordance with Section R507.9.1.5 where capable of resisting compression forces from the ledger attachment.
R602.10.3.1.	Wall Height for Wood Framing	This Code Section is not referenced in the current 2018 International Residential Codes	For determination of braced wall and panel adjustment factors in accordance with Section R602.10, wall height shall be the vertical distance from the lower edge of the bottom plate to the upper edge of the upper top plate determined in accordance with Figure R602.10.3.1.

R703.2	Water-Resistive Barrier	<p>One layer of No. 15 asphalt felt, free from holes and breaks, complying with ASTM D226 for Type 1 felt or other approved water-resistive barrier shall be applied over studs or sheathing of all exterior walls. No.15 asphalt felt shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm). Where joints occur, felt shall be lapped not less than 6 inches (152 mm). Other approved materials shall be installed in accordance with the water-resistive barrier manufacturer's installation instructions. The No. 15 asphalt felt or other approved water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1.</p>	<p>Not fewer than one layer of water-resistive barrier shall be applied over studs or sheathing of all exterior walls with flashing as indicated in Section R703.4, in such a manner as to provide a continuous water-resistive barrier behind the exterior wall veneer and behind deck ledgers. The water-resistive barrier material shall be continuous to the top of walls and terminated at penetrations and building appendages in a manner to meet the requirements of the exterior wall envelope as described in Section R703.1. Where the water-resistive barrier also functions as a component of a continuous air barrier, the water-resistive barrier shall be installed as an air barrier in accordance with Section N1102.5.1.1. Water-resistive barrier materials shall comply with one of the following:</p> <p>No. 15 felt complying with ASTM D226, Type 1.</p> <p>ASTM E2556, Type 1 or 2.</p> <p>Foam plastic insulating sheathing water-resistive barrier systems complying with Section R703.1.1 and installed in accordance with the manufacturer's installation instructions.</p> <p>ASTM E331 in accordance with Section R703.1.1.</p> <p>Other approved materials in accordance with the manufacturer's installation instructions.</p> <p>No.15 asphalt felt and water-resistive barriers complying with ASTM E2556 shall be applied horizontally, with the upper layer lapped over the lower layer not less than 2 inches (51 mm), and where joints occur, shall be lapped not less than 6 inches (152 mm).</p> <p>Exception: A water-resistive barrier shall not be required in unconditioned detached tool sheds, storage sheds, playhouses, and other similar accessory structures provided all of the following requirements are met:</p> <p>Exterior wall covering is limited to siding that is attached direct to studs.</p> <p>Exterior walls are uninsulated.</p> <p>Interior side of exterior walls has no wall covering or wall finishes.</p>
R703.3.1	Siding Clearance at Wall and Adjacent Surfaces	This Code Section is not referenced in the current 2018 International Residential Codes	R703.3.1 Siding Clearance at Wall and Adjacent Surfaces Unless otherwise specified by the cladding manufacturer or this code, polypropylene, insulated vinyl and vinyl claddings shall have clearance of not less than 6 inches (152 mm) from the ground and not less than 1/2 inch (13 mm) from other adjacent surfaces (decks, roofs, slabs).
R705.1	BIPV Listing Required	This Code Section is not referenced in the current 2018 International Residential Codes	In addition to complying with other provisions of this code, building-integrated photovoltaic (BIPV) systems used as exterior wall coverings or fenestration shall be listed and labeled in accordance with UL 1703 or both UL 61730-1 and UL 61730-2.

