AMENDED IRC-2012	IRC-2015	IRC-2018
	CHAPTER 1 SCOPE AND ADMINISTRATION	
	R101.2 Scope. The provisions of the International Residential Code for One- and Two-family Dwellings shall apply to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location. Removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures <u>not more than three stories above grade plane in height</u>. **Exceptions:** 1. Live/work units <u>located in townhouses and</u> complying with the requirements of Section 419 of the International Building Code shall be permitted to be <u>constructed in accordance with the International Residential Code for One- and Two-Family Dwellings</u>~~.built as one and two-family dwellings or townhouses~~. Fire suppression required by Section 419.5 of the International Building Code when constructed under the International Residential	**R101.2 Scope.** **Exceptions:** 1. Live/work units located in townhouses and complying with the requirements of Section 419 of the International Building Code. ~~shall be permitted to be constructed in accordance with the International Residential Code for One- and Two-Family Dwellings. Fire suppression required by Section 419.5 of the International Building Code when constructed under the International Residential Code for One- and Two-family Dwellings shall conform to Section P2940.~~ ~~2.~~ Owner-occupied lodging houses with five or fewer guestrooms. ~~shall be permitted to be constructed in accordance with the International Residential Code for One- and Two-family Dwellings where equipped with a fire sprinkler system in accordance with Section P2904.~~ 3. <u>A care facility with five or fewer persons receiving custodial care within a dwelling unit.</u> 4. <u>A care facility with five or fewer persons receiving medical care within a dwelling unit.</u> 5. <u>A care facility for five or fewer persons receiving care that are within a single-family dwelling unit.</u>

AMENDED IRC-2012	IRC-2015	IRC-2018
	Code for One- and Two-family Dwellings shall conform to Section P2940.	
	R104.8.1 Legal defense. New section.	
	R104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code. Compliance with the specific performance-based provisions of the International Codes shall be an alternative to the specific requirements of this code. Where the alternative material, design or methods of construction is not approved, the building official shall respond in writing, stating the reasons why the alternative was not approved. ~~in lieu of~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~specific requirements of this code shall also be permitted as an alternate.~~	
	R105.3.1.1 Determination of substantially improved or substantially damaged existing buildings in flood hazard areas. Add: For the purpose of this determination, a substantial shall mean any repair, reconstruction, rehabilitation, addition or improvement of a building or structure, the cost of which equals or exceeds 50 percent of the market value of the building or structure to its predamaged condition shall be considered substantial improvements regardless of the actual repair work performed. The term shall not include either of the following: 1. Improvements to a building or structure that are required to correct existing health, sanitary or safety code violations identified by the building official and that are the minimum necessary to ensure safe living conditions. 2. Any alteration of a historic building or structure, provided that the alteration will not preclude the continued designation as a historic building or structure. For the purposes of this exclusion, a	

AMENDED IRC-2012	IRC-2015	IRC-2018
	historic building shall be any of the following: 2.1. Listed or preliminarily determined to be eligible for listing in the National Register of Historic Places. 2.2. Determined by the Secretary of the U.S. Department of Interior as contributing to the historical significance of a registered historic district or a distinct preliminarily determined to qualify as an historic district. 2.3. Designation as historic under a state or local historic preservation program that is approved by the Department of Interior.	
	R106.1.3 Information on braced wall design. New section inserted.	
	CHAPTER 2 DEFINITIONS	
		R202 ACCESS (TO). That which enables a device, an appliance or equipment to be reached by ready access or by a means that first requires the removal or movement of a panel, door or similar obstruction.
	R202 ACCESSORY STRUCTURE. A structure that is accessory to and incidental to that	

AMENDED IRC-2012	IRC-2015	IRC-2018
	of the dwelling(s) and that is located on the same lot.	
	R202 ALTERNATING TREAD DEVICE. A device that has a series of steps between 50 and 70 degrees (0.87 and 1.22 rad) from horizontal, usually attached to a center support rail in an alternating manner so that the user does not have both feet on the same level at the same time.	
		R202 APPROVED SOURCE. An independent person, firm or corporation, approved by the building official, who is competent and experienced in the application of engineering principles to materials, methods and systems analysis.
		R202 BATTERY SYSTEM, STATIONARY STORAGE. A rechargeable energy storage system consisting of electrochemical storage batteries, battery chargers, controls and associated electrical equipment designed to provide electrical power to a building. The system typically used to provide standby and emergency power, an uninterruptable power supply. Load shedding, load sharing or similar capabilities.
	R202 BUILDING-INTEGRATED PHOTOVOLTAIC PRODUCT. A building product that incorporates photovoltaic modules and functions as a component of the building envelope.	
		R202 CARBON MONOXIDE ALARM. A single- or multiple-station alarm intended to detect carbon

AMENDED IRC-2012	IRC-2015	IRC-2018
		monoxide gas and alert occupants by a distinct audible signal. It incorporates a sensor, control components and an alarm notification appliance in a single unit.
		R202 CARBON MONOXIDE DETECTOR. A device with an integral sensor to detect carbon monoxide gas and transmit an alarm signal to a connected alarm control unit.
		R202 CHANGE OF OCCUPANCY. A change in the use of a building or portion of a building that involves a change in the application of the requirements of this code.
	R202 CIRCULATING HOT WATER SYSTEM. a specifically designed water distribution system where one or more pumps are operated in the service of hot water piping to circulate heated water from the water-heating equipment to fixtures and back to the water-heating equipment.	
	R202 CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.	
		R202 COLLAPSIBLE SOILS. Soils that exhibit volumetric reduction in response to partial or full weight wetting under load.
	R202 COLLECTION PIPE. Unpressurized pipe used within the collection system that drains on-site nonpotable water or rain-water to a storage tank by gravity.	

AMENDED IRC-2012	IRC-2015	IRC-2018
		R202 COMPRESSIBLESOILS. Soils that exhibit volumetric reduction in response to the application of load even in the absence of wetting or drying.
	R202 CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior or is integral to any opaque surface of the building envelope.	
		R202 CRAWL SPACE. An underfloor space that is not a basement.
	R202 CROSS-LAMINATED TIMBER. A prefabricated engineered wood product consisting of not less than three layers of solid-sawn lumber or structural composite lumber where the adjacent layers are cross-oriented and bonded with structural adhesive to form a solid wood element.	
	R202 DIRECT SYSTEM. A solar thermal system in which the gas or liquid in the solar collector loop is not separated from the load.	
	R202 DRAIN-BACK SYSTEM. A solar thermal system in which the fluid in the solar collector loop is drained from the collector into a holding tank under prescribed conditions.	

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	R202 ENGINEERED WOOD RIM BOARD. A full-depth structural composite lumber, wood structural panel, structural laminated timber or prefabricated wood I-joist member designed to transfer horizontal (shear) and vertical (compression) loads, provide attachment for diaphragm sheathing, siding and exterior deck ledgers and provide lateral support at the ends of floor or roof joists or rafters.	
	R202 ERI REFERENCE DESIGN. A version of the rated design that meets the minimum requirements of the 2006 International Energy Conservation Code.	
		R202 EXPANSIVE SOILS. Soils that exhibit volumetric increase or decrease (swelling or shrinking) in response to partial or full wetting or drying under load.
	R202 FACTORY-MADE AIR DUCT. A listed and labeled duct manufactured in a factory and assembled in the field In accordance with the manufacturer's instructions and conditions of listing.	
		R202 FENESTRATION, VERTICAL. Windows that are fixed or movable, opaque doors, glazed doors, glazed block and combination opaque and glazed doors installed in a wall at less than 15 degrees from vertical.

AMENDED IRC-2012	IRC-2015	IRC-2018
	R202 FIBER-CEMENT (BACKERBORD, SIDING, SOFFITT, TRIM AND UNDERLAYMENT) PRODUCTS. Manufactured thin section composites of hydraulic cementitious matrices and discrete nonasbestos fibers.	
	R202 FLEXIBLE AIR CONNECTOR. A conduit for transferring air between an air duct or plenum and an air terminal unit, an air inlet or air outlet. Such conduit is limited in its use, length and location.	
		R202 FULL-OPEN VALVE. A water control or shutoff component in the water supply system piping that, where adjusted for maximum flow, the flow path through the component's closure member is not a restriction in the component's through-flow area.
	R202 GYPSUM BOARD. The generic name for a family of sheet products consisting of a noncombustible core primarily of gypsum with paper surfacing. Gypsum wallboard, gypsum sheathing, gypsum base for gypsum veneer plaster, exterior gypsum soffit board, predecorated gypsum board and water-resistant gypsum backing board complying with the standards listed in Section R702.3 and Part IX of this code are types of gypsum board.	
	R202 HISTORIC BUILDINGS. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or	**R202 HISTORIC BUILDINGS.** A building or structure that is one or more of the following:

AMENDED IRC-2012	IRC-2015	IRC-2018
	designated as historic under an appropriate state or local law.	1. Listed, or certified as eligible for listing, by the State Historic Preservation Officer or Keeper of the National Register of Historic Places in the National Register of Historic Places. 2. Designated as historic under an applicable state or local law. 3. Certified as a contributing resource within a National Register-listed, or a state-designated or locally designated historic district. ~~Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.~~
		R202 IMPACT PROTECTIVE SYSTEM. Construction that has been shown by testing to withstand the impact of test missiles and that is applied, attached, or locked over exterior glazing.
	R202 INDIRECT SYSTEM. A solar thermal system in which the gas or liquid in the solar collector loop circulates between the solar collector and a heat exchanger and such gas or liquid is not drained from the system or supplied to the load during normal operation.	
	R202 INSULATED VINYL SIDING. A vinyl cladding product, with manufacturer-installed insulating material as an integral part of the cladding product, having a minimum R-value of R-2.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R202 INSULATED VINYL SIDING. A vinyl cladding product, with manufacturer-installed foam plastic insulating material as an integral part of the cladding product, having a thermal resistance of not less than R-2.	
International Electrical Code. The Electrical Code, whether the National Electrical Code or the International Electrical Code, as amended and adopted by the local jurisdiction.		
International Mechanical Code. The Mechanical Code, whether the Uniform Mechanical Code or the International Mechanical Code as amended and adopted by the local jurisdiction.		
International Plumbing Code. The Plumbing Code, whether the Uniform Plumbing Code or the International Plumbing Code, as amended and adopted by the local jurisdiction.		
International Fuel Gas Code. The Fuel Gas Code, whether NFPA 54 or the International Fuel Gas Code, as amended and adopted by the local jurisdiction.		
		R202 LOCKING-TYPE TAMPER-RESISTANT CAP. A cap designed to be unlocked by a specially designed tool or key to prevent the removal of the cap by means of hand-loosening or by commonly available tools.
	R202 MECHANICAL JOINT.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	1. A connection between pipes, fittings or pipes and fittings that is not welded, brazed, caulked, soldered, solvent cemented or heat-fused. 2. A general form of gas-or liquid-tight connections obtained by the joining of parts through a positive holding mechanical construction such as, but not limited to, flanged, screwed, clamped or flared connections.	
	R202 NAILABLE SUBSTRATE. A product or material such as framing, sheathing or furring, composed of wood or wood-based materials, or other materials or fasteners providing equivalent fastener withdrawal resistance.	
	R202 ON-SITE NONPOTABLE WATER REFUSE SYSTEMS. Water systems for the collection, treatment, storage, distribution and reuse of nonpotable water generated on site, including but not limited to greywater systems. This definition does not include rainwater harvested systems.	
	R202 PHOTOVOLTAIC MODULE. A complete, environmentally protected unit consisting of solar cells. Optic and other components, exclusive of a tracker,	

AMENDED IRC-2012	IRC-2015	IRC-2018
	designed to generate DC power where exposed to sunlight.	
	R202 PHOTOVOLTAIC PANEL. A collection of photovoltaic nodules, mechanically fastened together, wired and designed to provide a field-installable unit.	
	R202 PHOTOVOLTAIC PANEL SYSTEM. A system that incorporates discrete photovoltaic panels that convert solar radiation into electricity, including rack support systems.	
	R202 PHOTOVOLTAIC SHINGLES. A roof covering that resembles shingles and that incorporates photovoltaic modules.	
	R202 PALSTIC COMPOSITE. A generic designation that refers to wood-plastic composites and plastic lumber.	
	R202 POLYPROPYLENE SIDING. A shaped material, made principally from polypropylene homopolymer, or copopolymer, that in some cases contains fillers or reinforcements, that is used to clad exterior walls or buildings.	
	R202 RECLAIMED WATER. Nonpotable water that has been derived from the treatment of waste water by a facility or system licensed or permitted to produce water meeting the jurisdiction's water requirements for its intended uses. Also know as "Recycled Water".	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R202 REFLECTIVE DUCT INSULATION. A thermal insulation assembly consisting of one or more surfaces that have emittance of 0.1 or less, and that bound an enclosed air space or spaces.	
		R202 ROOF COATING. A fluid-applied, adhered coating used for roof maintenance or roof repair, or as a component of a roof covering system or roof assembly.
	R202 ROOF REPLACEMENT. The process of removing the existing roof covering, repairing any damages substrate and installing a new roof covering.	
	R202 SHINGLE FASHION. A method of installing roof or wall coverings, water-resistive barriers, flashing or other building components such that upper layers of material are placed overlapping lower layers of material to provide drainage and protect against water intrusion at unsealed penetrations and joints or in combination with sealed joints.	
	R202 SKYLIGHT AND SLOPED GLAZING. Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing materials in skylights, including unit skylights, tubular daylighting devices, solariums, sunrooms, roofs and sloped walls are included in this definition.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R202 SKYLIGHT UNIT. A factory assembled, glazed fenestration unit, containing one panel of glazing material, that allows for natural daylighting through an opening in the roof assembly while preserving the weather-resistant barrier of the roof.	
	R202 STAIRWAY, SPIRAL. A stairway with a plan view of closed circular form and uniform section-shaped treads radiating from a minimum-diameter circle.	
	R202 TUBULAR DAYLIGHTING DEVICE (TDD). A nonoperable fenestration unit primarily designed to transmit daylight from a roof surface to an interior ceiling via a tubular conduit. The basic unit consists of an exterior glazed weatherproof surface, a light-transmitting tube with a reflective interior surface, and an interior-sealing device such as translucent ceiling panel. The unit may be factory assembled, or field assembled from a manufactured kit.	
		R202 VAPOR DIFFUSION PORT. A passageway for conveying water vapor from an unvented attic to the outside atmosphere.
	R202 WASTE RECEPTOR. A floor sink, standpipe. Hib drain or a floor drain that receives the discharge of one or more indirect waste pipe.	

AMENDED IRC-2012	IRC-2015	IRC-2018
Whole-House Mechanical Ventilation System. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate. ~~For definition applicable in Chapter 11, see NI 101.9.~~		
	R202 WINDBORNE DEBRIS REGION. Areas within hurricane-prone regions located in accordance in accordance with one of the following: 1. Within 1 mile (1.61 km) of the costal mean high water line where the ultimate design wind speed, V_{alt} is 130 mph (58 m/s) or greater. 2. In areas where the ultimate design wind speed , V_{ult} is 140 mph (63.6 m/s) or greater, or Hawaii.	
	CHAPTER 3 BUILDING PLANNING	
	R301.2.1.1 Wind limitations and wind design required. **Exceptions:** Add 3. Fire cold-formed steel light-frame construction, the wind provisions of this code shall apply in accordance with the limitations of Sections R505, R603 and R804.	
	R301.2.1.1.1 Sunrooms. New section.	

AMENDED IRC-2012	IRC-2015	IRC-2018
TABLE R301.2(1) Amend Table R301.2(1) to read as follows:	**TABLE R301.2(1)** Revised.	
	TABLE R301.2(2) revised.	
	TABLE R301.2(3) revised.	
	FIGURE R301.2(4)A revised.	
	FIGURE R301.2(4)B revised.	
	FIGURE R301.2(7) revised.	
	R301.2.1.2.1 Application of ASTM E 1996. New section.	
	TABLE R301.2.1.3 revised.	
		R301.2.2 Seismic provisions. Buildings in Seismic Design Categories C, D_0,D_1, and D_2 shall be constructed in accordance with the requirements of this section and other seismic requirements of this code. The seismic provisions of this code shall apply as follows; 1. Townhouses in Seismic Design Categories C, D_0, D_1 and D_2. 2. Detached one- and two-family dwellings in Seismic Design Categories D_0, D_1 and D_2. Buildings in Seismic Design Category E shall be designed to resist seismic loads in accordance with the International Building Code, except where the seismic design category is reclassified to a lower seismic design category in accordance with Section R301.2.2.1. Components of buildings not required to be designed to resist seismic loads shall be constructed in accordance with the provisions of this code.
	R301.2.2.2.1 Weights of materials.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	Exceptions: Revise 1. Roof and ceiling dead loads not exceeding 25 pounds per square foot (1190 Pa) shall be permitted provided the wall bracing amounts in Section 602.10.3 are increased in accordance with Table R602.10.3(4). ~~Chapter 6 are increased in accordance with Table R301.2.2.2.1.~~	
		R301.2.2.5 Concrete construction. **Exception:** Detached one- and two-family dwellings in Seismic Design Category C with exterior above-grade concrete walls are allowed to comply with the requirements of Section R608.
	R301.3 Story height. Revise 1. For wood wall framing, the story height shall not exceed 11 feet 7 inches (3531 mm) and the laterally unsupported bearing ~~nearing~~ wall stud height permitted by Table R602.3(5) ~~plus a height of floor framing not to exceed 16 inches (406 mm~~). ~~**Exception.**~~ Deleted. Revise 2. For cold-formed steel wall framing, the story height shall not be more than 11 feet 7 inches (3531 mm) and the unsupported bearing wall clear height shall be not more than ~~a stud height of~~ 10 feet (3048 mm~~), plus a height of floor framing not to exceed 16 inches (406 mm).~~ . Revise 3. For masonry walls, the story height shall be not more than 13 feet 7 inches (4140 mm) and the bearing wall clear height shall be not greater than ~~a maximum bearing wall clear height of~~ 12 feet (3658 mm) ~~plus a~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~height of floor framing not to exceed 16 inches (406 mm)~~. Exception: An additional 8 feet (2438 mm) is permitted for gable end walls. Revise 5. For structural insulated panel (SIP) walls, the story height shall not be greater than 11 feet 7 inches (3531 mm) and the ~~maximum~~ bearing wall height per story as permitted by Section R610 ~~R613~~ tables shall not 10 feet (3048 mm) ~~plus a height of floor framing no to exceed 16 inches (406 mm)~~.	
	TABLE R301.7 Revised.	
SECTION R302.2 TOWNHOUSES		
Section R302.2 Townhouses. Each townhouse shall be considered a separate building and shall be separated by fire-resistance rated wall assemblies meeting the requirements of Section R302.1 for exterior walls. **Exceptions:** 1. A common 2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 id permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall, Electrical installations shall be installed I accordance with Chapters 33 through 42. Penetrations of electrical outlet boxes shall be installed in accordance with Section R302.4.	**R302.2 Townhouses.** Common walls separating townhouses shall be assigned a fire-resistance rating in accordance with Section R302.2, Item 1 or 2. The common wall shared by two townhouses shall be constructed without plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be in accordance with Chapters 34 through 43. Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4. ~~Each townhouse shall be considered a separate building and shall~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
2. Where the building is equipped throughout with an automatic sprinkler system, a common 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263 id permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Section R302.4.	~~be separated by fire-resistance-rated wall assemblies meeting the requirements of~~ Section ~~R302.1 for exterior walls.~~ ~~**Exception:** A common 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4.~~ 1. Where a fire sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263. 2. Where a fire sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-	

AMENDED IRC-2012	IRC-2015	IRC-2018
	resistance-rated wall assembly tested in accordance with ASTM E119 or UL 263.	
		R302.2.1 Double walls. New section.
SECTION R302.2.4 STRUCTURAL INDEPENDENCE		
Section R302.2.4 Structural Independence. Each individual townhouse shall be structurally independent. **Exceptions:** 1. Foundations supporting exterior walls or common walls. 2. Structural roof and wall sheathing from each unit may fasten to the common wall framing. 3. Nonstructural wall and roof coverings. 4. Flashing at termination of roof covering over common wall. 5. Townhouses separated by a common ~~1-hour~~ fire-resistance-rated wall as provided in Section R302.2.	**R302.2.4 Structural independence.** Each individual townhouse shall be structurally independent. Exceptions: 1. Foundations supporting exterior walls or common walls. 2. Structural roof and wall sheathing from each unit may fasten to the common wall framing. 3. Nonstructural wall and roof coverings. 4. Flashing at termination of roof covering over common wall. 5. Townhouses separated by a common ~~1-hour fire-resistance-rated~~ wall as provided in Section R302.2, Item 1 or 2.	
		R302.4.2 Membrane penetration. **Exceptions:** Add- 4. Ceiling membrane penetrations by listed luminaires or by luminaires protected with listed materials that have been tested for use in fire-resistance-rated assemblies and are installed in accordance with the instructions included in the listing.