R905.1.1	Roofing Underlayment	<p>Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and photovoltaic shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). Underlayment shall be applied in accordance with Table R905.1.1(2). Underlayment shall be attached in accordance with Table R905.1.1(3).</p>	<p>Underlayment in accordance with this section is required for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and building-integrated photovoltaic (BIPV) roof coverings shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226; D1970; D2626; D4869; D6380, Class M; D6757; or D8257 shall bear a label indicating compliance to the standard designation and, if applicable, type classification indicated in Table R905.1.1(1). Underlayment shall be applied in accordance with Table R905.1.1(2). Underlayment shall be fastened in accordance with Table R905.1.1(3).</p> <p>Exception: Structural metal panels that do not require a substrate or underlayment.</p>
R905.5.6.	Wind Resistance of Mineral-Surfaced Roll Roofing	This Code Section is not referenced in the current 2018 International Residential Codes	Mineral-surfaced roll roofing shall be installed to resist the component and cladding loads specified in Table R301.2.1(1), adjusted for height and exposure in accordance with Table R301.2.1(2).
R905.6.5.	Wind Resistance of Slate Shingles		<p>R905.6.5 Wind Resistance of Slate Shingles Slate shingles shall be tested in accordance with ASTM D3161. Slate shingle packaging shall bear a label indicating compliance with ASTM D3161 and the required classification in Table R905.6.5.</p>
R905.7.1	Sheathing Requirements (wood shingles)	Wood shingles shall be installed on solid or spaced sheathing. Where spaced sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners.	Wood shingles shall be fastened to wood structural panels, solid lumber sheathing or spaced lumber sheathing. Where spaced lumber sheathing is used, sheathing boards shall be not less than 1-inch by 4-inch (25 mm by 102 mm) nominal dimensions and shall be spaced on centers equal to the weather exposure to coincide with the placement of fasteners. Where 1-inch by 4-inch (25 mm by 102 mm) spaced sheathing is installed at 10 inches (254 mm) or greater, additional 1-inch by 4-inch (25 mm by 102 mm) boards shall be installed between the sheathing boards. Where wood shingles are installed over spaced sheathing and the underside of the shingles are exposed to the attic space, the attic shall be ventilated in accordance with Sections R806.1, R806.2, R806.3 and R806.4. The shingles shall not be backed with materials that will occupy the required air gap space and prevent the free movement of air on the interior side of the spaced sheathing.
R905.9.4	Wind Resistance of Built-Up Roofs	This Code Section is not referenced in the current 2018 International Residential Codes	Built-up roof coverings shall be tested in accordance with FM 4474, UL 580 or UL 1897 and installed to resist the component and cladding loads specified in Table R301.2.1(1), adjusted for height and exposure in accordance with Table R301.2.1(2).

R905.10.5	Wind Resistance of Metal Roof Panels	This Code Section is not referenced in the current 2018 International Residential Codes	<p>Metal roof panels shall be installed to resist the component and cladding loads specified in Table R301.2.1(1), adjusted for height and exposure in accordance with Table R301.2.1(2). Metal roof panels applied to a solid or closely fitted deck shall be tested for wind resistance in accordance with FM 4474, UL 580, or UL 1897. Structural standing seam metal panel roof systems shall be tested for wind resistance in accordance with ASTM E1592 or FM 4474. Structural through-fastened metal panel roof systems shall be tested for wind resistance in accordance with ASTM E1592, FM 4474 or UL 580.</p> <p>Exceptions:</p> <p>Metal roofs constructed of cold-formed steel shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2208.1 of the International Building Code.</p> <p>Metal roofs constructed of aluminum shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2002.1 of the International Building Code.</p>
R905.16.7	Wind Resistance of BIPV Roof Panels	This Code Section is not referenced in the current 2018 International Residential Codes	BIPV roof panels shall be tested in accordance with UL 7103 and installed to resist the component and cladding loads specified in Table R301.2.1(1), adjusted for height and exposure in accordance with Table R301.2.1(2).

R908.3	Roof Replacement	<p>Roof replacement shall include the removal of existing layers of roof coverings down to the roof deck.</p> <p>Exception: Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905.</p>	<p>Roof replacement shall include the removal of existing layers of roof coverings down to the roof deck.</p> <p>Exceptions:</p> <p>Where the existing roof assembly includes an ice barrier membrane that is adhered to the roof deck and the existing sheathing is not water soaked or deteriorated to the point that it is not adequate as a base for additional roofing, the existing ice barrier membrane shall be permitted to remain in place and covered with an additional layer of ice barrier membrane in accordance with Section R905 where permitted by the roof covering manufacturer and new ice barrier underlayment manufacturer.</p> <p>Where the existing roof includes a self-adhered underlayment and the existing sheathing is not water soaked or deteriorated to the point that it is not adequate as a base for additional roofing, the existing self-adhered underlayment shall be permitted to remain in place and covered with an underlayment complying with Table R905.1.1(1), Table R905.1.1(2) and Table R905.1.1(3).</p> <p>Where the existing roof includes one layer of self-adhered underlayment and the existing layer cannot be removed without damaging the roof deck, a second layer of self-adhered underlayment is permitted to be installed over the existing self-adhered underlayment provided that the following conditions are met:</p> <p>It is permitted by the roof covering manufacturer and new self-adhered underlayment manufacturer.</p> <p>The existing sheathing is not water soaked or deteriorated to the point that it is not adequate as a base for additional roofing.</p> <p>The second layer of self-adhered underlayment is installed such that buildup of material at walls, valleys, roof edges, end laps, and side laps does not exceed two layers.</p>

N1101.2	Energy Efficiency	<p>This chapter shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each building. This chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This chapter is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.</p>	<p>This chapter provides market-driven, enforceable requirements for the design and construction of residential buildings, providing minimum efficiency requirements for buildings that result in the maximum level of energy efficiency that is safe, technologically feasible, and life cycle cost-effective, considering economic feasibility, including potential costs and savings for consumers and building owners, and return on investment. Additionally, the code provides jurisdictions with optional supplemental requirements, including requirements that lead to achievement of zero energy buildings, presently, and, through glide paths that achieve zero energy buildings by 2030 and on additional timelines sought by governments, and achievement of additional policy goals as identified by the Energy and Carbon Advisory Council and approved by the Board of Directors. The code may include nonmandatory appendices incorporating additional energy efficiency and greenhouse gas reduction resources developed by the International Code Council and others. Requirements contained in the code will include, but not be limited to, prescriptive- and performance-based pathways. The code will aim to simplify code requirements to facilitate the code's use and compliance rate. The code is updated on a 3-year cycle with each subsequent edition providing increased energy savings over the prior edition. The IECC residential provisions shall include an update to Chapter 11 of this code. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this intent. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.</p>
N1101.5.2.	Solar Ready Systems	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>Where a solar-ready zone is provided, the construction documents shall indicate details for a dedicated roof area for the solar-ready zone, roof dead load, roof live load, ground snow load and the routing of conduit or prewiring from the solar-ready zone to an electrical service panel or plumbing from the solar-ready zone to a service water heating system.</p>
N1102.1.5.	Component Performance Alternative	<p>Where the total building thermal envelope UA, the sum of U-factor times assembly area, is less than or equal to the Total UA resulting from multiplying the U-factors in Table N1102.1.4 by the same assembly area as in the proposed building, the building shall be considered to be in compliance with Table N1102.1.2. The UA calculation shall be performed using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. In addition to UA compliance, SHGC requirements shall be met.</p>	<p>Where the proposed total building thermal envelope thermal conductance (TCp) is less than or equal to the required total building thermal envelope thermal conductance (TCr) using factors in Table N1102.1.2, the building shall be considered to be in compliance with Table N1102.1.2. The total thermal conductance (TC) shall be determined in accordance with Equation 11-5. Proposed U-factors and slab-on-grade F-factors shall be taken from ANSI/ASHRAE/IES 90.1 Appendix A or determined using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. In addition to TC compliance, the SHGC requirements of Table N1102.1.2 and the maximum fenestration U-factors of Section N1102.6 shall be met.</p>

N1102.5.1.3.	Maximum Air Leakage Rate	<p>N1102.4 (R402.4) Air Leakage (Mandatory)</p> <p>The building thermal envelope shall be constructed to limit air leakage in accordance with the requirements of Sections N1102.4.1 through N1102.4.5.</p>	<p>Where tested in accordance with Section N1102.5.1.2, the air leakage rate for buildings, dwelling units or sleeping units shall be as follows:</p> <p>Where complying with Section N1101.13.1, the building or the dwelling units or sleeping units in the building shall have an air leakage rate not greater than 4.0 air changes per hour in Climate Zones 0, 1 and 2; 3.0 air changes per hour in Climate Zones 3 through 5; and 2.5 air changes per hour in Climate Zones 6 through 8.</p> <p>Where complying with Section N1101.13.2 or N1101.13.3, the building or the dwelling units or sleeping units in the building shall have an air leakage rate not greater than 4.0 air changes per hour, or 0.22 cubic feet per minute per square foot [1.1 L/(s × m²)] of the building thermal envelope area or the dwelling testing enclosure area, as applicable.</p> <p>Exceptions:</p> <p>Where dwelling units or sleeping units are attached or located in an R-2 occupancy, and are tested without simultaneously testing adjacent dwelling units or sleeping units, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4 L/(s × m²)] of the testing unit enclosure area. Where adjacent dwelling units are simultaneously tested in accordance with ASTM E779, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4 L/(s × m²)] of the testing unit enclosure area that separates conditioned space from the exterior.</p> <p>Where buildings have 1,500 square feet (139.4 m²) or less of conditioned floor area, the air leakage rate is permitted to be not greater than 0.27 cubic feet per minute per square foot [1.4L/(s × m²)].</p>
N1103.13	Gas Fireplaces Efficiency	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>Gas fireplace systems shall not be equipped with a continuous pilot and shall be equipped with an on-demand pilot, intermittent ignition or interrupted ignition, as defined by ANSI Z21.20.</p> <p>Exception: Gas-fired appliances using pilots within a listed combustion safety device.</p> <p>Vented gas fireplace heaters shall have a fireplace efficiency (FE) rating not less than 50 percent as determined in accordance with CSA P.4.1 and shall be listed and labeled in accordance with CSA/ANSI Z21.88. Vented gas fireplaces (decorative appliances) shall be listed and labeled in accordance with CSA/ANSI Z21.50.</p>
M1411.2.	Refrigeration System Listing	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>Refrigeration systems using Group A2L refrigerants shall be listed and labeled to UL/CSA 60335-2-40. Refrigeration systems using Group A1 refrigerants shall be listed to UL/CSA 60335-2-40 or UL 1995. The equipment shall be installed in accordance with the listing.</p>