AMENDED IRC-2012	IRC-2015	IRC-2018
	R302.6 Dwelling-garage fire separation. The garage shall be separated as required by Table R302.6. Openings in garage walls shall comply with Section R302.5. Attachment of gypsum board shall comply with Table R70 302.3.5. The wall separation provisions of Table R302.6 shall not ~~This provision does not~~ apply to garage walls that are perpendicular to the adjacent dwelling unit wall.	
	R302.10.1 Insulation. **Exception:** Revise 2. Cellulose fiber loose-fill insulation, that ~~which~~ is not spray applied, complying with the requirements of Section R302.10.3, shall only not be required to meet the smoke-developed index of not more than 450 and shall be required to meet a smoke-developed index of not more than 450 where tested in accordance with CAN/ULC S102.2.	
	R302.11.1 Fireblocking materials. Revise 8. Cellulose insulation installed as tested in accordance with ASTM E119 and UL 263, for the specific application.	
	R302.13 Fire protection of floors. New section inserted**.**	
SECTION R303.4 MECHANICAL VENTILATION		

AMENDED IRC-2012	IRC-2015	IRC-2018
~~**Section R303.4 Mechanical ventilation.** Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour when tested with a blower door at a pressure of 0.2 inch w.c. (50 Pa) in accordance with Section NI 102.4.1.2, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.~~		
	R303.5.1 Intake openings: Add **Exceptions:** 1. The 10-foot (3048 mm separation is not required where the intake opening is located 3 feet (914 mm) or greater below the contaminant source. 2. Vents and chimneys serving fuel-burning appliances shall be terminated in accordance with the applicable portions of Chapters 18 and 24. 3. Clothes dryer exhaust ducts shall be terminated in accordance with Section M1503.3.	
	R303.7 Stairway illumination. **Exception:** A switch is not required where remote, central or automatic control of lighting is provided. ~~An artificial light source is not required at the top and bottom landing, provided an artificial light~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~source is located directly over each stairway section.~~	
	R303.8 Exterior stairway illumination. New section.	
	R304.1 Minimum area. ~~Every dwelling unit shall have at least one~~ Habitable room that shall have not less than 70 square feet (6.5 in2~~) 120 square feet (11m2) of gross floor area~~.	
	R305.1 Minimum height. Habitable space, ~~hallways, bath rooms. Toilet rooms, laundry rooms~~ and portions of basements containing these spaces shall have a ceiling height of not less than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm). **Exceptions:** 1. For rooms with sloped ceilings, at least 50 percent of the required floor area of the room must have a ceiling height of at least 7 feet (2134 mm) and no portion of the required floor area may have a ceiling height of less than 5 feet (1524 mm). 2. The ceiling height above bathrooms and toilet room fixtures shall have a minimum ceiling height of not less than 6 feet 8 inches (2032 mm) above not less than 30 inches by 30 inches (762 mm) at the showerhead. ~~At the center of the front~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~clearance area for fixtures as shown in Figure R307.1. The ceiling height above fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a minimum ceiling height of 6 feet 8 inches (2032 mm) above a minimum area 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.~~ 3. Beams, girders ducts or other obstructions in basements containing habitable spaces shall be permitted to project to within 6 feet 4 inches (1931 mm) of the finished floor.	
	R308.4.2 Glazing adjacent to doors. Glazing in an individual fixed or operable panel adjacent to a door Shall be considered to be a hazardous location where the~~ nearest vertical edge of the glazing is within a 24-inch (610 mm) arc of either vertical edge of the door in a closed position and where the~~ bottom exposed edge of the glazing is less than 60 inches (1524 mm) above the floor or walking surface and it meets the following conditions: ~~shall be considered a hazardous location.~~ **1.** Where the glazing within 24 inches (610 mm) of either side of the door	

AMENDED IRC-2012	IRC-2015	IRC-2018
	in plane of the door in a closed position. **2.** Where the glazing is on a wall perpendicular to the plane of the door in a closed position and within 24 inches (610 mm) od=f the hinge wised of an in-swinging door.	
		R308.4.4.1 Structural glass baluster panels. New section**.**
	308.6.9.1 Comparative analysis for glass-glazed nit skylights. New section**.**	
	SECTION R310 EMERGENCY AND RESCUE OPENINGS. Section rewritten.	
		R310.1 Emergency escape and recue opening required. **Exception:** 1. Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet (18.58 m^2). 2. Where the dwelling or townhouse is equipped with an automatic sprinkler system installed in accordance with Section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided the basement has one of the following:

AMENDED IRC-2012	IRC-2015	IRC-2018
		2.1 One means of egress complying with Section R311 and one emergency escape and rescue opening. 2.2 Two means of egress complying with Section R311.
		R310.3.2.1 Ladder and steps. New section.
	R311.1 Means of egress. Add- The required egress door shall open directly into a public way or to a yard or court that opens to a public way.	
	R311.7.2 Headroom. **Exceptions:** Add- 2. The headroom for spiral stairways shall be in accordance with Section R311.7.10.1).	
	R3117.5.1 Risers. **Exceptions:** Add- 2. The riser height of a spiral stairway shall be in accordance with Section R311.7.10.1.	
	R311.7.5.2.1 Winder treads. **Exception:** The tread depth at spiral stairways shall be in accordance with Section R311.7.10.1.	
		R311.7.8.2 Handrail projections. New section.
		R311.7.8.3 Handrail. clearance. New section.
	R311.7.11 Alternating tread devices. New section and subsections .	**R311.7.11 Alternating tread devices.** **Exception**: Alternating tread devices are allowed to be used as an element of a means of egress for lofts, mezzanines and similar areas of 200 gross square

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		feet (18.6 m^2) or less where such devices do not provide exclusive access to a kitchen or bathroom.
	R311.7.12 Ship ladders. New section and subsections.	**R311.7.12 Ship ladders.** **Exception: Ships ladders.** Ships ladders are allowed to be used as an element of a means of egress for lofts, mezzanines and similar areas of 200 gross square feet (18.6 m^2) or less that do not provide exclusive access to a kitchen or bathroom.
	R311.8.1 Maximum slope. Ramps shall have a maximum slope of 1unit vertical in 12 units horizontal (8.3 percent slope). All other ramps shall have a maximum slope of 1 unit vertical in 8 units horizontal (12.5 percent).	
SECTION R313.1 TOWNHOUSE AUTOMATIC FIRE SPRINKLER SYSTEMS		
Section R3131.1 Townhouse automatic fire sprinkler system, An automatic residential fire sprinkler system shall be installed in townhouse. **Exception:** An automatic residential fire sprinkler system shall not be required when additions or alterations are mode to existing townhouses that do not have an automatic residential fire sprinkler system installed.		
Section R313.1.1 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.	**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section P2904 or NFPA 13D.	

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	R314.1 Smoke detection and notification. All smoke alarms shall comply with NFPA 72 and Section R314.	
	R314.1.1 Listing. Smoke alarms shall be listed and labeled in accordance with UL 217. Combination smoke and carbon monoxide alarms shall be listed in accordance with UL 217 and UL2034.	
	R314.2 Where required. Smoke alarms shall be provided in accordance with the section.	
	R314.2.1 New construction. Smoke alarms shall be provided in dwelling units.	
	R314.2.2 ~~R314.3.1~~ Alterations, repairs and additions. Where ~~When~~ alterations, repairs or additions requiring a permit occur, or when one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with smoke alarms located as required for new dwellings. **Exceptions:** 1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, the addition or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section. 2. Installation, alteration or repairs of plumbing or mechanical systems are	

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	exempt from the requirements of this section.	
SECTION R315.1 CARBON MONOXIDE ALARMS	**R314.3 Location.** Smoke alarms shall be installed in the following locations: 1. In each sleeping room. 2. Outside each separate sleeping area in the immediate vicinity of the bedrooms. 3. On each additional story of the dwelling, including basements and habitable attics but not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level. 4. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains bathtub or shower unless this would prevent placement of a smoke alarm required by Section R314.3.	
Section R315.1 Carbon monoxide alarms.	**R314.3.1 Installation near cooking appliances.** New section.	
	R314.4 ~~R314.5~~ Interconnection. Renumbered.	
	R314.5 Combination alarms. New section.	

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	R314.6 ~~R314.4~~ Power source. Smoke alarms shall receive their primary power from the building wiring when such wiring is served from a commercial source, and when primary power is interrupted, shall receive power from a battery. Wiring shall be permanent and without a disconnecting switch other than those required for overcurrent protection. Exceptions: 1. Smoke alarms shall be permitted to be battery operated when installed in buildings without commercial power. 2. Smoke alarms installed in accordance with Section R314.2.2 shall be permitted to be battery power. ~~Hard wiring of smoke alarms in existing areas shall not be required where the alterations or repairs do not result in the removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space or basement available which could provide access for hard wiring without the removal of interior finishes.~~	
	R314.7 Fire alarm systems. New section and subsections.	
Section R315.1 Carbon monoxide alarms. For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in	**R315.1 Carbon monoxide alarms**. For new construction, an approved carbon monoxide alarm shall be installed outside of each separate sleeping area in the	

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dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages with a communicating opening.	immediate vicinity of the bedrooms in dwelling units within which fuel-fired appliances are installed and in dwelling units that have attached garages.	
	R315.1.1 Listings. New section inserted**.**	
	R315.2 Where required. New section and subsections inserted.	
Section R315.3 Where required in existing dwellings. Where work requiring a permit occurs in existing dwellings, ~~that have attached garages or in existing dwellings within which fuel-fired appliances exist,~~ carbon monoxide alarms shall be provided in accordance with Section R315.1 for the following: 1. Mechanical or gas work requiring a permit in which fuel-fired appliances are being replaced or installed. Addition and/or renovation of attached garages with communicating openings requiring building permit.	**R315.3 Location. New section inserted.**	
	R315.4 Combination alarms. New section inserted.	
	R315.5 Power source. New section inserted.	**R315.5 Interconnectivity.** New section inserted.
	R315.6 Carbon monoxide detection systems. New section and subsections inserted.	

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	R316.4 Thermal barrier. Unless otherwise allowed in Section R316.5 or Section R316.6, foam plastic shall be separated from the interior of a building by an approved thermal barrier of not less than ~~minimum~~ wallboard, 23/32-inch (18.2 mm) wood structural panel, or a material that is tested in accordance with and meets the acceptance criteria of both the Temperature Transmission Fire Test and the Integrity Fire Test of NFPA 275.	
	R316.5.3 Attics. The thermal barrier specified in Section R316.4 is not required where all of the following apply: 1. Attic access is required by Section R807.1. 2. The space is entered only for purposes of repairs or maintenance. 3. The foam plastic insulation has been tested in accordance with Section R316.6 or the foam plastic insulation is protected against ignition using one of the following ignition barrier materials: 3.1. 1'/2-inch-thick (38 mm) mineral fiber insulation; 3.2. '/4-inch-thick (6.4 mm) wood structural panels; 3.3. V8-inch (9.5 mm) particleboard; 3.4. '/4-inch (6.4 mm) hardboard; 3.5. 3/8-inch (9.5 mm) gypsum board; ~~or~~	

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	3.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm); 3.7. 1'/,-inch-thick (38 mm) cellulose insulation; or 3.8. ¼-inch (6.4 mm) fiber-cement panel, soffit or backer board.	
	R316.5.4 Crawl spaces. The thermal barrier specified in Section R316.4 is not required where all of the following apply: 1. Crawlspace access is required by Section R408.4 2. Entry is made only for purposes of repairs or maintenance. 3. The foam plastic insulation has been tested in accordance with Section R316.6 or the foam plastic insulation is protected against ignition using one of the following ignition barrier materials: 3.1. l'/2-inch-thick (38 mm) mineral fiber insulation; 3.2. '/4-inch-thick (6.4 mm) wood structural panels; 3.3. 3/8-inch (9.5 mm) particleboard; 3.4. '/4-inch (6.4 mm) hardboard; 3.5. 3/g-inch (9.5 mm) gypsum board; or 3.6. Corrosion-resistant steel having a base metal thickness of 0.016 inch (0.406 mm).	**R316.5.4 Crawl spaces.** Add- 3.7 ¼-inch (6.4 mm) fiber-cement panel, soffit or backer board.

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	~~The above ignition barrier is not required where the foam plastic insulation has been tested in accordance with Section R316.6.~~	
	R316.5.11 Sill plates and headers. Foam plastic shall be permitted to be spray applied to a sill plate and headers or installed in the perimeter joist space without the thermal barrier specified in Section R316.4 subject to all of the following:	
	R316.5.12 Sheathing. Foam plastic insulation used as sheathing shall comply with Section R316.3 and Section R316.4. Where the foam plastic sheathing is exposed to the attic space at a gable or kneewall, the provisions of Section R316.5.3 shall apply. Where foam plastic Is used as an exterior wall sheathing on framed wall assemblies. It shall comply with Section R316.8.	
	R316.8 Wind resistance. New section.	
	R317.1.4 Wood columns. **Exceptions:** Add 3. Deck posts supported by concrete piers or metal pedestals projecting not less than 1 inch (25 mm) above a concrete floor or 6 inches (152 mm) above exposed earth.	

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	R317.3 Fasteners and connectors in contact with preservative-treated and fire-retardant-treated wood. Fasteners, including nuts and washers, and connectors in contact with preservative-treated wood and fire-retardant-treated wood shall be in accordance with this section. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153. Stainless steel driven fasteners shall be in accordance with the material requirements of ASTM F667.	
		R317.3.1 Fasteners for preservative-treated wood. Fasteners, including nuts and washers, for preservative-treated wood shall be of hot-dipped, zinc-coated galvanized steel, silicon bronze or copper. Staples shall be of stainless steel. Coatings types and weights for connectors in contact with the preservative-treated wood shall be in accordance with the connector manufacturer's recommendations. In absence of manufacturer's recommendations, a minimum of ASTM A 653 type G185 zinc-coated galvanized steel or equivalent, shall be used.
	R317.4 ~~Wood/~~plastic composites. ~~Wood/~~plastic composites used in exterior deck boards, stair treads, guards and handrails shall comply with the requirements of Section R507.3. ~~handrails and guardrail systems shall bear a label~~	

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	~~indicating the required performance levels and demonstrating compliance with the provisions of ASTM D7032.~~ ~~R317.4.1 Labeling. Deck boards and stair treads shall bear a label that indicates compliance to ASTM D 7032 and includes the allowable load and maximum allowable span. Handrails and guardrail systems or their packaging shall bear a label that indicates compliance to ASTM D 7032 and includes the maximum allowable span.~~ ~~R317.4.2 Installation. Wood/plastic composites shall be installed in accordance with the manufacturer's instructions.~~	
	R320.1.1 Guestrooms. New section.	
	R322.1 General. Buildings and structures constructed in whole or in part in flood hazard areas (including A or V Zones) as established in Table R301.2(l), and substantial improvement and restoration of substantial damage of buildings and structures in flood hazard areas, shall be designed and constructed in accordance with the provisions contained in this section. Buildings and structures that are located in more than one flood hazard	

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	area shall comply with the most restrictive flood hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.	
	R322.1.8 Flood-resistant materials. Building materials and installation methods used flor flooring and interior or exterior walls and wall coverings below the elevation required in Section R322.2 or R322.3 shall be flood damage-resistant materials that conform to the provisions of FEMA TB-2.~~used below the elevation required in Section R322.2 (flood hazard areas including A Zones) or R322.3 (coastal high-hazard areas including V Zones) shall comply with the following: 1. All wood, including floor sheathing, shall be pressure-preservative-treated in accordance with AWPA U1 for the species, product, preservative and end use or be the decay-resistant heartwood of redwood, black locust or cedars. Preservatives shall be listed in Section 4 of AWPA U1. 2. Materials and installation methods used for flooring and interior and exterior walls and wall coverings shall conform to the provisions of FEMA/FIA TB-2.~~	

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	R322.1.9 Manufactured homes. The bottom of the frame of new or replacement manufactured homes on foundations that conform to the requirements of Section R322.2 or R322.3, as applicable shall be elevated to or above the elevations specified in ~~accordance with~~ Section R322.2 (flood hazard areas including A Zones) or Section R322.3 in coastal high-hazard areas (V Zones). The anchor and tie-down requirements of the applicable state or federal requirements shall apply. ~~Sections AE604 andAE605 of Appendix E shall apply.~~ The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.	
	R322.2 Flood hazard areas (including A Zones). All areas that have been determined to be prone to flooding but not subject to high-velocity wave action shall be designated as flood hazard areas. Flood hazard areas that have been delineated as subject to wave heights between l'/2 feet (457 mm) and 3 feet (914 mm) shall be designated as Coastal A Zones and are subject to the requirements of Section R322.3. All building and structures constructed in whole or in part	

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	in flood hazard areas shall be designed and constructed in accordance with Sections R322.2.1 through R322.2.3.	
	R322.2.1Elevationrequirements. 1. Buildings and structures in flood hazard areas, including flood areas ~~not~~ designated as Coastal A Zones shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher. 2. ~~Buildings and structures in flood hazard areas designated as Coastal A Zones shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or to the design flood elevation, whichever is higher.~~ 3. In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated at least as high above the highest adjacent grade as the depth number specified in feet on the FIRM, or at least 3 feet (915 mm) ~~2 feet (610 mm)~~ if a depth number is not specified. 4. Basement floors that are below grade on all sides shall be elevated to or above the base flood elevations plus 1 foot (305 mm) or the design flood elevation, whichever is higher.	

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	Exception: Enclosed areas below the design flood elevation, including basements whose floors are not below grade on all sides, shall meet the requirements of Section R322.2.2.	
	R322.2.2 Enclosed area below design flood elevation. Enclosed areas, including crawl spaces, that are below the design flood elevation shall: 1. Be used solely for parking of vehicles, building access or storage. 2. Be provided with flood openings that meet the following criteria and are installed in accordance with Section R322.2.2.1: 2.1. ~~There shall be a minimum of two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings on exterior walls.~~ 2.2. The total net area of all openings shall be at least 1 square inch (645 mm2) for each square foot (0.093 m2) of enclosed area where the enclosed area is measured on the exterior of the enclosure wall, or the openings shall be designed as engineered openings and the construction documents shall include a statement by a	**R322.2.2 Enclosed area below design flood elevation**. Enclosed areas, including crawl spaces, that are below the design flood elevation shall: 1. Be used solely for parking of vehicles, building access or storage. 2. Be provided with flood openings that meet the following criteria and are installed in accordance with Section R322.2.2.1: 2.12.2. The total net area of ~~all~~ nonengineered openings shall be at least 1 square inch (645 mm2) for each square foot (0.093 m2) of enclosed area where the enclosed area is measured on the exterior of the enclosure wall, or the openings shall be designed as engineered openings and the construction documents shall include a statement by a registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24. 2.3. 2.4. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall.

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	registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.6.2.2 of ASCE 24. 2.3. ~~The bottom of each opening shall be 1 foot (305 mm) or less above the adjacent ground level.~~ 2.4. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall. 2.5. Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area. 2.6. <u>The presence of louvers, blades, screens and faceplates or other covers and devices shall allow the automatic flow of floodwater into and out of the enclosed areas and shall be accounted for in the determination of the net open air.</u> ~~Openings installed in doors and windows, that meet requirements 2.1 through 2.5, are acceptable; however, doors and windows without installed openings do not meet the requirements of this section.~~	2.5. Any louvers, screens or other opening covers shall allow the automatic flow of floodwaters into and out of the enclosed area. 2.6. The presence of louvers, blades, screens and faceplates or other covers and devices shall allow the automatic flow of floodwater into and out of the enclosed areas and shall be accounted for in the determination of the net open air.
	<u>R322.2.2.1 Installation of openings.</u> <u>New section.</u>	
	<u>R322.2.4 Tanks.</u> <u>New section.</u>	

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	R322.3 Coastal high-hazard areas (including V Zones <u>and Costal A Zone, where designated</u>). Areas that have been determined to be subject to wave heights in excess of 3 feet (914 mm) or subject to high-velocity wave action or wave-induced erosion shall be designated as coastal high-hazard areas. <u>Flood hazard areas that have been designated as subject to wave heights between 1 ½ feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Costal A Zones.</u> Buildings and structures constructed in whole or in part in coastal high-hazard areas <u>and costal A Zones, where designated,</u> shall be designed and constructed in accordance with Sections R322.3.1through R322.3.<u>7.</u>	
	R322.3.2 Elevation requirements. 1. ~~All~~ buildings and structures erected within coastal high-hazard areas <u>and Coastal A Zones,</u> shall be elevated so that the <u>bottom of the</u> lowest ~~portion of all~~ <u>horizontal</u> structural members supporting the lowest floor, with the exception of piling, pile caps, columns, grade beams and bracing, is <u>elevated to or above the base flood elevation plus 1 foot (305 mm) or the design flood elevation, whichever is higher</u>	

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	~~1.1. Located at or above the design flood elevation, if the lowest horizontal structural member is oriented parallel to the direction of wave approach, where parallel shall mean less than or equal to 20 degrees (0.35 rad) from the direction of approach, or~~ ~~1.2. Located at the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher, if the lowest horizontal structural member is oriented perpendicular to the direction of wave approach, where perpendicular shall mean greater than 20 degrees (0.35 rad) from the direction of approach.~~ 2. Basement floors that are below grade on all sides are prohibited. 3. The use of fill for structural support is prohibited. 4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways. ~~Exception:~~ 5. Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5	
	R322.3.3 Foundations. New section.	