M1411.3	Refrigeration System Installation	This Code Section is not referenced in the current 2018 International Residential Codes	Refrigeration systems shall be installed in accordance with the manufacturer's installation instructions. After installation, the manufacturer's installation instructions, owner's manuals, service manuals and any other product literature provided with the equipment shall be attached to the indoor unit or left with the homeowner.
M1411.4	Field-Installed Accessories	This Code Section is not referenced in the current 2018 International Residential Codes	Field-installed accessories shall be installed in accordance with the accessory and equipment manufacturer's installation instructions. Accessories installed in the ductwork of Group A2L refrigeration systems shall not contain electric heating elements, open flames, or devices switching electrical loads greater than 2.5 kVA.
M1411.5	Signs and Identification	This Code Section is not referenced in the current 2018 International Residential Codes	Each refrigeration system using Group A2L refrigerant shall have the following information legibly and permanently indicated on a markable label provided by the equipment manufacturer. Contact information of the responsible company that installed the refrigeration system. The system refrigerant charge and the refrigerant number.
M1411.6	Refrigerant Charge	This Code Section is not referenced in the current 2018 International Residential Codes	Refrigeration systems shall have refrigerant charge in compliance with the equipment manufacturer's installation instructions and the requirements of the listing. Group A2L refrigerant charge for an individual refrigeration system shall not exceed 34.5 pounds (15.7 kg).
M1411.7	Refrigerant Piping Testing	This Code Section is not referenced in the current 2018 International Residential Codes	The piping system containing Group A2L refrigerant shall be tested in accordance with the manufacturer's installation instructions and the requirements of the listing.
M1505.5	Local Exhaust Rates	This Code Section is not referenced in the current 2018 International Residential Codes	Local exhaust systems shall be designed to have the capacity to exhaust the minimum airflow rate determined in accordance with Table M1505.5 at one or more speed settings. The listed exhaust airflow rate for a bathroom or toilet room exhaust fan shall equal or exceed the exhaust airflow rate in Table M1505.5 at a minimum static pressure of 0.25 inch w.c. at one or more speed settings in accordance with Section M1505.3.