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		322.3.4 Concrete slabs. New section inserted.
	R322.3.5.1 Protection of building envelope. New section.	
	R322.3.7 Tanks. New section.	**R322.3.7 Stairways and ramps.** New section inserted.
		R322.3.8 Decks and porches. New section inserted.
	SECTION R323 STORM SHELTERS. New section.	
	SECTION R324 SOALR ENERGY SYSTEMS. New section.	
		R324.3.1 Equipment listings. Photovoltaic panels and modules shall be listed and labeled in accordance with UL 1703. Inverters shall be listed and labeled in accordance with UL 1741. Systems connected to the utility grid shall use inverters listed for utility interaction.
		R324.4.1.1 Roof load. New section.
		R324.4.1.2 Wind load. New section.
		R324.4.2 Fire classification. New section.
		R324.4.3 Roof penetrations. New section.
		R324 6 Roof access and pathways. New section and subsections inserted.
		R324.5.2 Fire classification. New section.
	SECTION R325 MEZZANINES. New section.	
		R325.1 General. Mezzanines shall comply with Section R325 through R325.5. Habitable attics shall comply with Section R325.6.
		R325.3 Area limitation. **Exception:** The aggregate area of a mezzanine located within a dwelling unit equipped with a fire

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		sprinkler system in accordance with Section P2904 shall not be greater than one-half the floor area of the room, provided that the mezzanine meets all of the following requirements: 1. Except for enclosed bathrooms and closets, the mezzanine is open to the room in which such mezzanine is located. 2. The opening to the room is unobstructed except for walls not more than 42 inches (1067 mm) in height, columns and poles. 3. The exceptions to Section R325.5 are not applied.
		R325.6 Habitable attics. New section.
	SECTION R326 SWIIMING POOLS, SPAS AND HOT TUBS. New section.	
		SECTION R327 STATIONARY STORAGE BATTERY SYSTEMS. New sections and subsections.
	CHAPTER 4 FOUNDATIONS	
	R402 MASONRY. New section.	
	R403.1.1Minimum size. The minimum width, W, and thickness, T, for concrete footing shall be in accordance with Tables R403/1(1) through R403.1(3) and Figure R403.1(1) or R403.1.3, as applicable. ~~Minimum sizes for concrete and masonry footings shall be as set forth in Table R403.1and FigureR403.1(l).~~ The footing width~~, W,~~ shall be based on the load-bearing value of the soil in accordance	

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	with Table R401.4.1. ~~Spread footings shall be at least 6 inches (152 mm) in thickness,~~ ~~T.~~ Footing projections, P, shall be at least 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and project for fireplaces shall be in accordance with Section R100.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) andR403.1(3).	
	Table R403.1(1). Revised**.**	
	Table R403.1(2). Revised.	
	Table 403.1(3). Revised.	
	R403.1.2 Continuous footing in Seismic Design Categories D_0, D_1, and D_2. Exterior walls of buildings located in Seismic Design Categories D_0, D_1, D_2 shall be supported by continuous solid or fully grouted masonry or concrete footings. Other footing materials or systems shall be designed in accordance with accepted engineering practice. All required internal braced wall panels in buildings located Seismic Design Categories D_0, D_1, D_2 with plan dimensions greater than 50 feet (15 240 mm) shall be supported by continuous	

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	solid or fully grouted masonry or concrete footings in accordance with Section R403.1.3.4, with exception for two-story buildings in Seismic Design Category D_2, in which all braced wall panels, interior or exterior, shall be supported n continuous foundations. **Exceptions:** Two-story buildings shall be permitted to have internal braced wall panels supported on continuous foundations at intervals not exceeding 50 feet (15 240 mm) provided that: 1. The height of the cripple walls does not exceed 4 feet (1219 mm). 2. First-floor braced wall panels are supported in double floor joists, continuous blocking or floor beams. 3. The distance between bracing lines does not exceed twice the building width measured parallel to the braced wall. ~~braced wall panels at exterior walls of buildings located in Seismic Design Categories D0, D, and D2 shall be supported by continuous footings. All required interior braced wall panels in buildings with plan dimensions greater than 50 feet (15 240 mm) shall also be supported by continuous footings.~~	

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	R403.1.3 Footings and stem walls reinforcing in Seismic Design Categories D_0, D_1, and D_2. ~~Seismic Reinforcing.~~ New section**.**	
	R403.1.3.1 Concrete stem walls with concrete footings ~~Foundations with stem walls~~. New section**.**	
	R403.1.3.2 Masonry stem walls with concrete footings ~~Slabs-on-ground with turned-down footings~~. New section.	
	R403.1.3.2 Slabs-on-ground with turned-down footings. In Seismic Design Groups D_0, D_1, and D_2, slabs on ground casted monolithically with turned down footings shall have a minimum of one No.4 bar at the top and the bottom of the footing or one No. 5 bar or two No. 4 bars in the middle third of the footing depth. ~~Exception: For slabs-on-ground cast monolithically with the footing, locating one No. 5 bar or two No. 4 bars in the middle third of the footing depth shall be permitted as an alternative to placement at the footing top and bottom~~. Where the slab is not cast monolithically with the footing, No. 3 or larger vertical dowels with standard hooks on each end shall be installed at no more than 4 feet (1219 mm) on center ~~provided~~ in accordance with Figure R403.1.3~~.2.~~ Detail 2. Standard	

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	hooks shall comply with Section R608.5.4.5. ~~R611.5.4.5.~~	
	R403.1.3.4 Interior bearing and braced wall panel footings in Seismic Design Categories D_0, D_1, and D_2. New section.	
	R403.1.3.5 Reinforcement. New section and subsections.	
	Figure R403.1(1). Revised.	
	Figure R403.1(2). Revised.	
	Figure R403.1(3). Revised.	
	Figure R403.1.3 Revised.	
	R403.1.6 Foundation anchorage. New section.	
	TABLE R403.4. New table.	
	R404.1.1 Design required. New section.	
	R404.1.3 Concrete foundation walls. New section.	
	TABLE R404.1(1). Revised.	
	TABLE R404.1(2). Revised.	
	TABLE R404.1(3). Revised.	
	TABLE R404.1(4). Revised.	
	TABLE R404.2(2). Revised.	
	R404.1.3.1 Concrete cross-section. New section.	
	R404.1.3.2 Reinforcement for foundation walls. New section and subsections.	
	R404.1.3.3 Concrete, materials for concrete, and forms. New section and subsections.	
	TABLE R404.1.2(2). Revised.	

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	TABLE R404.1.2(3). Revised.	
	TABLE R404.1.2(4). Revised.	
	TABLE R404.1.2(5). Revised.	
	TABLE R404.1.2(6). Revised.	
	TABLE R404.1.2(7). Revised.	
	TABLE R404.1.2(8). Revised.	
	R404.1.3.4 Requirements for Seismic Design Category C. New section.	
	R404.4 Retaining walls. Retaining walls that are not laterally supported at the top and that retain in excess of 48 inches (1219 mm) ~~24 inches (610 mm)~~ of unbalanced fill, or retaining walls exceeding 24 inches (610 mm) in height that resist lateral loads in addition to soil, shall be designed in accordance with accepted engineering practice to ensure stability against overturning, sliding, excessive foundation pressure and water uplift. Retaining walls shall be designed for a safety factor of 1.5 against lateral sliding and overturning. This section shall not apply to foundation walls supporting buildings.	
	R405.1 Concrete or masonry foundations. Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable or usable spaces located below grade. Drainage tiles, gravel or crushed stone	

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	drains, perforated pipe or other approved systems or materials shall be installed at or below the area to be protected and shall dis charge by gravity or mechanical means into an approved drainage system. Gravel or crushed stone drains shall extend at least 1foot (305 mm) beyond the outside edge of the footing and 6 inches (152 mm) above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Except where otherwise recommended by the drain manufacturer, perforated drains shall be surrounded with an approved filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on a mini¬ mum of 2 inches (51mm) of washed gravel or crushed rock at least one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches (152 mm) of the same material. Exception: A drainage system is not required when the foundation is installed on well-drained ground or sand gravel mixture soils according to the Unified Soil	

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	Classification System, Group I Soils, as detailed in Table R405.1.	
		408.3 Unvented crawl space. Add- 2.4 Dehumidification sized to provide 70 pints (33 liters) of moisture removal per day for every 1,000 square feet (93 m^2) of crawl space floor area.
	CHAPTER 5 FLOORS	
	~~**R501.3 Fire protection of floors.**~~ Deleted**.**	
	R502.1 General ~~Identification~~. Wood and wood-based products used for load-support purposes shall conform to the applicable provisions of this section. ~~Load-bearing dimension lumber for joists, beams and girders shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.~~	
	R502.1.1 Sawn lumber. New section inserted	
	R502.1.4 ~~R502.1.6~~ Structural log members. Structural log members shall comply with the provisions of ICC-400. ~~Stress grading of structural log members~~	

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	~~of nonrectangular shape, as typically used in log buildings, shall be in accordance with ASTM D3957. Such structural log members shall be identified by the grade mark of an approved lumber grading or inspection agency. In leu of a grade mark on the material, a certificate of inspection as to species and grade issued by a lumber-grading or inspection agency meeting the requirements of this section shall be permitted to be accepted.~~	
	R502.1.6 Cross-laminated timber. New section.	
	R502.1.7 Engineered wood rim board. New section.	
	R502.2.2 ~~R502.1.2~~ Blocking and subflooring. Section renumbered.	
	R502.5 Allowable girder spans. The allowable spans of girders fabricated of dimension lumber shall not exceed the values set forth in Tables R602.7(1), R702.7(2) and R602.7(3) ~~R502.5(l) and R502.5(2~~).	
		R502.6 Bearing. The ends of each joist, beam or girder shall not have less than 1 ½ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on masonry or concrete, except where supported on a 1-inch by 4-inch (25 mm by 102 mm) ribbon strip and nailed to the adjacent stud or by the use of approved joist hangers. Alternatively, the

AMENDED IRC-2012	IRC-2015	IRC-2018
		ends of joists shall be supported on a 1-inch by 4-inch (25 mm by 102 mm) ribbon strip and shall be nailed to the adjacent stud. The bearing on masonry or concrete shall be direct, or a sill plate of 2-inch minimum (51 mm) nominal thickness, shall be provided under the joist, beam or girder. The sill plate shall provide a minimum nominal bearing area of 48 square inches (30 865 mm).
	R502.10 Framing of openings. Openings in floor framing shall be framed with a header and trimmer joists. When the header joist span does not exceed 4 feet (1219 mm), the header joist may be a single member the same size as the floor joist. Single trimmer joists may be used to carry a single header joist that is located within 3 feet (914 mm) of the trimmer joist bearing. When the header joist span exceeds 4 feet (1219 mm), the trimmer joists and the header joist shall be doubled and of sufficient cross section to support the floor joists framing into the header. ~~Approved hangers shall be used for the header joist to trimmer joist connections when the header joist span exceeds 6 feet (1829 mm). Tail joists over 12 feet (3658 mm) long shall be supported at the header by framing anchors or on ledger strips not less than 2 inches by 2 inches (51 mm by 51 mm).~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	SECTION R505 COLD-FORMED STEEL FLOOR FRAMING.	
	R505.2 Structural framing. Load-bearing cold-formed steel floor framing members shall be in accordance with this section. ~~comply with Figure R505.2(l) and with the dimensional and minimum thickness requirements specified in Tables R505.2(1) and R505.2(2). Tracks shall comply with Figure R505.2(2) and shall have a minimum flange width of 1 1/4inches (32 mm).~~	
	R505.2.1Material. Load-bearing cold-formed steel framing members shall be cold formed to shape from structural quality sheet steel complying with the requirements of ~~one of the following: 1. ASTM A 653: Grades 33 and 50 (Class 1 and 3). 2. ASTM A 792: Grades 33 and 50A. 3.~~ ASTM A 1003: Structural Grades 33 Type Hand Type H.	
	R505.2.3 Dimension, thickness and material grade. New section inserted.	
	TABLE R505.2.3 COLD-FORMED STEEL JOIST SIZES AND THICKNESSES. New section**.**	
	R505.2.4 Fastening requirements. Screws for steel-to steel connections shall be installed with a minimum edge distance and center-to-center spacing of '/2 inch (12.7 mm), shall be self-drilling tapping,	

AMENDED IRC-2012	IRC-2015	IRC-2018
	and shall conform to ASTM C 1513. Floor sheathing shall be attached to cold formed steel joists with minimum No. 8 self-drilling tap¬ ping screws that conform to ASTM C 1513. Screws attaching floor-sheathing to cold-formed steel joists shall have a minimum head diameter of 0.292 inch (7.4 mm) with countersunk heads and shall be installed with a mini¬ mum edge distance of 3/8 inch (9.5 mm). Gypsum board ceilings shall be attached to cold-formed steel joists with minimum No. 6 screws conforming to ASTM C 954 or ASTM C 1513 with a bugle head style and shall be Installed in accordance with Section R702. For all connections, screws shall extend through the steel a minimum of three exposed threads. All fasteners shall have rust inhibitive coating suitable for the installation in which they are being used, or be manufactured from material not susceptible to corrosion. ~~Where No. 8 screws are specified in a steel-to-steel connection, the required number of screws in the connection is permitted to be reduced in accordance with the reduction factors in Table R505.2.4 when larger screws are used or when one of the sheets of steel being connected is thicker~~	

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	~~than 33 mils (0.84 mm). When applying the reduction factor, the resulting number of screws shall be rounded up.~~	
	FIGURE R505.2.6.3 FLOOR JOIST WEB HOLE PATCH. New figure.	
	TABLE R505.3.2 ALLOWABLE DPANS FOR COLD-FORMED STEEL JOISTS- SINGLE OR CONINTUOUS SPANS. New table.	
	R505.3.4 Bearing stiffeners. Bearing stiffeners shall be installed at each joist bearing location in accordance with this section, except for joists lapped over an interior sup¬ port not carrying a load-bearing wall above. Floor joists supporting jamb studs with multiple members shall have two bearing stiffeners in accordance with Figure R505.3.4(1). Bearing stiffeners shall be fabricated from a C-shaped, track or clip angle member in accordance with the one of following: 1. C-shaped bearing stiffeners: 1.1. Where the joist is not carrying a load-bearing wall above, the bearing stiffener shall be a minimum 33 mil (0.84 mm) thickness. 1.2. Where the joist is carrying a load-bearing wall above, the bearing stiffener shall be at least the same designation thickness as the wall stud above. 2. Track bearing stiffeners:	

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	2.1. Where the joist is not carrying a load-bearing wall above, the bearing stiffener shall be a minimum 43 mil (1.09 mm) thickness. 2.2. Where the joist is carrying a load-bearing wall above, the bearing stiffener shall be at least one designation thickness greater than the wall stud above. ~~3. Clip angle bearing stiffeners: Where the clip angle bearing stiffener is fastened to both the web of the member it is stiffening and an adjacent rim track using the fastener pattern shown in Figure R505.3.4(2), the bearing stiffener shall be a mini- mum 2 inch by 2inch (51 mm by 51 mm) angle sized in accordance with Tables R505.3.4(l), R505.3.4(2), R505.3.4(3), and R505.3.4(4).~~ The minimum length of a bearing stiffener shall be the depth of member being stiffened minus 3/8 inch (9.5 mm). Each bearing stiffener shall be fastened to the web of the member it is stiffening as shown in Figure R505.3.4(2). ~~Each clip angle bearing stiffener shall also be fastened to the web of the adjacent rim track using the fastener pattern shown in Figure R505.3.4(2). No. 8 screws shall be used for C-shaped and track members of~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~any thickness and for clip angle members with a designation thickness less than or equal to 54. No. 10 screws shall be used for clip angle members with a designation thickness greater than 54.~~	
	SECTION R507 <u>EXTERIOR</u> DECKS	
	R507.2 Deck ledger connection to band joist. <u>Deck ledger connections to band joists shall be in accordance with this section, Tables R507.2 and R507.2.1, and Figures R507.2.1(1) and R507.2.1(2). For other grades species, connection details and loading conditions, deck ledger connections be designed in accordance with Section R301.</u> ~~For decks supporting a total design load of 50 pounds per square foot (2394 Pa) [40pounds per square foot (1915 Pa) live load plus 10pounds per square foot (479 Pa) dead load], the connection between a deck ledger of pressure-preservative-treated Southern Pine, incised pressure-preservative-treated Hem-Fir or approved decay-resistant species, and a 2-inch (51 mm) nominal lumber band joist bearing on a sill plate or wall plate shall be constructed with '/9-inch (12.7 mm) lag screws or bolts with washers in accordance with Table R507.2. Lag screws, bolts and washers~~	**<u>507.2 Materials.</u>** <u>New section and subsections.</u>

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~shall be hot-dipped galvanized or stainless steel.~~	
	R507.2.1 Ledger details. New section.	
	R507.2.2 Band joist details. New section.	
	R507.2.3 Ledger to band joist fastener connection. New section.	**R507.2.3 Fasteners and connectors.** New section.
	R507.2.4 ~~R507.2.3~~ Deck lateral load connection. The lateral load connection required by Section R507.1 shall be permitted to be in accordance with Figure R507.2.3(1) or R507.2.3(2). Where the lateral load connection is provided in accordance with Figure 507.2.3(1), hold-down tension devices shall be installed in not less than two locations per deck, within 24 inches of each end of the deck. ~~and~~ Each device shall have an allowable stress design capacity of not less than 1,500pounds (6672 N). Where the lateral load connections are provided in accordance with Figure R507.2.3(2), the hold-down tension devices shall be installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).	**R507.2.4 Flashing.** New section
		R507.2.5 Alternate materials. New section.
	R507.3 Plastic composite deck boards, stair treads, guards, or handrails. New section and subsections.	

AMENDED IRC-2012	IRC-2015	IRC-2018
		R507.3. Footings ~~Decks~~. New section.
		R507.3.1 Minimum size ~~Labeling~~. New section**.**
	TABLE R507.2. Revised**.**	**R507.3.2 Minimum depth ~~Flame spread index.~~** New section.
		R507.4.1 ~~R507.8.1~~ Deck post to deck footing connection. Where posts ~~shall~~ bear on concrete footings in accordance with Section R403 and Figure 507.8.1, lateral restraint shall be provided by manufactured connectors or a minimum post embedment of 12 inches (305 mm) in surrounding soils or concrete piers. Other footing systems shall be permitted. ~~Posts shall be restrained to prevent lateral displacement at the bottom support. Such lateral restraint shall be provided by manufacturer connectors installed in accordance with Section R507 and the manufacturer's instructions or a minimum post embedment of 12 inches (305 mm) in surrounding soils and concrete piers.~~ **Exception:** Where expansive/, compressible, shifting or other questionable soils are present, surrounding soils shall not be relied on for lateral support.
		TABLE R507.3.1 MINIMUM FOOTIGN SIZE FOR DECKS. New table.
	FIGURE R507.2.3(2) DECK ATTACHMENT FOR LATERAL LOADS. New figure**.**	
	TABLE R507.4 MAXIMUM JOIST SPACING. New table**.**	
	TABLE R507.5 DECK JOIST SPANS FOR COMMON LUMBER SPECIES. New table**.**	

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	FIGURE R507.5 TYPICAL DECK JOIST SPANS. New figure**.**	
	R507.4 Decking. New section**.**	
	R507.5 Deck joists. New section and subsections**.**	
	TABLE R507.6 DECK BEAM SPAN LENGTHS. New table.	
	R507.6 Deck beams. New section**.**	
	R507.7 Deck joists and deck beam bearing. New section and subsections.	**R507.6.1 ~~R507.7~~ Deck joists ~~and deck beam~~ bearing.** The ends of each joist and beam shall have not less than 1 ½ inches (38 mm) of bearing on wood or metal and not less than 3 inches (76 mm) on concrete or masonry for the entire width, Joists bearing on top of a multiple-ply beam or ledger shall be fastened in accordance with Table R602.3(1). Joists bearing on top of a single-ply beam or ledger shall be attached by a mechanical connector. Joist framing into the side of a beam or ledger board shall be supported by approved joist hangers. ~~of the beam. Joist framing into the side of a ledger board or beam shall be supported by approved joist hangers. Joist bearing on a beam shall be connected to the beam to resist lateral displacement.~~
		R507.7 ~~R507.4~~ Decking. Maximum allowable spacing for joist supporting decking shall be in accordance with Table R507.7 ~~R507.4~~. Wood decking shall be attached to each supporting member with not less than (2) 8d threaded nails or (2) N0. 8 wood screws. Other approved decking or fastener systems shall be

AMENDED IRC-2012	IRC-2015	IRC-2018
		installed in accordance with the manufacturer's installation requirements.
		R507.8 Vertical and lateral supports. New section**.**
		R507.9 Vertical and lateral support. New sections and subsections.
	CHAPTER 6 WALL CONSTRUCTION	
	R602.1 General ~~Identification~~. Wood and wood-based products used for load-supporting purposes shall conform to the applicable provisions of this section. ~~Load-bearing dimension lumber for studs, plates and headers shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certification of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted.~~	
	R602.1.1 Sawn lumber. New section inserted**.**	
	R602.1.4 ~~R602.1.3~~ Structural log members. Structural log members shall comply with the provisions of ICC 400. ~~Stress grading of structural log members of nonrectangular shape, as typi - cally used in log buildings, shall be in accordance with ASTM D 3957. Such~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~structural logmembers shall be iden-tified by the grade mark of an approvedlumber grading or inspection agency. Inlieuof a grade mark on the material, a certificate of inspection as to species and grade, issued by a lumber-grading or inspection agency meeting the requirements of this section, shall be permitted to be accepted.~~	
	R602.1.6 Cross-laminated timber. New section.	
	R602.1.7 Engineered wood rim board. New section.	
	R602.1.8 Wood structural panels. New section.	
	R602.1.9 Particleboard. New section.	
	R602.1.10 Fiberboard. New section.	
		R602.1.11 Structural insulated panels. New section.
	R602.3 Design and construction. Exterior walls of wood frame construction shall be designed and constructed in accordance with the provisions of this chapter and Figures R602.3(l) and R602.3(2) or in accordance with AWC ~~AF&PA's~~ NDS. Components of exterior walls shall be fastened in accordance with Tables R602.3(l) through R602.3(4). Wall sheathing shall be fastened directly to framing members and, when placed on the exterior side of an exterior wall, shall	

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	be capable of resisting the wind pressures listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) and shall conform to the requirements of Table R602.3(3). ~~Wood structural panel sheathing used for exterior walls shall conform to DOC PS 1, DOC PS 2 or, when manufactured in Canada, CSA 0437 or CSA 0325. All panels shall be identified for grade, bond classification, and Performance Category by a grade mark or certificate of inspection issued by an approved agency and shall conform to the requirements of Table R602.3(3).~~ Wall sheathing used only for exterior wall covering purposes shall comply with Section R703. Studs shall be continuous from support at the sole plate to a support at the top plate to resist loads perpendicular to the wall. The support shall be a foundation or floor, ceiling or roof diaphragm or shall be designed in accordance with accepted engineering practice. Exception: Jack studs, trimmer studs and cripple studs at openings in walls that comply with Tables R502.5(l) and R502.5(2).	
	TABLE R602.3(1). Revised**.**	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R602.3.1 Stud size, height and spacing. The size, height and spacing of studs shall be in accordance with Table R602.3.(5). **Exceptions:** Revise 2. Where snow loads are less than or equal to 25 pounds per square foot (1.2 kPa), and the ultimate design wind speed is less than or equal to 130 mph (58.1 m/s), 2 inch by 6 inch (38 mm by 14 mm) studs supporting a roof load with not more than 6 feet (1829 mm) of tributary length shall have a maximum height of 18 feet (406 mm) on center, or 20 feet (6096 mm) where spaced at 12 inches (304.8 mm) on center. Studs shall be minimum No. 2 grade lumber. ~~Studs more than 10 feet (3048 mm) in height which are in accordance with Table R602.3.1.~~	**R602.3.1 Stud size, height and spacing.** **Exception**: Add- 3. Exterior load-bearing studs not exceeding 12 feet (3658 mm) in height provided in accordance with Table R602.3(6). The minimum number of full-height studs adjacent to openings shall be in accordance with Section R602.7.5. The building shall be located in Exposure B, the roof live load shall not exceed 20 psf (0.96 kPa), and the ground now load shall not exceed 30 psf (1.4 kPa). Studs and plates shall be No. 2 grade lumber or better.
	R602.3.2 Top plate. Wood stud walls shall be capped with a double top plate installed to provide overlapping at corners and intersections with bearing partitions. End joints in top plates shall be offset at least 24 inches (610 mm). Joints in plates need not occur over studs. Plates shall be not less than 2-inches (51mm) nominal thickness and have a width at least equal to the width of the studs.	

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	Exception: Revise-A single top plate used as an alternative to a double top plate shall comply with the following: 1. The single top plate shall be tied at corners, intersecting walls, and at in-line splices in straight wall lines in accordance with Table R602.3.2. 2. The rafters or joists shall be centered over the studs with a tolerance of not more than 1 inch (25 mm). 3. Omission of the top plate is permitted over headers where the headers are adequately tied to adjacent wall sections in accordance with Table R%602.3.2. ~~may be installed in stud walls, provided the plate is adequately tied at joints, corners and intersecting walls by a minimum3-inch by 6-inch by a 0.036-inch-thick (76 mm by 152 mm by 0.914 mm) galvanized steel plate that is nailed to each wall or segment of wall by six 8d nails on each side, provided the rafters or joists are centered over the studs with a tolerance of no more than 1 inch (25 mm). The top plate may be omitted over lintels that are adequately tied to adjacent wall sections with steel plates or equivalent as previously described.~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
		TABLE R602.3(6) ALTERNATE WOOD BEARING WALL STUD SIZE, HEIGHT AND SPACING. New table.
	TABLE R602.3.2 SINGLE TOP-PLATE SPLICE CONNECTION DETAILS. New table.	
	R602.7.1 Single member headers. Single headers shall be framed with a single flat 2-inch-nominal (51 mm) member or wall plate not less in width than the wall studs on the top and bottom of the header in accordance with Figures R602.7.1(l) andR602.7.1(2) and face nailed to the top and bottom of the header with 10d box nails (3 inches x 0.128 inches) spaced 12 inches on center.	
	R602.7.2 Rim board headers. New section inserted.	
	TABLE R602.7(1) GIRDER SPANS AND HEADER SPANS FOR EXTERIOR BEARING WALLS. New table.	**TABLE R602.7(1) GIRDER SPANS AND HEADER SPANS FOR EXTERIOR BEARING WALLS.** Revised.
	TABLE R602.7(2) GIRDER SPANS AND HEADER SPANS FOR INTERIOR BEARING WALLS. New table.	
	TABLE R602.7(1) GIRDER SPANS AND HEADER SPANS FOR OPEN PORCHES. New table.	
	FIGURE R602.7.1(1) SINGLE MEMBER HEADER IN EXTERIOR BEARING WALL. Revised figure.	

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	FIGURE R602.7.1(2) ALTERNATIVE SINGLE MEMBER HEADER WITHOUT CRIPPLE. Revised figure.	
	FIGURE R602.7.2 RIM BOARD EHADER CONSTRUCTION Revised figure.	
	R602.7.5 Supports for headers. New section.	
	R602.10.2.2.1 Location of braced wall panels in Seismic Design Categories D_0, D_1, and D_2. Braced wall panels shall be located at each end of a braced wall line. **Exception:** Braced wall panels constructed of Methods WSP or BV-WSP and continuous sheathing methods as specified in Section R602.10.4 shall be permitted to begin no more than 10 feet (3048 mm) from each end of a braced wall line provided each end complies with one of the following. 1. A minimum 24-inch-wide (610 mm) panel for Methods WSP, ~~BV-WSP,~~ CS-WSP, CS-G, and CS-PF~~, and 32-inch-wide (813 mm) panel for Method CS-SFB~~ is applied to each side of the building corner as shown in End Condition 4 ~~Condition 4~~ of Figure R602.10.7. 2. The end of each braced wall panel closest to the end of the braced wall line shall have an 1,800 lb (8 kN) hold-down device fastened to the stud at the edge of	

AMENDED IRC-2012	IRC-2015	IRC-2018
	the braced wall panel closest to the corner and to the foundation or framing below as shown in Condition5 of Figure R602.10.7. 3. ~~For Method BV-WSP, hold-down devices shall be provided in accordance with Table R602.10.6.5 at the ends of each braced wall panel.~~	
	R602.10.4.1 Mixing methods. Mixing of bracing methods shall be permitted as follows: 1. Mixing intermittent bracing and continuous sheathing methods from story to story shall be permitted. 2. Mixing intermittent bracing methods from braced wall line to braced wall line within a story shall be permitted. Within Seismic Design Categories A, B and C or in regions where the basic wind speed is less than or equal to 130 ~~100~~ mph (58 ~~45~~ m/s), mixing of intermittent bracing and continuous sheathing methods from braced wall line to braced wall line within a story shall be permitted. 3. Mixing intermittent bracing methods along a braced wall line shall be permitted in Seismic Design Categories A and B, and detached dwellings in Seismic Design Category C provided the length of required bracing in accordance with Table R602.10.3(1) or R602.10.3(3) is the highest	**R602.10.4.1 Mixing methods.** Revise 4. Mixing of continuous sheathing methods CSWSP, CS-G and CS-PF along a braced wall line shall be permitted. Intermediate methods ABW, PFH, and {FG shall be permitted to be used along a braced wall line with continuous sheathed methods, provided that the length of the required bracing for that braced wall line is determined in compliance with Table R602.10.3(1)nor R602.10.3(3) suing the highest value of the bracing method used..

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	value of all intermittent bracing methods used. 4. Mixing of continuous sheathing methods CSWSP, CS-G and CS-PF along a braced wall line shall be permitted. Intermediate methods ABW, PFH, and {FG shall be permitted to be used along a braced wall line with continuous sheathed methods. 5. In Seismic Design Categories A and B, and for detached one- and two-family dwellings in Seismic Design Category C, mixing of intermittent bracing methods along the interior portion of a braced wall line with continuous sheathing methods CS-WSP, CS-G and CS-PF along the exterior portion of the same braced wall line shall be per¬ mitted. The length of required bracing shall be the highest value of all intermittent bracing methods used in accordance with Table R602.10.3(1) or R602.10.3(3) as adjusted by Tables R602.10.3(2) and R602.10.3(4), respectively. The requirements of Section R602.10.7 shall apply to each end of the continuously sheathed portion of the braced wall line.	
		R602.10.4.4 Panel joints. New section**.**
	TABLE R602.10.3(1). Revised.	
	TABLE R602.10.3(2). Revised.	

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	TABLE R602.10.3(3). Revised.	
	TABLE R602.10.3(4). Revised.	
		TABLE R602.10.5 MINIMUM LENGTH OF BRACED WALL PANELS. Revised.
	R602.10.6.5.1 Length of bracing. New section.	
	TABLE R602.10.4. Revised.	
	R602.10.8.2 Connections to roof framing. Top plates of exterior braced wall panels shall be attached to rafters or roof trusses above in accordance with Table R602.3(l) and this section. Where required by this section, blocking between rafters or roof trusses shall be attached to top plates of braced wall panels and to rafters and roof trusses in accordance with Table R602.3(l). A continuous band, rim, or header joist or roof truss parallel to the braced wall panels shall be permitted to replace the blocking required by this section. Blocking shall not be required over openings in continuously sheathed braced wall lines. In addition to the requirements of this section, lateral support shall be provided for rafters and ceiling joists in accordance with Section R802.8 and for trusses in accordance with Section R802.10.3. Roof ventilation shall be provided in accordance with SectionR806.1.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	1. For Seismic Design Categories A, B and C ~~and wind speeds less than 100 mph (45 m/s)~~ where the distance from the top of the braced wall panel to the top of the rafters or roof trusses above is 9V4 inches (235 mm) or less, blocking between rafters or roof trusses shall not be required. Where the distance from the top of the braced wall panel to the top of the rafters or roof trusses above is between 9'/4 inches (235 mm) and 15'/4 inches (387 mm), blocking between rafters or roof trusses shall be provided above the braced wall panel in accordance with Figure R602.10.8.2(1). **Exception:** Where the outside edge of the truss vertical web members aligns with the outside face of the wall studs below, wood structural panel sheathing extending above the top plate as shown in Figure R602.10.8.2(3) shall be permitted to be fastened at each truss web with three 8d nails 2(2 ½ inches x 0.131 inch) and blocking between the trusses shall not be required. 2. For Seismic Design Categories D_0, D_1, and D_2 ~~or wind speeds of 100 mph (45~~	

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	~~m/s) or greater,~~ where the distance from the top of the braced wall panel to the top of the rafters or roof trusses is 15'/4 inches (387 mm) or less, blocking between rafters or roof trusses shall be provided above the braced wall panel in accordance with Figure R602.10.8.2(l). 3. Where the distance from the top of the braced wall panel to the top of rafters or roof trusses exceeds 15'/4 inches (387 mm), the top plates of the braced wall panel shall be connected to perpendicular rafters or roof trusses above in accordance with one or more of the following methods: 3.1. Soffit blocking panels constructed in accordance with FigureR602.10.8.2(2); 3.2. Vertical blocking panels constructed in accordance with Figure R602.10.8.2(3); 3.3. Blocking panels provided by the roof truss manufacturer and designed in accordance with Section R802. ~~Full-height engineered blocking panels designed in accordance with the AF&PA WFCM; or~~ 3.4. Blocking, blocking panels, or other methods of lateral load transfer designed in accordance with the AWC WFCM or accepted engineering practice.	
		R602.10.6.5 Wall bracing for dwellings with stone and masonry veneer in Seismic Design Categories

AMENDED IRC-2012	IRC-2015	IRC-2018
		D_0, D_1 and D_2. Where stone and masonry veneer are installed in accordance with Section R703.8, wall bracing in the exterior braced wall lines and braced wall lines on the interior of the building, backing or perpendicular to and laterally supporting veneered walls shall comply with this section. Where dwellings in Seismic Design Categories D_0, D_1 and D_2 have stone or masonry veneer installed in accordance with Section R703.8, and the veneer does not exceed the first story height, wall bracing shall be in accordance with Section R602.10.3. Where detached one- or two-family dwellings in Seismic Design Categories D_0, D_1 and D_2 have exterior ~~stone or masonry~~ veneer installed in accordance with Section R703.8, and are braced in accordance with Method WSP or CS-WSP, veneer shall be permitted in the second story in accordance with Item 1 or 2, provided that the dwelling does not extend more than two stories above grade plane, the veneer does not extend 5 inches (127 mm) in thickness, the height of veneer on gable-end walls does not extend more than 8 feet (2438 mm) above the bearing wall top plate elevation, and the total length of braced wall panel specified by Table R602.10.3(3) is multiplied by 1.2 for each first- and second-story braced wall line. 1. The total area of the veneer on the second-story exterior walls shall be permitted to extend up to 25 percent of the occupied second floor area.

AMENDED IRC-2012	IRC-2015	IRC-2018
		2. The veneer on the second-story exterior walls shall be permitted to cover one side of the dwelling, including walls on bay windows and similar appurtenances within the one dwelling side. ~~the veneer exceeds the first-story height, with bracing at exterior braced wall lines and braced wall lines on the interior of the building shall be constructed using Method BV-WSP in accordance with this section and Figure R602.10.6.5. Cripple walls shall not be permitted, and required interior braced wall lines shall be supported on continuous foundations.~~ Townhouses in Seismic Design Categories D_0, D_1 and D_2 with stone or masonry veneer exceeding the first-story height shall be designed in accordance with accepted engineering practice.
	R602.10.11. Cripple wall bracing. Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3), and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4), respectively, except that the length of cripple wall bracing shall be multiplied by a factor of 1.15. Where gypsum wall board is not used on the	

AMENDED IRC-2012	IRC-2015	IRC-2018
	inside of the cripple wall bracing, the length adjustments for the elimination of the gypsum wallboard, or equivalent, shall be applied as directed in Tables R602.10.3(2) and R602.10.3(4) to the length of the cripple wall bracing required. This adjustment shall be taken in addition to the 1:15 increase. ~~The distance between adjacent edges of braced wall panels shall be reduced from 20 feet (6096 mm) to 14feet (4267 mm).~~	
	R602.12 Simplified wall design: Revised- 6. The structure shall be located where the ultimate ~~basic~~ wind speed is less than or equal to 130 ~~90~~ mph (58 ~~40~~ m/s), and the Exposure Category is B or C ~~A or B~~. Revised- 8. Cripple walls shall not be permitted in three-story ~~two-story~~ buildings.	
	R602.12.6.2 Method CSPF. Braced wall panels constructed as Method CS-PF in accordance with Section R602.10.6.4 shall be permitted when all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-PF panel shall equal 0.75 ~~0.5~~ bracing units. Not more than ~~A maximum of~~ four CS-PF panels shall be permitted on all segments of walls parallel to each side of the circumscribed	

AMENDED IRC-2012	IRC-2015	IRC-2018
	rectangle. Segments of wall that ~~which~~ include a Method CS-PF panel shall meet the requirements of Section R602.10.4.2.	
	R602.12.6.3 Methods ABW, PFH and PFG. Braced wall panels constructed as Method ABW, PFH and PFG shall be permitted when bracing units are constructed using wood structural panels. Each ABW and PFH panel shall equal one bracing unit and each PFG panel shall be equal to 0.75 bracing units.	
	TABLE R602.12.4. Revised.	
	SECTION R602 COLD-FORMED STEEL WALL FRAMING	
	R603.1.1 Applicability limits. The provisions of this section shall control the construction of exterior cold-formed steel wall framing and interior load-bearing cold-formed steel wall framing for buildings not more than 60 feet (18 288 mm) long perpendicular to the joist or truss span, not more than 40 feet (12 192mm) wide parallel to the joist or truss span, and less than or equal to three stories above grade plane. ~~All~~ Exterior walls installed in accordance with the provisions of this section shall be considered as load-bearing walls. Cold-formed steel walls constructed in accordance with the provisions of this	**R603.1.1 Applicability limits**. The provisions of this section shall control the construction of exterior cold-formed steel wall framing and interior load-bearing cold-formed steel wall framing for buildings not more than 60 feet (18 288 mm) long perpendicular to the joist or truss span, not more than 40 feet (12 192mm) wide parallel to the joist or truss span, and less than or equal to three stories above grade plane. Exterior walls installed in accordance with the provisions of this section shall be considered as load-bearing walls. Cold-formed steel walls constructed in accordance with the provisions of this section shall be limited to sites subjected to an ultimate design wind speed of 140 ~~139~~ miles per hour (62 m/s) Exposure B or C and a

AMENDED IRC-2012	IRC-2015	IRC-2018
	section shall be limited to sites subjected to a ultimate ~~maximum~~ design wind speed of 139 ~~m~~iles per hour (62 ~~49~~ m/s) Exposure B or C and a maximum ground snow load is less than or equal to ~~of~~ 70 pounds per square foot (3.35 kPa).	maximum ground snow load is less than or equal to 70 pounds per square foot (3.35 kPa).
	R603.2 Structural framing. Load-bearing cold-framed steel wall framing members shall be in accordance with this section. ~~Load-bearing cold-formed steel wall framing members shall comply with Figure R603.2(l) and with the dimensional and minimum thickness requirements specified in Tables R603.2(l) and R603.2(2). Tracks shall comply with Figure R603.2(2) and shall have a minimum flange width of 1'/4 inches (32 mm).~~	
	R603.2.1 Material. Load-bearing cold-formed steel framing members shall be cold-formed to shape from structural quality sheet steel complying with the requirements of ASTM A 1003: Structural Grades 33 Type H and 50 Type H. ~~one of the following:~~ ~~1. ASTM A 653: Grades 33 and 50 (Class 1and 3).~~ ~~2. ASTM A 792: Grades 33 and 50A.~~ ~~3. ASTM A 1003: Structural Grades 33 Type H, and 50 Type H.~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R603.2.3 Dimension, thickness and material grade. New section inserted.	
	R603.3.2- Minimum stud sizes. Cold-formed steel walls shall be constructed in accordance with Figure R603.3.1(l), R603.3.1(2) or R603.3.1(3), as applicable. Exterior wall stud size and thickness shall be determined in accordance with the limits set forth in Tables R603.3.2(2) through R603.3.2(16 ~~31~~). Interior load-bearing wall stud size and thickness shall be determined in accordance with the limits set forth in Tables R603.3.2(2) through R603.3.2(16 ~~31~~) based upon an ultimate design wind speed of 115 ~~85~~ miles per hour (51 ~~38~~ m/s) Exposure Category B ~~A/B wind value~~ and the building width, stud spacing and snow load, as appropriate. Fastening requirements shall be in accordance with Section R603.2.5 ~~R603.2.4~~ and Table R603.3.2(l). Top and bottom tracks shall have the same minimum thickness as the wall studs. Exterior wall studs shall be permitted to be reduced to the next thinner size, as shown in Tables R603.3.2(2) through R603.3.2(16 ~~31~~), but not less than 33 mils (0.84 mm), where both of the following conditions exist:	

AMENDED IRC-2012	IRC-2015	IRC-2018
	1. Minimum of ½- inch (12.7 mm) gypsum board is installed and fastened in accordance with Section R702 on the interior surface. 2. Wood structural sheathing panels of minimum 7/16inch-thick (11 mm) oriented strand board or l5/32inch-thick (12 mm) plywood is installed and fastened in accordance with Section R603.9.1 and Table R603.3.2(l) on the outside surface. Interior load-bearing walls shall be permitted to be reduced to the next thinner size, as shown in Tables R603.3.2(2) through R603.3.2(16 ~~3l~~), but not less than 33 mils (0.84 mm), where a minimum of 1/2-inch (12.7 mm) gypsum board is installed and fastened in accordance with Section R702 on both sides of the wall. The tabulated stud thickness for load- bearing walls shall be used when the attic load is 10 pounds per square feet (480 Pa) or less. A limited attic storage load of 20 pounds per square feet (960 Pa) shall be permitted provided that the next higher snow load column is used to select the stud size from Tables R603.3.2(2) through R603.3.2(16 ~~31~~). For two-story buildings, the tabulated stud thickness for walls supporting one floor, roof and ceiling shall be used when	

AMENDED IRC-2012	IRC-2015	IRC-2018
	second floor live load is 30 pounds per square feet (1440 Pa). Second floor live loads of 40 psf (1920 pounds per square feet) shall be permitted provided that the next higher snow load column is used to select the stud size from Tables R603.3.2(2) through R603.3.2(11 ~~21~~). For three-story buildings, the tabulated stud thick¬ ness for walls supporting one or two floors, roof and ceiling shall be used when the third floor live load is 30 pounds per square feet (1440 Pa). Third floor live loads of 40 pounds per square feet (1920 Pa) shall be permit¬ ted provided that the next higher snow load column is used to select the stud size from Tables R603.3.2(22) through R603.3.2(16 ~~31~~).	
	TABLE R603.3.1. Revised.	**TABLE R603.3.1 WALL TO FOUNDATION CONENCTION REQUIREMENTS.** Revised.
	TABLE R603.3.1(1). Revised.	**TABLE R603.3.1(1) GABLE ENDWALL TO FLOOR CONNECTION REQUIREMENTS.** Revised.
	TABLE R603.3.1(2). Revised.	**TABLE R603.3.1(2) GABEL ENDWALL BOTTOM TRACK TO FOUNDATION CONNECTION REQUIREMENTS.** Revised.
	TABLE R603.3.2(2). Revised.	**TABLE R603.3.2(2) 24-FOOT-WIDE BUILDING SUPPORTING ROOF AND VEILING ONLY.** Revised.
	TABLE R603.3.2(3). Revised.	**TABLE R603.3.2(3) 24-FOOT-WIDE BUILDING SUPORTING ROOF AND CEILING ONLY.** Revised.