M2002.4.1.	Requirements for Discharge Pipe	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.	The discharge piping serving a pressure relief valve, temperature relief valve or combination valve shall: Not be directly connected to the drainage system. Discharge through an air break located in the same room as the boiler. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air break. Serve a single relief device and shall not connect to piping serving any other relief device or equipment. Discharge to the floor, to the pan serving the boiler or storage tank, to a waste receptor or to the outdoors. Discharge in a manner that does not cause personal injury or structural damage. Discharge to a termination point that is readily observable by the building occupants. Not be trapped. Be installed to flow by gravity. Terminate not more than 6 inches (152 mm) above the floor or waste receptor flood level rim. Not have a threaded connection at the end of the piping. Not have valves or tee fittings. Be constructed of those materials indicated in Section P2906.5 or materials tested, rated and approved for such use in accordance with ASME A112.4.1.
G2407.12	Protection From Fumes and Gases	Where corrosive or flammable process fumes or gases, other than products of combustion, are present, means for the disposal of such fumes or gases shall be provided. Such fumes or gases include carbon monoxide, hydrogen sulfide, ammonia, chlorine and halogenated hydrocarbons. In barbershops, beauty shops and other facilities where chemicals that generate corrosive or flammable products, such as aerosol sprays, are routinely used, nondirect vent-type appliances shall be located in a mechanical room separated or partitioned off from other areas with provisions for combustion air and dilution air from the outdoors. Direct-vent appliances shall be installed in accordance with the appliance manufacturer's instructions.	Where chemicals that generate corrosive or flammable products such as aerosol sprays are routinely used, one of the following shall apply to fired appliances where these chemicals can enter combustion air: Fired appliances shall be located in a mechanical room separate or partitioned off from other areas with provisions for combustion and dilution air from outdoors. The appliances shall be direct vent and installed in accordance with the appliance manufacturer's installation instructions.
G2415.12	Piping System Installations	G2415.12 (404.12) Minimum Burial Depth Underground piping systems shall be installed a minimum depth of 12 inches (305 mm) below grade, except as provided for in Section G2415.12.1.	This Section Amended. G2415.12 (IFGC 404.12) Minimum burial depth. Underground piping systems shall be installed at a minimum depth of 18 inches (305 mm) below grade for all piping types

G2417.4.1.	Test Pressure	The test pressure to be used shall be not less than 1 1/2 times the proposed maximum working pressure, but not less than 3 psig (20 kPa gauge), irrespective of design pressure. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the piping greater than 50 percent of the specified minimum yield strength of the pipe.	This Section Amended. Delete it in its entirety and replace with the following: Test pressure shall be minimum 10psi for minimum of 10 minutes.
P2503.5.2	Drainage and Vent Final Test	Rough-in and finished plumbing installations of drain, waste and vent systems shall be tested in accordance with Sections P2503.5.1 and P2503.5.2.	The final test of the drainage and vent system shall be visual to determine compliance with the provision of this code. Each fixture shall be filled and then drained. Traps and fixture connections shall be proven watertight.
P2603.5.1.	Sewer Depth	Building sewers that connect to private sewage disposal systems shall be not less than [NUMBER] inches (mm) below finished grade at the point of septic tank connection. Building sewers shall be not less than [NUMBER] inches (mm) below grade.	This Section Amended. P2603.5.1 Sewer depth. INSERT [number] as "12" (305 mm) in both locations.
P2604.3	Backfilling	Backfill shall be free from discarded construction material and debris. Backfill shall be free from rocks, broken concrete and frozen chunks until the pipe is covered by not less than 12 inches (305 mm) of tamped earth. Backfill shall be placed evenly on both sides of the pipe and tamped to retain proper alignment. Loose earth shall be carefully placed in the trench in 6-inch (152 mm) layers and tamped in place.	This Section Amended. Change 12" clean to 6" clean. Add to end of 2nd sentence "...6 inches of tamped earth for water service, building drain and building sewer"
P2717.2	Dishwasher Waste Connection	The combined discharge from a dishwasher and a one- or two-compartment sink, with or without a food-waste disposer, shall be served by a trap of not less than 1 1/2 inches (38 mm) in outside diameter. The dishwasher discharge pipe or tubing shall rise to the underside of the counter and be fastened or otherwise held in that position before connecting to the head of the food-waste disposer or to a wye fitting in the sink tailpiece.	The waste connection of a dishwasher shall connect directly to a wye branch fitting on the tailpiece of the kitchen sink, directly to the dishwasher connection of a food waste disposer, or through an air break to a standpipe. The waste line of the dishwasher shall rise and be securely fastened to the underside of the sink rim or countertop. Where a waste line drains into a standpipe, the waste line shall be securely fastened to the top of the standpipe.
P2801.2.3.	Equipment and Insulation in Pans	This Code Section is not referenced in the current 2018 International Residential Codes	Where appliances, equipment or insulation are subject to water damage when auxiliary drain pans fill, such portions of the appliance, equipment and insulation shall be installed above the flood level rim of the pan. Supports located inside the pan to support the appliance or equipment shall be water resistant and approved
E3404.14	Reconditioned Equipment	This Code Section is not referenced in the current 2018 International Residential Codes	Reconditioned equipment shall be permitted except where prohibited elsewhere in this code. Equipment that is restored to operating condition shall be reconditioned with identified replacement parts, verified under applicable standards, that are either provided by the original equipment manufacturer or that are designed by an engineer experienced in the design of replacement parts for the type of equipment being reconditioned. [110.20]