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R603.3.2(4). Revised.	**TABLE R603.3.2(4) 24-FOOT-WIDE BUILDING SUPPORTING TOOF AND CEILING ONLY.** Revised.
	TABLE R603.3.2(5). Revised.	**TABLE R603.3.2(5) 35-FOOT-WAIDE BUILDING SUPPRTING ROOF AND CEILING ONLY.** Revised.
	TABLE R603.3.2(6). Revised.	**TABLE R603.3.2(6) 40-FOOT-WIDE BUILDING SUPPORTING ROOF AND C EILING ONLY.** Revised.
	TABLE R603.3.2(7). Revised.	**TABLE R603.3.2(7) 24-FOOT-WIDE BUILDING SUPPORTING ONE FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(8). Revised.	**TABLE R603.3.2(8) 28-FOOT-WIDE BUILDING SUIPPORTING ONE FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(9). Revised.	**TABLE R603.3.2 32-FOOT-WIDE BJUILDING SUIPPORTING ONE FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(10). Revised.	**TABLE R603.3.2(10) 36-FOOT-WIDE SUPPORTING ONE FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(11). Revised.	**TABLE R603.3.2(11) 40-FOOT-WIDE BUILDING SUPPORTING ONE FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(12). Revised.	**TABLE R603.3.2(12) 24-FOOT WIDE BUILDING SUPPORTING TWO FLOORS, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(13). Revised.	**TABLE R603.3.2(13) 28-FOOT-WIDE BIULDING SUPPORTING TWO FLOORS, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(14) Revised.	**TABLE R603.3.2(14) 32-FOOT-WIDE BUILDING SUPPORTING TWO FLOORS, ROOF AND CEILING** Revised.

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R603.3.2(15). Revised.	**TABLE R603.3.2(15) 36-FOOT-WIDE BUILDING SUPPORTING TWO FLOOR, ROOF AND CEILING.** Revised.
	TABLE R603.3.2(16). Revised.	**TABLE R603.3.2(16) 40-FOOT-WIDE BUILDING SUPPORTING TWO FLOORS, ROOF AND CEILING.** Revised.
	TABLE R603.3.2.1(1). Revised.	**TABLE R603.3.2.1(1) ALL BUILDING WIDTHS GABLE ENDWALLS 8,9 OR 10 FEET IN HEIGHT.** Revised.
	TABLE R603.3.2.1(2). Revised.	**TABLE R603.3.2.1(2) ALL BUILDING WIDTHS GABLE ENDWALLS OVER 10 FEET IN HEIGHT.** Revised.
	TABLE R603.6(1). Revised.	
	TABLE R603.6(2). Revised.	
	TABLE R603.6(3). Revised.	
	TABLE R603.6(4). Revised.	
	TABLE R603.6(5). Revised.	
	TABLE R603.6(6). Revised.	
		R603.2.5 Splicing. Steel studs and other structural members shall not be spliced without an approved design. Tracks shall be spliced in accordance with Figure R603.3.5.
		TABLE R603.7(2) HEADER TO KING STUD CONNECTION REQUIREMENTS. Revised.
		TABLE R603.8 HEAD AND SILL TRACK SPAN. Revised.
	R603.9.2 Determination of minimum length of full-height sheathing. **Exception:** Where stone or masonry veneer is installed, the required length of full-height sheathing and overturning anchorage required shall be determined in accordance with Section R603.9.5.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R603.8. Revised.	
	R603.9.4.1 Wind speeds greater than 126 ~~100~~ mph. Where wind speeds are in excess of 126 ~~100~~ miles per hour (56 ~~45~~ m/s), Exposure Category C, walls shall be provided wind direct uplift connections in accordance with AISI S230, Section E13.3, and AISI S230, Section F7.2, as required for 139 ~~110~~ miles per hour (56 ~~49~~ m/s), Exposure Category C.	**R603.9.4.1 Wind speeds greater than 126 mph**. Where wind speeds are in excess of 130 ~~126~~ miles per hour (58 ~~56~~ m/s), Exposure Category C, walls shall be provided wind direct uplift connections in accordance with AISI S230, Section E13.3, and AISI S230, Section F7.2, as required for 140 ~~139~~ miles per hour (63 ~~56~~ m/s), Exposure Category C.
		TABLE R603.9.2(1) MINIMUM PERCENTAGE OF FULL-HEIGHT STRUCTURAL SHEATHING ON EXTERIOR WALLS. Revised.
	R603.9.5 Structural sheathing for stone and masonry veneer. ~~In Seismic Design Category C,~~ Where stone and masonry veneer is installed in accordance with Section R703.8 ~~R703.7~~, the length of structural sheathing for exterior and interior wall lines backing or perpendicular to and laterally supported with veneer shall comply with this section. ~~Walls supporting one story, roof and ceiling shall be the greater of the amount required by Section R603.9.2 or 36 percent, modified by Section R603.9.2 except Section R603.9.2.2 shall not be permitted.~~	
	R603.9.5.1 Seismic Design Category C. New section.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R603.9.5.1 Seismic Design Categories D_0, D_1 and D_2. New section.	
	TABLE R603.9.5(1) REQUIRED LENGTH OF FULL-HEIGHT SHEATING AND ASSOCIATED OVERTURNING ANCHORAGE FOR WALLS SUPPORTING WALLS WITH STONE OR MASONRY VENEER AND USING 33-MIL COLD-FORMED STEEL FRAMING AND 6-INCH SCREW SPACING ON THE PERIMETER OF EACH PANEL OF STRUCTURAL SHEATHING. New table.	
	TABLE R603.9.5(2) REQUIRED LENGTH OF FULL-HEIGHT SHEATING AND ASSOCIATED OVERTURNING ANCHORAGE FOR WALLS SUPPORTING WALLS WITH STONE OR MASONRY VENEER AND USING 43-MIL COLD-FORMED STEEL FRAMING AND 6-INCH SCREW SPACING ON THE PERIMETER OF EACH PANEL OF STRUCTURAL SHEATHING. New table.	
	TABLE R603.9.5(3) REQUIRED LENGTH OF FULL-HEIGHT SHEATING AND ASSOCIATED OVERTURNING ANCHORAGE FOR WALLS SUPPORTING WALLS WITH STONE OR MASONRY VENEER AND USING 33-MIL COLD-FORMED STEEL FRAMING AND 4-INCH SCREW SPACING ON THE PERIMETER OF EACH PANEL OF STRUCTURAL SHEATHING. New table.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R603.9.5(4) REQUIRED LENGTH OF FULL-HEIGHT SHEATING AND ASSOCIATED OVERTURNING ANCHORAGE FOR WALLS SUPPORTING WALLS WITH STONE OR MASONRY VENEER AND USING 43-MIL COLD-FORMED STEEL FRAMING AND 4-INCH SCREW SPACING ON THE PERIMETER OF EACH PANEL OF STRUCTURAL SHEATHING. New table.	
	R604.3 Installation. Wood structural panel wall sheathing shall be attached to framing in accordance with Table R602.3(l) or R602.3(3). ~~Wood structural panels marked Exposure 1or Exterior are considered water-repellent sheathing under the code.~~	
	R606.2 Masonry construction materials. New section and subsections inserted.	
		R606.2.3 AAC masonry. AAC masonry units shall conform to ASTM C1691 and ASTM C1693 ~~C 1386~~ for the strength class specified.
		R606.2.6 Adhered manufactured stone masonry veneer units. New section inserted.
	TABLE R606.2.7 MORTAR PROPOSTIONS. New table inserted.	
	R606.3 Construction requirements. New section and subsections inserted.	
	R606.3.4 Protection for reinforcement. New section and subsections inserted.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R606.3.4.1 MINIMUM CORROSION PROTECTION. New table inserted.	
	R606.3.5 Grouting requirements. New section and subsections inserted.	
	TABLE R606.2.11 GROUT PROPORTIONS BY VOLUME FOR MASONRY CONSTRUCTION. New table inserted.	
	TABLE R606.3.5.1 GROUT SPACE DIMENSIONS AND POUR HEIGHTS. New table inserted.	
	R606.3.6 Grouted multiple-wythe masonry. New section and subsections inserted.	
	R606.3.7 Masonry bonding pattern. New section and subsections inserted.	
	R606.6.3 Beam supports. New section inserted.	
	R606.6.3.1 Joist bearing. New section inserted.	
	R606.6.4 Lateral support. New section inserted.	
	TABLE R606.6.4 SPACING OF LATERAL SUPPORT FOR MASONRY WALLS. New table inserted.	
	R606.6.4.1 Horizontal lateral support. New section supports.	
	R606.6.4.1.1 Bonding pattern. New section inserted.	
	R606.6.4.1.2 Metal reinforcement. New section inserted.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	R606.6.4.2 Vertical lateral support. New section inserted.	
	R606.6.4.2.1 Roof structures. New section inserted**.**	
	R606.6.4.2.2 Floor diaphragm. New section inserted**.**	
	R606.9 Allowable stress. New section and subsections inserted**.**	
	TABLE R606.9 ALLOWABLE COMPRESSIVE STRESSES FOR EMPIRICAL DESIGN OF MASONRY. New table inserted**.**	
	R606.12.3 Seismic Design Category D_0 or D_1. Structures in Seismic Design Category D_0 or D_1 shall comply with the requirements of Seismic Design Category C and the additional requirements of this section. AAC masonry shall not be used for the design of masonry elements that are part of the lateral force-resisting system.	
	R606.13 Multiple-wythe masonry. New sections and subsections.	
	SECTION R607 ~~R610~~ GLASS UNIT MASONRY. Section and all subsections renumbered.	
	SECTION R608 ~~R611~~ EXTERIOR CONCRETE WALL CONSTRUCTION. Section and subsections renumbered.	
	R608.5.1.1. Cements. The following standards as referenced in Chapter 44 shall be permitted to be used.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	1. ASTM C 150 2. ASTM C 595 3. ASTM C 595 4. ASTM C 1157	
	R608.6.2 Wall reinforcement for wind. Vertical wall reinforcement for resistance to out-of-plane wind forces shall be determined from Table R608.6(1), R608.6(2), R608.6(3) or R608.6(4) ~~R611.6(1), R611.6(2), R611.6(3) or R611.6(4)~~. For the design of non-load bearing walls, in Tables R608.6(1), R608.6(2) and R608.6(3) use the appropriate column labeled "TOP". ~~Also, see Sections R611.7.2.2.2 and R611.7.2.2.3.~~ There shall be a vertical bar at all corners of exterior walls. Unless more horizontal reinforcement is required by Section R611.7.2.2.1, the minimum horizontal reinforcement shall be four No. 4 bars [Grade 40 (280 MPa)] placed as follows: top bar within 12 inches (305 mm) of the top of the wall, bottom bar within 12 inches (305 mm) of the finish floor, and one bar each at approximately one-third and two-thirds of the wall height.	
	TABLE 608.6(2) MINIMUM VERTICAL REINFORCEMENT FOR WAFFLE-GRID ABOVE-GRADE WALLS. Revised.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE 608.6(3) MINIMUM VERTICAL REINFORCEMENT FOR 6-INCH SCREEN - GRID ABOVE-GRADE WALLS. Revised.	
	TABLE 608.6(4) MINIMUM VERTICAL REINFORCEMENT FOR FLAT, WAFFLE, AND SCREEN-GRID ABOVE-GRADE WALLS DESIGNED WITH FOUNDATION STEM WALLS. Revised.	
	TABLE 608.7(1A) UNREDUCED LENGTH, UR, OF SOLID WALL REQUIRED AT EACH EXTERIOR ENDWALL FOR WIND PERPENDICULAR TO RIDGE ONE STORY OR TOP STORY OF TWO STORY. Revised.	
	TABLE 608.7(1B) UNREDUCED LENGTH, UR, OF SOLID WALL REQUIRED AT EACH EXTERIOR ENDWALL FOR WIND PERPENDICULAR TO RIDGE FIRST STORY OF TWO STORY. Revised.	
	TABLE 608.7(1C) UNREDUCED LENGTH, UR, OF SOLID WALL REQUIRED AT EACH EXTERIOR ENDWALL FOR WIND PARALLEL TO RIDGE. Revised.	
	R608.7.2.2.1 ~~R611.7.2.2.1~~ Horizontal shear reinforcement. Where reduction factors for design strength, R_{3_Rv} from Table R608.7(4) ~~R611.7(4)~~ based on horizontal and vertical shear reinforcement being provided are used, solid wall segments shall have horizontal reinforcement consisting of minimum No.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	4 bars. Horizontal shear reinforcement shall be the same grade of steel required for the vertical reinforcement at the ends of solid wall segments by Section R611.7.2.2.2. The spacing of horizontal reinforcement shall not exceed the smaller of one-half the length of the solid wall segment, minus 2 inches (51 mm), and 18 inches (457 mm). Horizontal shear reinforcement shall terminate in accordance with Section R611.6.4.	
	R611.10 Floor, roof and ceiling diaphragms. Floors and roofs in all buildings with exterior walls of concrete shall be designed and constructed as diaphragms. Where gable-end walls occur, ceilings shall also be designed and constructed as diaphragms. The design and construction of floors, roofs and ceilings of wood framing or cold-formed-steel framing serving as diaphragms shall comply with the applicable requirements of this code, or <u>AWC WFCM or AISI S230,</u> ~~AF&PA/WFCM or AISI S230,~~ if applicable. <u>Wood framing members shall be of a species having a specific gravity equal to or not greater than 0.42.</u>	
	TABLE R608.9(1) WOOD-FRAMED FLOOR TO SIDE OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R608.9(2) WOOD-FRAMED FLOOR TO SIDE OF CONCRETE WALL, FRAMING PARALLEL Revised.	
	TABLE R608.9(3) WOOD-FRAMED FLOOR TO TOP OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	
	TABLE R608.9(4) WOOD-FRAMED FLOOR TO TOP OF CONCRETE WALL, FRAMING PARALLEL. Revised.	
	TABLE R608.9(5) COLD-FORMED STEEL-FRAMED FLOOR TO SIDE OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	
	TABLE R608.9(6) COLD-FORMED STEEL-FRAMED FLOOR TO SIDE OF CONCRETE WALL, FRAMING PARALLEL. Revised.	
	TABLE R608.9(7) COLD-FORMED STEEL-FRAMED FLOOR TO TOP OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	
	TABLE R608.9(8) COLD-FORMED STEEL-FRAMED FLOOR TO TOP OF CONCRETE WALL, FRAMING PARALLEL. Revised.	
	TABLE R608.9(9) WOOD-FRAMED ROOF TO TOP OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	
	TABLE R608.9(10) WOOD-FRAMED ROOF TO TOP OF CONCRETE WALL, FRAMING PARALLEL. Revised.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	TABLE R608.9(11) WOOD-FRAMED ROOF TO TOP OF CONCRETE WALL, FRAMING PERPENDICULAR. Revised.	
	TABLE R608.9(12) COLD-FORMED STEEL-FRAMED ROOF TO TOP OF CONCRETE WALL, FRAMING PARALLEL. Revised.	
	SECTION R609 ~~R612~~ EXTERIOR WINDOWS AND DOORS. Section and subsections renumbered.	
	R609.2 ~~R612.2~~ Performance. Exterior windows and doors shall be designed to resist the design wind loads specified in Table R301.2(2) adjusted for height and exposure in accordance with Table R301.2(3) or determined in accordance with ASCE 7 using the allowable stress design load combinations of ASCE 7. Design wind loads for exterior glazing not part of a labeled assembly shall be permitted to be determined in accordance with Chapter 24 of the International Building Code.	
	R612.3 Testing and labeling. Exterior windows and sliding doors shall be tested by an approved independent laboratory, and bear a label identifying manufacturer, performance characteristics and approved inspection agency to indicate compliance with AAMA/WDMA/CSA 101/I.S.2/A440. Exterior side-hinged doors shall be tested	

AMENDED IRC-2012	IRC-2015	IRC-2018
	and labeled as conforming to AAMA/WDMA/CSA 101/I.S.2/A440 or AMD 100, or comply with Section R612.5. **Exception:** Decorative glazed openings.	
	R609.3.1 ~~R612.3.1~~ Comparative analysis. Structural wind load design pressures for window and door units different ~~smaller~~ than the size tested in accordance with Section R609.3 ~~R612.3~~ shall be permitted to be higher than the design value of the tested unit where determined in accordance with one of the following comparative analysis methods: 1. Structural wind load design pressures for window and door units smaller than the size tested in accordance with Section R609.3 shall be permitted to higher than the design value of the tested unit provided that such higher pressures are determined by accepted engineering analysis. Components of smaller units shall be the same as those of the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window or door unit having the highest allowable design pressure.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	2. In accordance with WDMA I.S.11. ~~provided such higher pressures are determined by accepted engineering analysis. All Components of the smaller unitssmall unit shall be the same as those of the tested unit. Where such calculated design pressures are used, they shall be validated by an additional test of the window or door unit having the highest allowable design pressure.~~	
	SECTION R610 ~~R613~~ STRUCTURAL INSULATED PANEL WALL CONSTRUCTION. Section and subsections renumbered.	
		R610.3 Materials. SIPs shall comply with the requirements of ANSI/APA PRS 610.1. ~~following criteria:~~ ~~1. ASTM C 578 and have a minimum density of 0.90 pounds per cubic feet (14.4 kg/m^2).~~ ~~2. Polyurethane meeting the physical properties shown in Table R610.3.1.~~ ~~3. An approved alternative.~~ ~~All cores shall meet the requirements of Section R316.~~
		R602.5.3 Panel-to-panel connection. New section inserted.
		R602.5.4 Corner bracing. New section inserted.
	R613.2 Applicability limits. The provisions of this section shall control the construction of exterior structural insulated panel walls and interior load-	

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	bearing structural insulated panel walls for buildings not greater than 60 feet (18 288 mm) in length perpendicular to the joist or truss span, not greater than 40 feet (12 192 mm) in width parallel to the joist or truss span and not greater than two stories in height with each wall not greater than 10 feet (3048 mm) high. All exterior walls installed in accordance with the provisions of this section shall be considered as load-bearing walls. Structural insulated panel walls constructed in accordance with the pro¬ visions of this section shall be limited to sites subjected to a maximum design wind speed (V_{ult}) of 155 ~~120~~ miles per hour (69 ~~54~~ m/s), Exposure ~~A or~~ B or 140 ~~110~~ miles per hour (63 ~~49~~ m/s) Exposure C, and a maximum ground snow load of 70 pounds per foot (3.35 kPa), and Seismic Design Categories A, B and C.	
	TABLE R610.5(1) ~~R613.5(1)~~ MINIMUM THICKNESS FOR SIP WALL SUPPORTING SIP OR LIGHT-FRAME ROOF ONLY (inches)3. Revised	
	TABLE R610.5(2) ~~R613.5(2)~~ MINIMUM THICKNESS FOR SIP WALLS SUPPORTING SIP OR LIGHT-FRAME ONE STORY AND ROOF (inches)3. Revised.	

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	CHAPTER 7 WALL COVERINGS	
		R702.3.1.1 Adhesives. New section.
	R702.3.7 Horizontal gypsum board diaphragm ceilings. Gypsum board and gypsum panel products ~~Use of gypsum board~~ shall be permitted on wood joists to create a horizontal diaphragm in accordance with Table R702.3.6 ~~R702.3.7~~. Gypsum board and gypsum panel products shall be installed perpendicular to ceiling framing members. End joints of adjacent courses of board shall not occur on the same joist. The maximum allowable diaphragm proportions shall be 1 ½:1 between shear resisting elements. Rotation or cantilever conditions shall not be permitted. Gypsum board shall not be used in diaphragm ceilings to resist lateral forces imposed by masonry or concrete construction. ~~All~~ Perimeter edges shall be blocked using wood members not less than 2-inch by 6-inch (51 mm by 152 mm) nominal dimension. Blocking material shall be installed flat over the top plate of the wall to provide a nailing surface not less than 2 inches (51 mm) in width for the attachment of the gypsum board or gypsum panel product.	
	R702.4.2 Backer board. ~~Fiber-cement, fiber-mat reinforced cementitious backer~~	

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	~~**units, glass mat gypsum backers and fiber-reinforced gypsum backers**~~. Materials used as backers for wall tile in tub and shower areas and wall panels in shower areas shall be of materials listed in Table R702.4.2, and shall be installed in accordance with the manufacturer's recommendations. ~~Fiber-cement, fibermat reinforced cementitious backer units, glass mat gyp- sum backers or fiber-reinforced gypsum backers in compliance with ASTM C 1288, C 1325, C 1178 or C 1278, respectively, and installed in accordance with manufacturers' recommendations shall be used as backers for wall tile in tub and shower areas and wall panels in shower areas.~~	
	TABLE R702.4.2 BACKER BOARD MATERIALS. New table inserted.	
	R703.3 Nominal thickness and attachments. New section inserted.	
	TABLE R703.3(2) SCREW FASTENER SUBSTITUTION FR SIDING ATTACHMENT TO COLD-FLORMED STEEL LIGHT FRAME CONSTRUCTION. New table inserted.	
	R703.3.1 Wind limitations. New section inserted.	**R703.3.1 Soffit installation.** New section inserted**.** New section and subsections inserted.
	TABLE R703.3.1 LIMITS FOR ATTACHMENT PER TABKE R703.3(1). New table inserted.	

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	TABLE R703.3(1) SIDING MINIMUM ATTACHMENT AND MINIMUM THICKNESS. New table inserted.	
	R703.3.2 Fasteners. New section.	
	R703.3.3 Minimum fastener length and penetration. New section.	
	R703.4 ~~R703.8~~ Flashing. Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714.The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at all of the following locations:	
	R703.5 ~~R703.3~~ Wood, hardboard and wood structural panel siding. Wood, hardboard and wood structural panel siding shall be installed in accordance with this section and Table R703.3(1). Hardboard siding shall comply with CPA/ANSI A135.6. Hardboard siding used as architectural trim shall comply with CPA/ANSI 135.7.	

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	R703.5.1 Vertical wood siding. New section inserted.	
	R703.5.2 ~~R703.3.1~~ Panel siding. 3/8-inch (9.5 mm) wood structural panel siding shall not be applied directly to studs spaced more than 16 inches (406 mm) on center where long dimension is parallel to studs. Wood structural panel siding 7/16 inch (11.1 mm) or thinner shall not be applied directly to studs spaced more than 24 inches (610 mm) on center. The stud spacing shall not exceed to panel span rating provided by the manufacturer unless then panels are installed with the face grain perpendicular to the studs or over sheathing approved for that stud spacing. Joints in wood, hard board or wood structural panel siding shall be made as follows unless otherwise approved. Vertical joints in panel siding shall occur over framing members, unless wood or wood structural panel sheathing is used, and shall be ship lapped or covered with a batten. Horizontal joints in panel siding shall be lapped a minimum of 1 inch (25 mm) or shall be ship lapped or shall be flashed with Z-flashing and occur over solid blocking wood or wood structural panel sheathing.	

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	R703.6.1 ~~R703.5.1~~ Application. Wood shakes or shingles shall be applied either single-course or double-course over nominal ½-inch (12.7 ~~13~~ mm) wood-based sheathing or to furring strips over ‘/2-inch (13 mm) nominal non-wood-sheathing . A ~~permeable~~ water-resistive barrier shall be provided over all sheathing, with horizontal overlaps in the membrane of not less than 2 inches (51 mm) and vertical overlaps of not less than 6 inches (152 mm). Where horizontal furring strips are used, they shall be 1 inch by 3 inches or 1 inch by 4 inches (25 mm by 76 mm or 25 mm by 102mm) and shall be fastened ~~horizontally~~ to the studs with 7d or 8dbox nails and shall be spaced a distance on center equal to the actual weather exposure of the shakes or shingles, not to exceed the maximum exposure specified in Table R703.6.1 ~~R703.5.2~~. When installing shakes or shingles over a nonpermeable water-resistive barrier, fjurring strips shall be placed first vertically over the barrer and in addition, horizontally furring strips shall be fastened to the vertical furring strips prior to attaching the shakes or shingles to the horiztonal furring strips. The spacing between adjacent shingles to allow for	

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	expansion shall not exceed 1/8 inch (3.2 mm) to ¼ inch (6 mm) apart, and between adjacent shakes, it shall not ~~exceed~~ be 3/8 inch (9.5 mm) to ½ inch (12.7 ~~13~~ mm) apart. The offset spacing between joints in adjacent courses shall be a minimum of 1'/2 inches (38 mm).	
	TABLE R703.6.1 ~~R703.5.2~~ MAXIMUM WEATHER EXPOSURE FOR WOOD SHAKES AND SHINGLES ON EXTERIOR WALLS 3. Revised	
	TABLE R703.6.3(1). SINGLE COURSE SIDEWAKK FASTENERS. Revised.	
	TABLE R703.6.3(2). DOUBLE COURSE SIDEWAKK FASTENERS. Revised.	
		R703.7.1 Lath. **Exception:** Lath is not required over masonry, cast-in-place concrete, precast concrete or stone substrates prepared in accordance with ASTM C1063.
		R703.7.2 Plaster. Plastering with ~~portland~~ cement plaster shall be in accordance with ASTM C926. Cement materials shall be in accordance with one of the following: 1. Masonry cement conforming to ASTM C91 Type M, S or N. 2. Portland cement conforming to ASTM C150 Type I, II, or III. 3. Blended hydraulic cement conforming to ASTM C595 Type IP, IS (<70), IL, or IT (S<70).

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		4. Hydraulic cement conforming to ASTM C1157 Type GU, HE, MS, HS, or MH. 5. Plastic (stucco) cement conforming to ASTM C1328. Plaster shall be not less than three coats where applied over metal lath or wire lath and shall be not less than two coats where applied over masonry, concrete, pressure-preservative-treated wood or decay-resistant wood as specified in Section R317.1 or gypsum backing. If the plaster surface is completely covered by veneer or other facing material or is completely concealed, plaster application need be only two coats, provided the total thickness is as set forth in Table R702.1(1). On wood-frame construction with an on-grade floor slab system, exterior plaster shall be applied to cover, but not extend below, lath, paper and screed. The proportion of aggregate to cementitious materials shall be as set forth in Table R702.1(3).
	R703.8 Anchored stone and masonry veneer, general. New section and subsections.	
		R703.8.4 Anchorage. Masonry veneer shall be anchored to the supporting wall studs with corrosion-resistant metal ties embedded in mortar or grout and extending into the veneer a minimum 1 ½ inches (38 mm), with not less than 5/8-inch (15.9 mm) mortar or grout cover to outside face. Masonry veneer shall conform to Table R703.8.4(1). For masonry veneer tie attachment through insulating

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		sheathing not greater than 2 inches (51 mm) in thickness to not less than 7/16 performance category wood structural panel, see Table R703.8.4(2).
		TABLE R703.8.4(1) ~~R703.8.4~~ TIE ATTACHMENT AND AIRSPACE REQUIREMENTS. Renumbered**.**
		TABLE 703.8.4(2) REQUIRED BRICK TIE SPACING FOR DIRECT APPLICATION TO WOOD STRUCTURAL PANEL SHEATHING. New table.
	R703.11.1.1 Fasteners ~~R703.ll.1.1Vinyl soffit panels~~. Unless specified otherwise by the manufacturer's instructions, fasteners for vinyl siding shall be 0.120-inch (3 mm) shank diameter nail with a 0.313-inch (8 mm) head or 16-gauge staple with a 3/8-inch (9.5 mm) to ½-inch (12.7 mm) crown. ~~Soffit panels shall be individually fastened to a supporting component such as a nailing strip, fascia or subfascia component or as specified by the manufacturer's instructions~~.	
	R703.11.1.2 Penetration depth. New section.	
	R703.11.1.3 Spacing. New section.	
	R703.11.1.4 Vinyl soffit panels. New section.	
		R703.11.2 Installation over foam plastic sheathing. Where vinyl siding and insulated vinyl siding used with foam plastic sheathing shall be installed in accordance with Section R703.11 ~~R703.11.2.1,~~

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		~~R703.11.2.2 or R703.11.2.3~~ and shall have a design wind pressure resistance in accordance with Table R703.11.2. **Exception:** 1. Where the foam plastic sheathing is applied directly over wood structural panels, fiberboard, gypsum sheathing or other approved backing capable of independently resisting the design wind pressure, the vinyl siding shall be installed in accordance with Sections R703.3.3 and R703.11.1. 2. Where the vinyl siding manufacturer's product specifications provide an approved design wind pressure rating for installation over foam plastic sheathing, use of this design wind pressure rating shall be permitted and the siding shall be installed in accordance with the manufacturer's installation instructions. 3. Where the foam plastic sheathing and its attachment have a design wind pressure resistance complying with Sections R316.8 and R301.2.1, the vinyl siding shall be installed in accordance with Sections R703.3.3 and R703.11.1.
	R703.11.2.1 Basic wind speed not exceeding 115 ~~90~~ miles per hour and Exposure Category B. Where the basic wind speed does not exceed 115 ~~90~~ miles per hour (51 ~~40~~ m/s), the Exposure	

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	Category is B and gypsum wall board or equivalent is installed on the side of the wall opposite the foam plastic sheathing, the minimum siding fastener penetration into wood framing shall be 1'/4inches (32 mm) using minimum 0.120-inch diameter nail (shank) with a minimum 0.313-inch diameter head, 16 inches on center. The foam plastic sheathing shall be minimum V2-inch-thick (12.7 mm) (nominal) extruded polystyrene per ASTM C 578, '/2-inch-thick (12.7 mm) (nominal) polyisocyanurate per ASTM C 1289, or 1inch-thick (25 mm) (nominal) expanded polystyrene per ASTM C 578.	
	R703.11.2.2Basic wind speed exceeding 115 ~~90~~ miles per hour or Exposure Categories C and D. Where the basic wind speed exceeds 115 ~~90~~ miles per hour (51 ~~40~~ m/s) or the Exposure Category is C or D, or all conditions of Section R703.ll.2.1 are not met, the adjusted design pressure rating for the assembly shall meet or exceed the loads listed in Tables R301.2(2) adjusted for height and exposure using Table R301.2(3). The design wind pressure rating of the vinyl siding for installation over solid sheathing as provided in the vinyl siding manufacturer's product	

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	specifications shall be adjusted for the following wall assembly conditions: 1. For wall assemblies with foam plastic sheathing on the exterior side and gypsum wall board or equivalent on the interior side of the wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.39. 2. For wall assemblies with foam plastic sheathing on the exterior side and no gypsum wall board or equivalent on the interior side of wall, the vinyl siding's design wind pressure rating shall be multiplied by 0.27.	
	R703.12 Adhered masonry veneer installation. Adhered masonry veneer shall <u>comply with the requirements of Section R703.7.3 and the requirements in Sections 12.1 ans 12.3 of TMS 402/ACI 530/ASCE 5. Adhered masonry veneer shall be installed in accordance with Section R703.7.1, Article 3.3C of TMS 602/ACI 530.1/ASCE 6 or</u> ~~installed in accordance with~~ the manufacturer's instructions.	
	R703.12.2 Flashing at foundation. A corrosion-resistant screed or flashing of a minimum 0.019-inch (0.48 mm) or 26-gage galvanized or plastic with a minimum vertical attachment flange of 3'/2 inches	

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	(89 mm) shall be installed to extend a minimum of 1inch (25 mm) below the foundation plate line on exterior stud walls in accordance with Section R703.8. The water-resistive barrier, as required by Table R703.4~~, Footnote w, shall lap over the exterior of the attachment flange of the screed or flashing~~.	
	R703.12.3 Water-reactive barrier. New section.	
	R703.13 Insulated vinyl siding. New section and subsections.	
	R703.14 Polypropylene siding. New section and subsections.	
		R703.14.3 Flame spread index. New section.
		TABLE R703.11.2 ADJUSTED MINIMUM DESIGN WIND PRESSURE REQUIREMENT FOR VINYL SIDING. New table.
	R703.15 Cladding attachment over foam sheathing to wood framing. New section and subsections.	
		TABLE R703.15.1 CLADDING MINIMUM FASTENING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHAETHING TO SUPPORT CLADDING WEIGHT. Revised.
	R703.16 Cladding attachment over foam sheathing to cold-form steel framing. New section and subsections.	
		TABLE R703.16.1 CLADDING MINIMUM FASETNING REQUIREMENTS FOR DIRECT ATTACHMENT OVER

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		FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT. Revised.
		TABLE R703.16.1 FURRING MINIMUM FASETNING REQUIREMENTS FOR DIRECT ATTACHMENT OVER FOAM PLASTIC SHEATHING TO SUPPORT CLADDING WEIGHT. Revised.
	R703.17 Cladding attachment over foam sheathing to masonry or concrete wall construction. New section and subsections**.**	
	CHAPTER 8 ROOF-CEILING CONSTRUCTION	**CHAPTER 8 ROOF-CEILING CONSTRUCTION**
	R802.1 General ~~Identification~~. Wood and wood-based products used for load-supporting purposes shall conform to the applicable provisions of this section ~~Load-bearing dimension lumber for rafters, trusses and ceiling joists shall be identified by a grade mark of a lumber grading or inspection agency that has been approved by an accreditation body that complies with DOC PS 20. In lieu of a grade mark, a certificate of inspection issued by a lumber grading or inspection agency meeting the requirements of this section shall be accepted~~.	
	R802.1.1 Sawn lumber ~~Blocking~~. Revised ~~Blocking shall be a minimum of utility grade lumber~~.	

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	R802.1.2 Structural glued laminated timbers. New section.	
	R802.1.3 Structural log members. New section.	
	R802.1.4 Structural composite lumber. New section.	
		R802.1.5.4 Labeling. In addition to the labels required by Section 802.1.1 for sawn lumber and Section 803.2.1 for wood structural panels, each piece of fire-retardant-rated lumber and wood structural panels shall be labeled. The label shall contain:
	R802.1.6 Cross-laminated timbers. New section.	
	R802.1.7 Engineered wood rim board. New section.	
		R802.1.8 Prefabricated wood I-joists. New section.
		R802.2 Design and construction. The roof and ceiling assembly shall provide continuous ties across the structure to prevent roof thrust from being applied to the supporting walls. The assembly shall be designed and constructed ~~The framing details required in Section R802 apply to roofs having a minimum slope of three units in 12 units horizontal (25 percent slope) or greater. Roof ceilings shall be designed and constructed~~ in accordance with the provisions of this chapter and Figures R606.11(11), R606.11(12) and R606.1.3(3) or in accordance with AWC NDS. ~~Components of roof ceilings shall be fastened in accordance with Table R602.3(1).~~

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		R802.3 Ridge. New section.
	R802.3.3 Blocking. New section.	
		R802.4 Rafters. New section.
		R802.4.1 Ridge size. New section.
		R802.4.4 Rafter supports. New section.
		R802.4.6 Collar ties. New section.
		R802.5 Ceiling joists. New section and subsections.
	TABLE R802.11 RAFTER OR TRUSS UPLIFT CONNECTION FORCES FROM WIND (POUNDS PER CONNECTION). Revised.	
		R803.2.3 Installation. Wood structural panel used as roof sheathing shall be installed with joints staggered or not staggered in accordance with Table R602.3(1), APA E30 for wood roof framing or with Table R804.3 for cold-formed steel roof framing. Wood structural panel roof sheathing in accordance with Table R503.2.1.1(1) shall not cantilever more than 9 inches (229 mm) beyond the gable endwall unless supported by gable overhang framing.
	R804.2.1 Material. Load-bearing, cold-formed steel framing members shall be cold-formed to shape from structural quality sheet steel complying with the requirements of ASTM A 1003, Structural Grades 33 Type H and 50 Type H.~~one of the following:~~ ~~1. ASTM A 653: Grades 33 and 50 (Class 1 and 3).~~ ~~2. ASTM A 792: Grades 33 and 50A.~~	

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	~~3. ASTM A 1003: Structural Grades 33 Type Hand 50 Type H.~~	
	R804.2.3 Dimension, thickness and material grade. New section.	
	R804.2.5 ~~R804.2.4~~ Fastening requirements. Screws for steel-to-steel connections shall be installed with a minimum edge distance and center-to-center spacing of '/2 inch (12.7 ~~13~~ mm), shall be self-drilling tapping, and shall conform to ASTM C 1513. Structural sheathing shall be attached to cold-formed steel roof rafters with minimum No. 8 self-drilling tapping screws that conform to ASTM C 1513. Screws for attaching structural sheathing to cold-formed steel roof framing shall have a minimum head diameter of 0.292 inch (7.4 mm) with countersunk heads and shall be installed with a minimum edge distance of 3/8 inch (9.5 ~~10~~ mm). Gypsum board ceilings shall be attached to cold-formed steel joists with minimum No. 6 screws conforming to ASTM C 954 or ASTM C 1513 with a bugle-head style and shall be installed in accordance with Section R805.For all connections, screws shall extend through the steel a minimum of three exposed threads. Fasteners shall have rust-inhibitive coating suitable for	

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	the installation in which they are being used, or be manufactured from material not susceptible to corrosion. Where No. 8 screws are specified in a steel-to-steel ~~connection, reduction of the required number of screws in the connection is permitted in accordance with the reduction factors in Table R804.2.4 when larger screws are used or when one of the sheets of steel being connected is thicker than 33 mils (0.84 mm). When applying the reduction factor, the resulting number of screws shall be rounded up.~~	
	TABLE R804.3 ROOF FRAMING FASTENING SCHEDULE. Revised.	
	TABLE R804.3.1.1(1) CEILING JOIST SPANS SINGLE SPANS WITH BEARING STIFFENERS 10 PSF LIVE LOAD (NO ATTIC STORAGE). Revised.	**TABLE R804.3.1.1(1) CEILING JOIST SPANS SINGLE SPANS WITH BEARING STIFFENERS 10 PSF LIVE LOAD (NO ATTIC STORAGE).** Revised.
	TABLE R804.3.1.1(2) CEILING JOIST SPANS SINGLE SPANS WITH BEARING STIFFENERS 20 ~~10~~ PSF LIVE LOAD (LIMITED ~~NO~~ ATTIC STORAGE). Revised.	**TABLE R804.3.1.1(2) CEILING JOIST SPANS SINGLE SPANS WITH BEARING STIFFENERS 20 PSF LIVE LOAD (LIMITED ATTIC STORAGE).** Revised.
	TABLE R804.3.2.1(1) ROOF RAFTER SPANS. Revised.	**TABLE R804.3.2.1(1) ROOF RAFTER SPANS.** Revised.
		TABLE R804.3.2.1(2) ULTIMATE DESIGN WIND SPEED TO EQUIVALENT SNOW LOAD CONVERSION. Revised.
	R804.3.8 ~~R804.3.9~~ Roof tie-down. Roof assemblies shall be connected to walls	

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	below in accordance with Table R804.3. A continuous load path shall be provided to transfer uplift loads to the foundation. ~~subject to wind uplift pressures of 20 pounds per square foot (0.96 kPa) or greater, as established in Table R301.2(2), shall have rafter-to-bearing wall ties provided in accordance with Table R802.ll.~~	
		TABLE R804.3.7.1 REQUIRED LENGTHS FOR CEILING DIAPHRAGMS AT GABLE ENDWALLS GYPSUM BOARD SHEATHED, CEILING HEIGHT = 8 FEET. Revised.
	R806.1 Ventilation required. Enclosed attics and enclosed rafter spaces formed where ceilings are applied directly to the underside of roof rafters shall have cross ventilation for each separate space by ventilating openings protected against the entrance of rain or snow. Ventilation openings shall have a least dimension of '/16inch (1.6 mm) minimum and '/4 inch (6.4 mm) maximum. Ventilation openings having a least dimension larger than '/4 inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth, or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and '/4 inch (6.4 mm) maximum. Ventilation openings	