E3408	In Site	This Code Section is not referenced in the current 2018 International Residential Codes	Where this code specifies that one piece of equipment shall be "in site" "within site from", or "within site of" another piece of equipment, the specified equipment shall be visible of not more than 50 feet distant from the other.
E3407.2.2	E3407.2.2 Equipment Grounding Conductors 4 AWG and Larger AWG	This Code Section is not referenced in the current 2018 International Residential Codes	Equipment grounding conductors 4 AWG and larger AWG that are not identified in accordance with Section E3407.2.1 shall, at the time of installation, be permanently identified as an equipment grounding conductor at each end and at every point where the conductor is accessible, except where such conductors are bare. The required identification for conductors 4 AWG and larger shall encircle the conductor and shall be accomplished by one of the following: Stripping the insulation or covering from the entire exposed length. Coloring the exposed insulation or covering green at the termination. Marking the exposed insulation or covering with green tape or green adhesive labels at the termination. [250.119(B)] Exceptions: Conductors 4 AWG and larger shall not be required to be identified in conduit bodies that do not contain splices or unused hubs. [250.119(B)(1) Exception] Power-limited, Class 2 or Class 3 circuit cables containing only circuits operating at less than 50 volts shall be permitted to use a conductor with green insulation for other than equipment grounding purposes. [250.119 Exception No. 1]
E3703.8	Dishwasher and Garbage Disposal.	This Code Section is not referenced in the current 2018 International Residential Codes	New Section Added. E3703.8 Dishwasher and garbage disposer branch circuits – Dwelling units. In residential occupancies, dishwasher and garbage disposer may be on the same 20-ampere branch circuit.
E3611.1.1.	Indoor Communications	This Code Section is not referenced in the current 2018 International Residential Codes	For indoor communications purposes only, the grounding electrode conductor connection shall be a listed sheet metal strap-type ground clamp having a rigid metal base that seats on the electrode and having a strap of such material and dimensions that it is not likely to stretch during or after installation. [250.70(B)]
E3702.3	Ten-Ampere Branch Circuits	This Code Section is not referenced in the current 2018 International Residential Codes	A 10-ampere branch circuit shall comply with the following: A 10-ampere branch circuit shall be permitted to supply one or more of the following: lighting outlets, dwelling unit exhaust fans on bathroom or laundry room lighting circuits, and a gas fireplace unit supplied by an individual branch circuit. A 10-ampere branch circuit shall not supply receptacle outlets, fixed appliances except as permitted for individual branch circuits, garage door openers and laundry equipment. [210.23(A)(1) and (2)]

E3901.4.2.	Kitchen Receptacle on Island	<p>E3901.4.2 Island Countertop Spaces At least one receptacle outlet shall be installed at each island countertop space with a long dimension of 24 inches (610 mm) or greater and a short dimension of 12 inches (305 mm) or greater. [210.52(C)(2)]</p>	<p>This Section Amended. E3901.4.2 Island and Peninsular Countertops and Work Surfaces Receptacle outlets, if installed to serve an island or peninsular countertop or work surface, shall be installed in accordance with Section E3901.4.3. If a receptacle outlet is not provided to serve an island or peninsular countertop or work surface, provisions shall be provided at the island or peninsula for future addition of a receptacle outlet to serve the island or peninsular countertop or work surface. . E3901.4.2 kitchen receptacles on islands and peninsulas to be amended to reflect 2018 code language</p>
E3902.14	Outdoor Outlets.	<p>E3901.7 Outdoor Outlets Diagram Not less than one receptacle outlet that is readily accessible from grade level and located not more than 6 feet, 6 inches (1981 mm) above grade, shall be installed outdoors at the front and back of each dwelling unit having direct access to grade level. Balconies, decks, and porches that are accessible from inside of the dwelling unit shall have at least one receptacle outlet accessible from the balcony, deck, or porch. The receptacle shall be located not more than 6 feet, 6 inches (1981 mm) above the balcony, deck, or porch surface. [210.52(E)]</p>	<p>This Section Amended. E3902.14 Outdoor Outlets All outdoor outlets, including outlets installed in the following locations, and supplied by single-phase branch circuits rated 150 volts or less to ground, 50 amperes or less, shall be provided with GFCI protection: Garages that have floors located at or below grade level. Accessory buildings. Boathouses. Exceptions: GFCI protection shall not be required on lighting outlets other than those covered in Section 210.8(F) of NFPA 70. GFCI protection shall not be required for receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment where such equipment is protected as required by NFPA 70. 20. E3902.14 "OUTDOOR OUTLETS" EXCEPTIONS: 3. IS HEREBY AMENDED TO DELETE THE SECOND SENTENCE AND READ AS FOLLOWS: EXCEPTIONS: 3. GFCI PROTECTION SHALL NOT BE REQUIRED FOR LISTED HVAC EQUIPMENT.</p>