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	having a least dimension larger than ¼ inch (6.4 mm) shall be provided with corrosion-resistant wire cloth screening, hardware cloth or similar material with openings having a least dimension of 1/16 inch (1.6 mm) minimum and ¼ inch (6.4 mm) maximum. Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air. ~~Openings in roof framing members shall conform to the requirements of Section R802.7. Required ventilation openings shall open directly to the outside air.~~ ~~Exception: Attic ventilation shall not be required when determined not necessary by the code official due to atmospheric or climatic conditions.~~	
	R806.5 Unvented attic and unvented enclosed rafter assemblies. Unvented attic assemblies (spaces between the ceiling joists of the top story and the roof rafters) and unvented enclosed rafter assemblies (spaces between ceilings that are applied directly to the underside of roof framing members/rafters and the structural roof sheathing at the top of the roof framing embers/rafters) shall be	**R806.5 Unvented attic and unvented enclosed rafter assemblies**. Revise-5.2. In Climate Zone 1, 2 and 3, ait-permeable insulation installed in unvented attics shall meet the following requirements; ~~Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.~~ 5.2.1 An approved vapor diffusion port shall be installed not more than 12 inches (305

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	permitted if all the following conditions are met: 1. The unvented attic space is completely contained within the building thermal envelope. 2. No interior Class I vapor retarders are installed on the ceiling side (attic floor) of the unvented attic assembly or on the ceiling side of the unvented enclosed rafter assembly. 3. Where wood shingles or shakes are used, a minimum ¼ inch (6 mm) vented air space separates the shingles or shakes and the roofing underlayment above the structural sheathing. 4. In Climate Zones 5, 6, 7 and 8, any air-impermeable insulation shall be a Class II vapor retarder, or shall have a Class II vapor retarder coating or covering in direct contact with the underside of the insulation. 5. Insulation shall be located in accordance with the following: ~~Either Items 5.1, 5.2 or 5.3 shall be met, depending on the air permeability of the insulation directly under the structural roof sheathing.~~ 5.1. Item 5.1.1., 5.1.2, 5.1.3 or 5.1.4 shall be met, dependent on the air	mm) from the highest point if the roof, measured vertically from the highest point of the roof to the lower edge of the port. 5.2.2 The port area shall be greater than or equal to 1:600 of the ceiling area. Where there are multiple ports in the attic, the sum of the port area shall be greater than or equal to the area requirement. 5.2.3 The vapor-permeable membrane in the vapor diffusion port shall have a vapor permeance rating greater than or equal to 20 perms when tested in accordance with Procedure A of ASTM E96. 5.2.4 The vapor diffusion port shall serve as an air barrier between the attic and the exterior of the building. 5.2.5 The vapor diffusion port shall protect the attic against the entrance of rain and snow. 5.2.6 Framing members and blocking shall block the free flow of water vapor to the port. Not less than a 2-inch (51 mm) space shall be provided between any blocking and the roof sheathing. Air-permeable insulation shall be permitted within that space. 5.2.7 The roof slope shall be greater than or equal to 3:121 (vertical/horizontal).

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	impermeability of the insulation directly under the structural roof sheathing. 5.1.1. Where only air-impermeable insulation is provided, it shall be applied in direct contact with the underside of the structural roof sheathing. ~~only. Insulation shall be applied indirect contact with the under– side of the structural roof sheathing.~~ 5.1.2. Where air-permeable insulation is provided inside of the building thermal envelope, it shall be installed in accordance with Section 5.1. In addition to the air-permeable insulation installed directly below the structural, rigid board or sheet insulation shall be installed directly above the structural roof sheathing in accordance with the R-values in Table R806.5 for condensation control. 5.1.3. Where both air-impermeable and air-permeable insulation are provided, the air-permeable insulation shall be applied in direct contact with the underside of the structural roof sheathing in accordance with Item 5.1.1 and shall be in accordance with the R-values in Table R806.5 for condensation control. The air-permeable insulation shall be installed directly under the air-impermeable insulation shall be	5.2.8 Where only air-permeable insulation is used, it shall be installed directly below the structural roof sheathing. 5.2.9 Air-impermeable insulation, if any, shall be directly above or below the structural roof sheathing and is not required to meet the R-value in Table 806.5. Where directly below the structural roof sheathing, there shall be no space between the air-impermeable insulation and air-permeable insulation. 5.2.10 The air shall be supplied at a flow rate greater than or equal to 50 CFM (23.6 L/s) ore 1,000 square feet (93 m^3) of ceiling. The air shall be supplied from ductwork providing supply air to the occupiable space when the conditioning system is operating. Alternatively, the air shall be supplied by a supply fan when the conditioning system is operating.

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	installed directly under the air-impermeable insulation. 5.1.4. Alternatively, sufficient rigid board or sheet insulation shall be installed directly above the structural roof sheathing to maintain the monthly average temperature of the underside of the structural roof sheathing above 45 ^{0}F (7^{0}C). For calculation purposes, an interior air temperature of 68^{0}F (20^{0}C) is assumed and the exterior air temperature is assumed to be the monthly average outside air temperature of the three coldest months. 5.2. Where preformed insulation board is used as the air-impermeable insulation layer, it shall be sealed at the perimeter of each individual sheet interior surface to form a continuous layer.	
	CHAPTER 9 ROOF ASSEMBLIES	**CHAPTER 9 ROOF ASSEMBLIES**
	R902.1 Roofing covering materials. **Exceptions:** Add- 4. Class A roof assemblies include slate installed over underlayment over combustible decks.	
	R902.3 Building-integrated photovoltaic product. New section.	
	R902.4 Rooftop-mounted panels and modules. New section.	

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SECTION R903.5 SNOW SHEDDING AND IMPACT AREAS		
Section R903.5 Snow shedding and impact areas. Snow shedding onto adjacent properties is prohibited. Snow shed impact areas shall be designed to contain shedding snow from structures and prevent snow from encroaching onto adjacent properties exceed 154 p_g when located in Washoe County or Carson City, or exceeds 69 p_g when located in Storey County. The roof and eaves of all structures shall be designed so that snow shed impact areas will not occur in or on required exits, parking areas, driveways, LPG storage tanks, walkways, and public areas. **Exception:** The snow shed impact areas may be reduced provided an engineered snow restraint system, designed in accordance with this code, is incorporated into the roof design and the roof drainage system.		
	R905.1.1 Underlayment. New section and subsections.	**R905.1.1 Underlayment.** **Exceptions:** Add- 3. As an alternative, two layers of underlayment complying with ASTM D226 Type II I or ASTM D4869 Type III or Type IV shall be permitted to be installed as follows in 3.1-3.4: 3.1 Apply a 19-inch-wide (483 mm) strip of underlayment parallel with the eave. Starting

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		at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). end laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). 3.2 The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. 3.3 Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.25 mm). Minimum thickness of the outside edge of plastic caps shall be 0.035 inch (0.89 mm). 3.4 The cap nail shank shall be not less than 0.083 inch (2.11 mm) for ring shank cap nails and 0.091 inch (2.31 mm) for smooth shank cap nails. Cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than ¾ inch (19 mm) into the roof sheathing.
	R905.1.2 Ice barriers. New section.	
	TABLE R905.1.1(1) UNDERLAYMENT TYPES. New table.	

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	TABLE R905.1.1(2) UNDERLAYMENT APPLICATION. New table	
	TABLE R905.1.1(3) UNDERLAYMENT ATTACHMENT New table	
	R905.2.7 Ice barriers. New section.	
		R905.2.8 Flashing. Flashing for asphalt singles shall comply with this section and the asphalt shingle manufacturer's approved installation instructions.
	R905.3.7 Application. Tile shall be applied in accordance with this chapter and the manufacturer's installation instructions, based on the following: 1. Climatic conditions. 2. Roof slope. 3. Underlayment system. 4. Type of tile being installed. Clay and concrete roof tiles shall be fastened in accordance with this section and the manufacturer's installation instructions. Perimeter tiles shall be fastened with a minimum of one fastener per tile. Tiles with installed weight less than 9 pounds per square foot (0.4 kg/m^2) require not less than ~~a minimum of~~ one fastener per tile regardless of roof slope. Clay and concrete roof tile attachment shall be in accordance with the manufacturer's installation instructions where applied in areas where the ultimate design wind speed exceeds 130 ~~100~~ miles	

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	per hour (58 ~~45~~ m/s) and on buildings where the roof is located more than 40 feet (12 192 mm) above grade. In areas subject to snow, a minimum of two fasteners per tile is required. In all other areas, clay and concrete roof tiles shall be attached in accordance with Table R905.3.7.	
	R905.4.3.1 Ice barriers. New section.	
	R905.5.3.1 Ice barriers. New section.	
	R905.6.3.1 Ice barrier. Where required, ice barriers shall comply with Section 905.1.2. ~~In areas where there has been a history of ice forming along the eaves causing a backup of water as designated in Table R301.2(I), an ice barrier that consists of at least two layers of underlayment cemented together or a self-adhering polymer modified bitumen sheet shall be used in lieu of normal underlayment and extend from the lowest edges of all roof sur- faces to a point at least 24 inches (610 mm) inside the exterior wall line of the building.~~ ~~Exception: Detached accessory structures that contain no conditioned floor area.~~	
	R905.7.5 Application. Wood shingles shall be installed according to this chapter and the manufacturer's installation instructions. Wood shingles shall be laid	

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	with a side lap not less than l'/2 inches (38 mm) between joints in courses, and ~~no~~ two joints shall be in direct alignment in any three adjacent courses. Spacing between shingles shall not be less than '/4 inch to 3/g inch (6.4 mm to 9.5 mm). Weather exposure for wood shingles shall not exceed those set in Table R905.7.5(1). Fasteners for untreated (naturally durable) wood shingles shall be box nails in accordance with Ta=ble R905.7.5(2). Nails shall be stainless steel Type 304 or 316 or hot-dipped galvanized with a coating weight of AASTM A 153 Class D (1.0 oz/ft^2). Alternatively, two 16-gauge stainless steel Type 304 or 316 staples with crown widths 7/16 inch (11.1 mm) minimum, ¾ inch (19.1 mm) maximum, shall be used. Fasteners installed within 15 miles (24 km) of salt water costal areas shall be stainless steel Type 316. Fasteners for fire-retardant-treated shingles in accordance with Section R902 or pressure-impregnated-preservation-treated shingles of naturally durable wood in accordance with AWPA U1 shall be stainless steel Type 316. All fasteners shall have a minimum penetration into the sheathing of ¾ inch (19.1 mm). For sheathing less than ¾ inch (19.1 mm)	

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	thickness, each fastener shall penetrate through the sheathing. ~~Fasteners for wood shingles shall be corrosion resistant with a minimum penetration of '/2 inch (13 mm) into the sheathing. For sheathing less than V2 inch (13 mm) in thickness, the fasteners shall extend through the sheathing.~~ Wood shingles shall be attached to the roof with two fasteners per shingle, positioned in accordance with the manufacturer's installation instructions. Fastener packaging shall bear a label indicating the appropriate grade material or coating material. ~~No more than 3/4 inch (19 mm) from each edge and no more than 1 inch (25 mm) above the exposure line.~~	
	TABLE R905.7.5(1) ~~R905.7.5~~ WOOD SHINGLE WEATHER EXPOSURE AND ROOF SLOPE. Renumbered and revised**.**	
	TABLE R905.7.5(2) NAIL REQUIREMENTS FOR WOOD SHAKES AND WOOD SHINGLE. New table**.**	
	R905.8.3.1 Ice barrier. New section**.**	
	R905.8.6 Application. Wood shakes shall be installed according to this chapter and the manufacturer's installation instructions. Wood shakes shall be laid with a side lap not less than 1'/2 inches (38 mm) between joints in adjacent	

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	courses. Spacing between shakes in the same course shall be 3/g inch to 5/s inch (9.5 mm to 15.9 mm) for shakes and taper sawn shakes of naturally durable wood and shall be 3/8 inch to 78 inch (9.5 mm to 15.9 mm) for preservative-treated taper sawn shakes. Weather exposure for wood shakes shall not exceed those set forth in Table R905.8.6. Fasteners for untreated (naturally durable) wood shakes shall be box nails in accordance with Table R905.7.5(2). Nails shall be stainless steel Type 304, or Type 316 or hot-dipped with a coating weight of ASTM A 153 Class D (1.0 oz/ft^2). Alternatively, two 16-gauge Type 304 or Type 316 stainless steel staples, with crown widths 7/16 inch (11.1 mm) minimum, ¾ inch (19.1 mm) maximum, shall be used. Fasteners installed within 15 miles (24 km) of salt water costal areas shall be stainless steel Type 316. ~~Corrosion resistant, with a minimum penetration of '/2 inch (12.7 mm) into the sheathing. For sheathing less than '/2 inch (12.7 mm) thick, the fasteners shall extend through the sheathing.~~ Wood shakes shall be attached to the roof with two fasteners per shake, positioned in accordance with the	

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	manufacture's installation instructions. Fasteners for fire-retardant-treated (as defined in Section R902) shakes or pressure-impregnated-treated (as defined in Section R902) in accordance with AWPA U1 shall be stainless steel Type 316. All fasteners shall have a minimum penetration into the sheathing of ¾ inch (19.1 mm). where the sheathing is less than ¾ inch (19.1 mm) thick, each fastener shall penetrate through the sheathing. Fasteners shall bear a label indicating the appropriate grade material or coating weight. ~~No more than 1 inch (25 mm) from each edge and no more than 2 inches (51 mm) above the exposure line.~~	
		R905.9 Built-up roofs. The installation of built-up roofs shall comply with the provisions of this section and the manufacturer's approved installation instructions.
		R905.11 Modified bitumen roofing. The installation of modified bitumen roofing shall comply with the provisions of this section and the manufacturer's approved installation instructions.
		R905.11.2.1 Base sheet. New section.
		R905.12.2 Material standards. Thermoset single-ply roof coverings shall comply with ASTM D 4637-or ASTM D 5019 ~~or CGSB 37-GP-52M~~.

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R905.13.		**R905.13.2 Material standards.** Spray-applied polyurethane foam insulation shall comply with ASTM D4434, ASTM D6754 or ASTM D6878.~~ASTM C 1029, Type III or IV or ASTM D 7425.~~
R905.9	**R905.14.2 Material standards**. Spray-applied polyurethane foam insulation shall comply with ASTM C 1029, Type III or IV or ASTM D 7425.	
	R905.16 Photovoltaic ~~modules/~~shingles. The installation of photovoltaic ~~modules/~~shingles shall comply with the provisions of this section, Section R324 and NFPA 70.	
	R905.16.1 Deck requirements. New section.	
	R905.16.2 Deck slope. New section.	
	R905.16.3 Underlayment. New section.	
	R905.16.4 Underlayment application. New section.	
	R905.16.4.1 Ice barrier. New section.	
	R905.16.4.2 Underlayment and high winds. New section.	
		R905.17 Building-integrated Photovoltaic (BIPV) roof panels applied directly to the roof deck. New sections and subsection.
	TABLE R906.2 MATERIAL STANDARDS FOR ROOF INSULATION. Revised.	
	SECTION R907 ROOFTOP-MOUNTED PHOTOVOLTAIC SYSTEMS. New section and subsections inserted.	

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	SECTION R908 ~~R907~~ REROOFING. Renumbered.	
	R907.1 General. **Exception:** 1. Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide positive roof drainage. 2. For roofs that provide positive drainage, re-covering or replacing an existing roof covering shall not require secondary (emergency overflow) drains or scuppers of Section R903.4.1 to be added to an existing roof.	
	R908.3 Roof replacement. New section.	
	R908.3.1 Roof re-cover. New section.	**R908.3.1 Roof re-cover.** Add- 4. The application of a new protective roof coating over an existing protective roof coating, metal roof panel, metal roof shingle, mineral surfaced roll roofing, built-up roof, modified bitumen roofing, thermoset and thermoplastic single-ply roofing and spray polyurethane foam roofing system shall be permitted without tear-off of existing roof coverings.
	R908.3.1.1 Roof re-cover not allowed. New section.	

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	SECTION R909 ROOFTOP-MOUNTED PHOTOVOLTAIC PANEL SYSTEMS. New section and subsections.	
	CHAPTER 10 CHIMNEYS AND FIREPLACES	**CHAPTER 10 CHIMNEYS AND FIREPLACES**
	R1001.4.1.1 Cold-formed steel framing. New section**.**	
	R1002.2 Installation. Masonry heaters shall be installed in accordance with this section and comply with one of the following: 1. Masonry heaters shall comply with the requirements of ASTM E 1602.~~;or~~ 2. Masonry heaters shall be listed and labeled in accordance with UL 1482 or CEN 1250 and installed in accordance with the manufacturer's installation instructions.	
	R1002.5 Masonry heater clearance. **Exceptions:** Revise- 2. Masonry heaters listed and labeled in accordance with UL 1482 or CEN 15250 and ~~may be~~ installed in accordance with the listing specifications and the manufacturer's written instructions.	
	R1003.4.1.1 Cold-formed steel framing. New section**.**	
	R1003.18 Chimney clearances. **Exceptions:**	

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	Revise- 3. Exposed combustible trim and the edges of sheathing materials, such as wood siding and flooring, shall be permitted to abut the masonry chimney side walls, in accordance with Figure R1003.18, provided such combustible trim or sheathing is not less than 8 inches (203 mm) ~~a minimum of 12 inches (305 mm)~~ from the inside surface of the nearest flue lining. ~~Combustible material and trim shall not overlap the comers of the chimney by more than 1 inch (25 mm).~~	
	R1004.5 Gasketed fireplace doors. New section**.**	
		R1005.8 Insulation shield. New section.
	R1006.5 Outlet. The exterior air outlet shall be located in the back or side of the fireplace chamber or shall be located outside of the firebox, at the level of the hearth and not greater that ~~Locating the exterior air outlet in the back or sides of the firebox chamber or within~~ 24 inches (610 mm) from ~~of~~ the firebox opening ~~on or near the floor is permitted~~. The outlet shall be closable and designed to prevent burning material from dropping into concealed combustible spaces.	
	CHAPTER 11 ENERGENCY EFFICIENCY	**CHAPTER 11 ENERGY EFFICIENCY**

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		N1101.6 AIR-IMPERMEABLE INSULAYION. New definition.
CHAPTER 11 ENERGY EFFICIENCY- entire chapter deleted	**N1101.6 ALTERATION.** New definition**.**	
	N1101.6 CIRCULATING HOT WATER SYSTEM. New definition	
	N1101.6 CONDITIONED SPACE. Revised section.	
	N1101.6 CONTINIOUS INSULATION. New definition	
	N1101.6 FENESTRATION. Revised section.	
	N1101.6 FENESTRATION, VERTICAL. New definition	
	N1101.6 HISTORIC BUILDING. New definition	
	N1101.6 INSULATED SIDING. New definition	
	N1101.6 RATED DESIGN. New definition	
	N1101.6 REPAIR. Revised section.	
	N1101.6 REROOFING. New definition	
	N1101.6 ROOF RECOVER. New definition	
	N1101.6 ROOF REPAIR. New definition	
	N1101.6 ROOF REPAIR. New definition	
	N1101.6 ROOF REPLACEMENT. New definition	
	N1101.8 TROPICAL CLIMATE ZONE. New definition	
		N1101.10.1 (R303.1.1) Building thermal envelope issuance.

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		Exception: For roof insulation installed above the deck, the R-value shall be labeled as required by the material standards specified in Table R906.2.
		TABLE N1102.10.3(1) [R303.1.3(1)] DEFAULT GLAZED WINDOW, GLASS DOOR AND SKYLIGHT ~~FENESTRATION~~ U-FACTORS. Revised.
		TABLE N1102.10.3(2) [R303.1.3(1)] DEFAULT OPAQUE DOOR U-FACTORS. Revised.
	N1101.12.1 (R303.1.1) Building thermal envelope insulation. An R-value identification mark shall be applied by the manufacturer to each piece of building thermal envelope insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and R-value of insulation installed in each element of the building thermal envelope. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled R-value, installed density, coverage area and number of bags installed shall be listed on the certification. For insulated siding, the R-value shall be labeled on the products package and shall be listed on the certification. ~~sprayed polyurethane foam (SPF) insulation, the installed thickness of the areas covered and R-value of installed thickness shall be listed on the~~	

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	~~certification.~~ The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.	
	N1101.12.3 (R303.1.3) Fenestration product rating. U-factors of fenestration products (windows, doors and sky lights) shall be determined in accordance with NFRC 100 ~~by an accredited, independent laboratory, and labeled and certified by the manufacturer~~. **Exception:** where required, garage door U-factors shall be determined in accordance with either NFRC 100 or AS+NSI/DASMA 105. U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled U-factor shall be assigned a default U-factor from Table N1101.12.3(1) or N1101.12.3(2). The solar heat gain coefficient (SHGC) and visible transmittance (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table N1101.12.3(3).	