E3902.18	Receptacles Not Required to Be GFCI Protected	This Code Section is not referenced in the current 2018 International Residential Codes	<p>The following receptacles shall not be required to be ground-fault circuit-interrupter protected:</p> <p>Receptacles that are not readily accessible and are supplied by a branch circuit dedicated to electric snow-melting, deicing, or pipeline and vessel heating equipment where such equipment is protected as required by NFPA 70. [210.8(A) Exception No. 1]</p> <p>A receptacle supplying only a permanently installed premises security system. [210.8(A) Exception No. 2]</p> <p>Listed weight-supporting ceiling receptacles (WSCR) utilized in combination with compatible weight-supporting attachment fittings (WSAF) installed for the purpose of supporting a ceiling luminaire or ceiling-suspended fan shall be permitted to omit ground-fault circuit-interrupter protection. If a general-purpose convenience receptacle is integral to the ceiling luminaire or ceiling-suspended fan, GFCI protection shall be provided. [210.8(A) Exception No. 3]</p> <p>Factory-installed receptacles that are not readily accessible and are mounted internally to bathroom exhaust fan assemblies shall not require GFCI protection unless required by the installation instructions or listing. [210.8(A) Exception No. 4]</p>
E3908.8.1.	Grounded Conductor Connections to Electric Ranges and Clothes Dryers	This Code Section is not referenced in the current 2018 International Residential Codes	<p>For existing branch circuit installations only, if an equipment grounding conductor is not present in the outlet or junction box, the frame of the appliance shall be permitted to be connected to the grounded conductor if all the following conditions in Items 1, 2 and 3 are met and the grounded conductor complies with either Item 4 or 5:</p> <p>The supply circuit is 120/240-volt, single-phase, 3-wire; or 208Y/120-volt derived from a 3-phase, 4-wire, wye-connected system.</p> <p>The grounded conductor is not smaller than 10 AWG copper or 8 AWG aluminum or copper-clad aluminum.</p> <p>Grounding contacts of receptacles furnished as part of the equipment are bonded to the equipment.</p> <p>The grounded conductor is insulated, or the grounded conductor is uninsulated and part of a Type SE service-entrance cable and the branch circuit originates at the service equipment.</p> <p>The grounded conductor is part of a Type SE service-entrance cable that originates in equipment other than a service. The grounded conductor shall be insulated or field covered within the supply enclosure with listed insulating material, such as tape or sleeving, to prevent contact of the uninsulated conductor with any normally noncurrent-carrying metal parts.</p>

E4001.2.	Snap-Switch Terminations	<p>E4001.2 CO/ALR Snap Switches Snap switches rated 20 amperes or less directly connected to aluminum conductors shall be marked CO/ALR. [404.14(C)]</p>	<p>Snap-switch terminations shall be in accordance with the following: Terminals of 15-ampere and 20-ampere snap switches not marked CO/ALR shall be used with copper and copper-clad aluminum conductors only. Terminals marked CO/ALR shall be permitted to be used with copper, aluminum and copper-clad aluminum conductors. Snap switches connected using screwless terminals of the conductor push-in-type construction (also known as conductor push-in terminals) shall be installed on not greater than 15-ampere branch circuits and shall be connected with only 14 AWG solid copper wire unless listed and marked for other types of conductors.</p>
E4001.16	Reconditioned Equipment	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>E4001.16 Reconditioned Equipment The following types of reconditioned switches shall not be permitted: Lighting, dimmer and electronic control switches. Snap switches of any type. Molded-case switches.</p>
E4002.3.	Receptacle Terminations	<p>This Code Section is not referenced in the current 2018 International Residential Codes</p>	<p>Receptacle terminations shall be in accordance with the following: Terminals of 15-ampere and 20-ampere receptacles not marked CO/ALR shall be used with copper and copper-clad aluminum conductors only. Terminals marked CO/ALR shall be permitted to be used with aluminum, copper, and copper-clad aluminum conductors. Receptacles installed using screwless terminals of the conductor push-in-type construction (also known as push-in terminals) shall be installed on not greater than 15-ampere branch circuits and shall be connected with only 14 AWG solid copper wire unless listed and marked for other types of conductors.</p>

E4002.11.	Bathtub and Shower Space	<p>E4002.11 Bathtub and Shower Space</p> <p>A receptacle shall not be installed within or directly over a bathtub or shower stall. [406.9(C)]</p>	<p>E4002.11 Bathtub and Shower Space</p> <p>Receptacles shall not be installed inside of the tub or shower within a zone measured 3 feet (914 mm) horizontally from the outside edge of the bathtub or shower stall, including the space outside the bathtub or shower stall space below the zone. The zone also includes the space measured vertically from the floor to 8 feet (2438 mm) above the top of the bathtub rim or shower stall threshold. The identified zone is all-encompassing and shall include the space directly over the bathtub or shower stall and the space below this zone, but not space separated by a floor, wall, ceiling, room door, window, or fixed barrier. [406.9(C)]</p> <p>Exceptions:</p> <p>Receptacles installed in accordance with Section E4209.4 shall be permitted. [406.9(C) Exception No. 1]</p> <p>In bathrooms with less than the required zone, the receptacle(s) required by Section E3901.6 shall be permitted to be installed opposite the bathtub rim or shower stall threshold on the farthest wall in the room. [406.9(C) Exception No. 2]</p> <p>Weight-supporting ceiling receptacles (WSCR) shall be permitted to be installed for listed luminaires that employ a weight-supporting attachment fitting (WSAF) in damp locations complying with Section E4003.11. [406.9(C) Exception No. 3]</p> <p>A single receptacle shall be permitted for an electronic toilet or personal hygiene device such as an electronic bidet seat. The receptacle shall be readily accessible and not located in the space between the toilet and the bathtub or shower. [406.9(C) Exception No. 4]</p>
E4004.10	Installation in Fire-Resistant Construction	This Code Section is not referenced in the current 2018 International Residential Codes	Luminaires marked "FOR USE IN NONFIRE-RATED INSTALLATIONS" shall not be used in fire-rated installations. Where a luminaire is recessed in fire-resistant material in a building of fire-resistant construction, the recessed luminaire shall satisfy one of the following:
			<p>The recessed luminaire shall be listed for use in fire-resistance-rated construction.</p> <p>The recessed luminaire shall be installed in or used with a luminaire enclosure that is listed for use in fire-resistance-rated construction.</p> <p>The recessed luminaire shall be listed and shall be installed in accordance with a tested fire-resistance-rated assembly. Where a tested fire-resistance-rated assembly allows the installation of a recessed fluorescent luminaire, a recessed LED luminaire of comparable construction shall be permitted. [410.116(C)]</p>

E4203.1.4.	GFCI Protection (swimming pool)	All 15- and 20-ampere, single phase, 125-volt receptacles located within 20 feet (6096 mm) of the inside walls of pools and outdoor spas and hot tubs shall be protected by a ground-fault circuit-interrupter. Outlets supplying pool pump motors supplied from branch circuits rated at 120 volts through 240 volts, single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel. [680.21(C) and 680.22(A)(4)]	All receptacles rated 125 volts through 250 volts, 60 amperes or less, located within 20 feet (6096 mm) of the inside walls of pools and outdoor spas and hot tubs shall be protected by a Class A ground-fault circuit interrupter. Outlets supplying all pool motors shall be provided with Class A ground-fault circuit-interrupter protection. [680.21(C) and 680.22(A)(4)] Exceptions: Receptacles and outlets that are part of listed equipment, with ratings not exceeding the low-voltage contact limit that are supplied by listed transformers or power supplies that comply with Section E4206.1, shall not be required to be provided with ground-fault protection. [680.5(B)] Exception] Listed low-voltage motors not requiring grounding, with ratings not exceeding the low-voltage contact limit that are supplied by listed transformers or power supplies that comply with Section E4206.1, shall be permitted to be installed without ground-fault protection. [680.21(C)] Exception]
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