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	N1101.10.4.1 (R303.1.4.1) Insulated siding. New section.	
	N1101.15 (R401.2) Compliance. Projects shall comply with one of the following: 1. Sections N1101.14 through N1104. 2. Sections H1105 and the provisions of Sections N1101.14 through N1104 labeled “Mandatory”. 3. An energy rating index (ERI) approach in Section N1106. ~~Sections identified as "mandatory" and with either sections identified as "prescriptive" or the performance approach in SectionN1105.~~	
	N1101.13.1 (R401.2.1) Tropical zone. New section**.**	
	N1102.1 (R402.1) General (Prescriptive). The building thermal envelope shall meet the requirements of Sections N1102.1.1through N1102.1.5 ~~N1102.1.4~~. **Exception:** The following low energy buildings, or portions thereof, separated from the rest of the building by the building thermal envelope assemblies complying with this section shall be exempt from the building thermal envelope provisions of Section N1102. 1. Those with a peak design rate of energy usage less than 3.4 BTU/h-ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of	

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	floor area for space conditioning purposes. 2. Those that do not contain condition spaces.	
	N1102.1.1 (R402.1.1) Vapor retarder. New section**.**	
	N1102.1.2 (R402.1.2) R-value computation. Insulation material used in layers, such as framing cavity insulation or continuous insulation ~~and insulating sheathing,~~ shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table N1102.1.2, the manufacturer's labeled R-vale siding shall be reduced by R-0.6.	
	N1102.2.4 (R402.2.4) Access hatches and doors. Add- **Exception:** Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R1102.1.2 based on the applicable climate zone specified in Chapter 3.	

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	N1102.2.5 (R402.2.5) Mass walls. Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs, or any other wall having a heat capacity greater than or equal to 6 BTU/ft^2 x ^{0}F (123 kJ/m^2 x K).	**N1102.2.5 (R402.2.5) Mass walls**. Mass walls where used as a component of the building thermal envelope shall be one of the following: 1. Above-ground walls of concrete block, concrete, insulated concrete form, masonry cavity, brick but not brick veneer, adobe, compressed earth block, rammed earth, solid timber or solid log. 2. Any wall having a heat capacity greater than or equal to 6 Btu/ft^2* ^{0}F (123 kJm^2*K). for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs, or any other wall having a heat capacity greater than or equal to 6 BTU/ft^2 x ^{0}F (123 kJ/m^2 * K).
	N1102.2.7 (R402.2.7) Walls with partial structural sheathing. New section**.**	
	N1102.2.7 (R402.2.7) Floors. Add- **Exception:** The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall R-value in or exceed the minimum wood frame wall R-value in Table 1102.1.2 and	

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	that extends from the bottom to the top of all perimeter floor framing members.	
	N1102.3.2 (R402.3.2) Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements. Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R1102.1.2 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the dynamic glazing is automatically controlled to modulate the amount of solar gain into the space in multiple steps. Dynamic glazing shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted. **Exception:** Dynamic glazing is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table N1102.1.2.	
	N1102.3.5 (R402.3.5) Sunroom fenestration ~~R-factor~~. ~~All~~ Sunrooms enclosing conditioned spaces shall meet the fenestration requirements of this code.	

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	Exception: For sunrooms with thermal isolation and enclosing conditioned spaces~~,~~ in Climate Zones 2 ~~4~~ through 8, the maximum fenestration U-factor shall be 0.45 and the maximum skylight U-factor shall be 0.70. ~~the following exceptions to the fenestration requirements of this code shall apply:~~ 1. ~~The maximum fenestration R-factor shall be 0.45; and 2. The maximum skylight R-factor shall be 0.70.~~ New fenestration separating the sunroom with thermal isolation from conditioned space shall meet the building thermal envelope requirements of this code.	
	N1102.4.2 (R402.4.2) Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907.	
	N1102.4.4 (R402.4.4) Rooms containing fuel-burning appliances. New section.	

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	TABLE N1102.4.1.1 (R402.4.1.1) AIR BARRIER AND INSULATION INSTALLATION. Revised**.**	
	N1103.2 (R403.2) Hot water boiler outdoor temperature setback. New section**.**	
	N1103.2.1 (R403.2.1) Insulation (Prescriptive). Supply and return ducts in attics shall be insulated to a minimum of R-8 where 3 inches (76.2 mm) in diameter and greater and R-6 where less than 3 inches (76.2 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to a minimum of R-6 where 3 inches (76.2 mm) in diameter or greater and R-4.2 where less than 3 inches (76.2 mm) in diameter. ~~All other ducts shall be insulated to a minimum of R-6.~~ **Exception**: Ducts or portions thereof located completely inside the building thermal envelope.	
	NI103.2.2 (R403.2.2) Sealing (Mandatory). **Exceptions:** Revise- 2. For ducts having a ~~static~~ ~~Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.~~	

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	~~3. Continuously welded and locking-type longitudinal joints and seams in ducts~~ operating at static pressure classification less than 2 inches of water column (500 Pa), pressure classification shall not be required for continuously welded joints and seams, and locking-type joints and seams of other than the snap-lock and button-lock types. ~~require additional closure systems.~~	
	N1103.3.3 (R403.3.3) Duct testing (Mandatory). New section.	**N1103.3.3 (R403.3.3) Duct testing (Mandatory).** **Exceptions:** 1. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope. 2. A duct air-leakage shall not be required for ducts serving heat or energy recovery ventilators that are not integrated with ducts serving heating or cooling systems. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.
	N1103.3.4 (R403.3.4) Duct testing (Prescriptive). New section.	
		N1103.3.6 (R403.3.6) Ducts buried within ceiling insulation. New section and subsections.
		N1103.3.7 (403.3.7) Ducts located in conditioned space. New section.
	N1103.5.1 (R403.5.1) Heated water circulation and temperature maintenance	

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	systems (Mandatory). New section and subsections.	
	N1103.5.2 (R403.5.2) Demand recirculation systems. New section and subsections**.**	
	N1103.5.3 (R403.5.3) ~~Nl103.4.2 (R403.4.2)~~ Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of R-3 shall be applied to the following: 1. Piping larger than ¾ inch (19 mm) and larger nominal diameter. 2. Piping serving more than one dwelling unit. 3. ~~Piping from the water heater to kitchen outlets.~~ 4. Piping located outside the conditioned space. 5. Piping from the water heater to a distribution manifold. 6. Piping located under a floor slab. 7. Buried piping. 8. Supply and return piping in recirculation systems other than demand recirculation systems. 9. ~~Piping with run lengths greater than the maximum run lengths for the nominal pipe diameter given in Table Nl103.4.2.~~	

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	~~All remaining piping shall be insulated to at least R-3 or meet the run length requirements of Table N1103.4.2.~~	
		N1103.10.3 (R403.10.3) Covers. **Exception:** Where more than 75 ~~70~~ percent of the energy for heating, computed over an operation season of not less than 3 calendar months, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be permitted.
	N1103.11 (R403.11) Portable spas (mandatory). New section.	
	N1103.12 (R403.12) Residential pools and permanent spas. New section.	
	N1105.4.2 (R405.4.2) Compliance report. New section.	
	N1105.4.2.1 (R405.4.2.1) Compliance report for permit application. New section.	
	N1105.4.2.2 (R405.4.2.2) Compliance report for certificate of occupancy. New section.	
	TABLE N1105.5.2(1) [R405.5.2(1)] SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS. Revised.	
	SECTION N1106 (R406) ENERGY RATING INDEX COMPLIANCE ALTERNATIVE. New section.	

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		N1106.3 (R406.3) Energy rating index. The Energy Rating Index (ERI) shall be determined in accordance with RES-NET/ICC 301 except that the ERI design ventilation are shall be in accordance with Equation 11.1. Ventilation rate, CFM=(0.01 x total square foot area if house) + [7.5 x (b=number of bedrooms + 1)] **(Equation 11-1)** Energy used to recharge or refuel a vehicle used for transportation on roads that are not on the building site shall not be included in the ERI reference design or the rated design. ~~a numerical integer value that is based on a linear scale constructed such that the ERI reference design ahs an Index value of 100 and a residential building that uses no net energy purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the ERI reference design. The ERI shall consider all energy used in the residential building.~~
		TABLE N1106.4 (R406.4) MAXIMUM ENERGCY RATING INDEX. Revised.
		N1106.6.4 (R406.6.4) N1106.7.2 (406.7.2) Specific approval. Performance analysis tools meeting the applicable sections of Section N1106 shall be approved. Documentation demonstrating the approval of performance analysis tools in accordance with Section N1106.6.1 shall be provided. ~~Tools are permitted to be approved based~~

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		~~on meeting a specified threshold for a jurisdiction. The code official shall approve tools for a specified application or limited scope.~~
		N1106.7.3 (R406.7.3) Input value. When calculations require input values not specified by Sections N1102, N1103, N1104 and N1105, those input values shall be taken from RESNET/ICC 301 ~~an approved source~~.
	SECTION N1107 (R501) EXISTING BUILDINGS- GENERAL. New section.	
	SECTION N1108 (R502) ADDITIONS. New section.	
	SECTION N1109 (R503) ALTERATIONS. New section.	
	CHAPTER 12 MECHANICAL ADMINISTRATION	
	CHAPTER 13 GENERAL MECHANICAL SYSTEM REQUIREMENTS	**CHAPTER 13 GENERAL MECHANICAL SYSTEM REQUIREMENTS**
	M1305.1 Appliance access for inspection service, repair and replacement. Appliances shall be accessible for inspection. Service, repair and replacement without removing permanent construction, other appliances or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches	

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	deep and 30 inches wide (762 mm by 762 mm) shall be provided in front of the control side to service an appliance. ~~Installation of room heaters shall be permitted with at least an 18-inch (457 mm) working space. A platform shall not be required for room heaters.~~	
	M1305.1.3.1 Electrical requirements. A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the appliance location in accordance with Chapter 39. Exposed lamps shall be protected from damage by location or lamp guards.	
		M1305.1.3.2 Pit locations. New section.
	M1305.1.4.3 Electrical requirements. A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed t or near the appliance location in accordance with Chapter 39. Exposed lamps shall be protected from damage by location or lamp guards.	
	M1306.2 Clearance reduction. Reduction of required clearances to combustible assemblies or combustible materials shall be based on Section M1360.2.1 or Section M1306.2.2. ~~clearances shall be in accordance with the appliance~~	

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	~~manufacturer's instructions and Table M1306.2. Forms of protection with ventilated air space shall conform to the following requirements:~~ ~~1. Not less than 1-inch (25 mm) air space shall be provided between the protection and combustible wall surface.~~ ~~2. Air circulation shall be provided by having edges of the wall protection open at least 1inch (25 mm).~~ ~~3. If the wall protection is mounted on a single flat wall away from corners, air circulation shall be provided by having the bottom and top edges, or the side and top edges open at least 1 inch (25 mm).~~ ~~4. Wall protection covering two walls in a corner shall be open at the bottom and top edges at least 1 inch (25 mm).~~	
	M1306.2.1 Labeled assemblies. New section**.**	
	M1306.2.2 Reduction table. Reduction of clearances shall be in accordance with the appliance manufacturer's instructions and Table M1306.2. Forms of protection with ventilated air space shall conform to the following requirements: 1. Not less than 1-inch (25 mm) air space shall be provided between the protection and combustible wall surface.	

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	2. Air circulation shall be provided by having edges of the wall protection open at least 1inch (25 mm). 3. If the wall protection is mounted on a single flat wall away from corners, air circulation shall be provided by having the bottom and top edges, or the side and top edges open at least 1 inch (25 mm). 4. Wall protection covering two walls in a corner shall be open at the bottom and top edges at least 1 inch (25 mm).	
	MI307.2 Anchorage of appliances. Appliances designed to be fixed in position shall be fastened or anchored in an approved manner. In Seismic Design Categories D_0, D_1 and D_2, and in townhouses in Seismic Design Categories C, water heaters and thermal storage units shall be anchored or strapped to resist horizontal displacement caused by earthquake motion in accordance with one of the following: 1. Anchorage and strapping shall be designed to resist a horizontal force equal to one third of the operating weight of the water heater storage tank, acting in any horizontal direction. Strapping shall be at points within the upper one-third and lower one third of	

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	the appliance's vertical dimensions. At the lower point, the strapping shall maintain a minimum distance of 4 inches (102 mm) above the controls. 2. The anchorage strapping shall be in accordance with the appliance manufacturer's recommendations.	
	M1308.2 Protection against physical damage. Where piping will be concealed within light-frame construction assemblies, the piping shall be protected against penetration by fasteners in accordance with Section M1308.2.1 through M1308.2.3. Exception: Cast iron piping and galvanized steel piping shall not be required to be protected. ~~In concealed locations where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1.5 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 gage), shall cover the area of the pipe where the member is notched or bored, and shall extend a minimum of 2~~	

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	~~inches (51 mm) above sole plates and below top plates.~~	
	M1308.2.1 Piping through bored holes or notches. New section.	
	M1308.2.2 Piping on other locations. New section.	
	Mq1308.2.3 Shield plates. New section.	
	CHAPTER 14 HEATING AND COOLING EQUIPMENT AND APPLIANCES	
	M1401.3 Equipment and appliance sizing. **Exceptions:** Heating and cooling equipment and appliance sizing shall not be limited to the capacities determined in accordance with Manual S where either of the following conditions applies: 1. The specified equipment or appliance utilizes multistage technology or variable refrigerant flow technology and the loads calculated in accordance with the approved heating and cooling calculation methodology are within the range of the manufacturer's published capacities for that equipment or appliance. 2. The specified equipment or appliance manufacturer's published capacities cannot satisfy	The

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	both the total and sensible heat gains calculated in accordance with the approved heating and cooling calculation methodology and the next larger standard size unit is specified.	
	M1410.2 Floor mounting. **Exceptions**: Revise- 1. Listed room heaters shall be installed on noncombustible floors, assemblies constructed of noncombustible materials or listed floor protectors listed and labeled in accordance with UL 1618. The materials and dimensions shall be ~~with materials and dimensions~~ in accordance with the appliance manufacturer's instructions.	
	M1411.3.3 Drain line maintenance. New section**.**	
	M1411.4 Condensate pumps. New section**.**	
	M1411.7 Location and protection of refrigerant piping. New section**.**	
	M1412.1Approval of equipment. Absorption systems shall be installed in accordance with the manufacturer's installation instructions. Absorption equipment shall comply with UL 1995 or UL/CSA/ANCE 60335-2-40.	

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	M1413.1 General. Evaporative cooling equipment and appliances shall comply with UL 1995 or UL/CSA/ANCE 60335-2-40 and shall be installed:	
	CHAPTER 15 EXHAUST SYSTEMS	**CHAPTER 15 EXHAUST SYSTEMS**
	M1502.4.4 Dryer exhaust duct power ventilators. New section.	
	M1502.4.5. Dryer exhaust duct power ventilators. New section.	
		SECTION M1503 DOMESTIC COOKING EXHAUST EQUIPMENT ~~RANGE HOODS~~
		M1503.1 General. New section.
		M1503.2 Domestic cooking exhaust. New section.
		M1503.2.1 Open-top broiler exhaust. New section.
		M1503.3 Exhaust discharge. New section.
Section M1503.4 Makeup air required. Exhaust hood systems capable of exhausting in excess of ~~400~~ 600 cubic feet per minute (~~0.19~~ 0.28 m^3/s) shall be provided with makeup air at a rate approximately equal to the exhaust air rate. Such Makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.	**M1503.4 Makeup air required**. Exhaust hood systems capable of exhausting in excess of 400 cubic feet per minute (0.19 m3/s) shall be mechanically or naturally provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with not less than one damper. Each damper shall be a gravity damper or electrically operated damper that automatically opens when the exhaust system operates. Dampers shall be accessible for inspection, service, repair and replacement without removing	

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	permanent construction or any other ducts not connected to the damper being inspected, serviced, repaired or replaced. ~~A means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.~~	
	M1503.4.1 Location. New section.	
		M1503.6 Makeup air required. **Exception:** Makeup air is not required for exhaust systems installed for the exclusive purpose of space cooling and intended to be operated only when windows or other air inlets are open.
		M1503.6.2 Makeup air dampers. New section.
		M1504.3 Exhaust openings. New section.
		M1505.2 Recirculation of air ~~Duct length~~. New section.
		M1505.3 Exhaust equipment. New section.
		M1505.4 Whole-house mechanical ventilation system. New section and subsections.
	M1506.2 Duct lengths. New section.	
	CHAPTER 16 DUCT SYSTEMS	**CHAPTER 16 DUCT SYSTEMS**
	M1601.1 Duct design. Duct systems serving heating, cooling and ventilation equipment shall be installed in accordance with the provisions of this section and ACCA Manual D, the appliance manufacturer's installation instructions or other approved methods.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following: Revise- 2. Factory-made air ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions ~~constructed of Class 0 or Class 1 materials as designated in Table M1601.1.1(1)~~. Revise- 4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards- Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A 653. ~~Minimum thickness of metal duct material shall be as listed in Table M1601.1.1(2). Galvanized steel shall conform to ASTM A 653. Metallic ducts shall be fabricated in accordance with SMACNA Duct Construction Standards Metal and Flexible~~	**M1601.1.1 Above-ground duct systems.** Add- 8. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing shall be provided with access.
	TABLE M1601.1 DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESS FOR SINGLE DWELLING UNITS. New table.	
	Ml601.3 Duct insulation materials. Insert- 3. External reflective duct insulation shall be legibly printed or identified at intervals not greater than 36 inches (914 mm) with the name of the	

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	manufacturer, the product R-value at the specified installed thickness and the flame spread and smoke-developed indices. The installed thickness of the external duct insulation shall include the enclosed air space(s). the product R-value for external reflective duct installation shall be determined in accordance with ASTM C1668.	
	Ml601.4.1 Joints, seams and connections. AH longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards. ~~All~~ Joints, longitudinal and transverse seams, and connections in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Tapes and mastics used to seal fibrous glass ductwork shall be listed and labeled in accordance with UL 181A and shall be marked “181A-P” for pressure-sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape. Tapes and mastics ~~Closure systems~~ used to seal flexible air ducts and flexible air	

AMENDED IRC-2012	IRC-2015	IRC-2018
	connectors shall comply with UL 18IB and shall be marked "181B-FX" for pressure-sensitive tape or "181BM" for mastic. Duct connections to flanges of air distribution system equipment shall be sealed and mechanically fastened. Mechanical fasteners for use with flexible nonmetallic air ducts shall comply with UL 18IB and shall be marked 181B-C. Crimp joints for round metallic ducts shall have a contact lap of not less than 1 inch (25.4 mm) and shall be mechanically fastened by means of not less than three sheet-metal screws or rivets equally spaced around the joint. Closure systems used to seal <u>all</u> ~~metal~~ ductwork shall be installed in accordance with the manufacturer's instructions. ~~Round metallic ducts shall be mechanically fastened by means of at least three sheet metal screws or rivets spaced equally around the joint. Unlisted duct tape shall not be permitted as a sealant on any duct.~~ Exceptions: 1. Spray polyurethane foam shall be permitted to be applied without additional joint seals. 2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the	

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	exposed portion of the joint so as to prevent a hinge effect. 3. <u>For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams of other than the snap-lock and button-lock types.</u> ~~Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.~~	
	<u>M1601.4.2 Duct lap.</u> <u>New section.</u>	
	M1604.4 ~~M1601.4.3~~ Support. <u>Flexible-made ducts listed in accordance with UL 181 shall be supported in accordance with the manufacturer's installation instructions. Field- and Shop-fabricated fibrous glass ducts shall be supported in accordance with the SMACB+NA Fibrous Glass Duct Construction Standards or the NAIMA Fibrous Glass Duct Construction Standards. Field- and shop-fabricated metal and flexible ducts shall be supported in accordance with the SMACNA HVAC Duct Construction Standards- Metal and Flexible.</u> ~~Metal~~	

AMENDED IRC-2012	IRC-2015	IRC-2018
	~~ducts shall be supported by '/2-inch-wide (13-mm) 18-gage metal straps or 12-gage galvanized wire at intervals not exceeding 10 feet (3048 mm) or other approved means. Nonmetallic ducts shall be supported in accordance with the manufacturer's installation instructions.~~	
	M1602.1 Outdoor air openings. New section inserted.	
	M1602.2 Return air openings. New section inserted.	**M1602.2 Return air openings.** Insert- 5. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified.
	CHAPTER 18 CHIMNEYS AND VENTS	
	M1804.4 Door swing. New section.	
	CHAPTER 19 SPECIAL APPLIANCES, EQUIPMENT AND SYSTEMS	
		M1901.1 Clearances. Freestanding or built-in ranges shall have a vertical clearance above the cooking top of not less than 30 inches (762 mm) to unprotected combustible material. Reduced clearances are permitted in accordance with the listing and labeling of the range hoods or ovens with integral exhaust. ~~appliances. The installation of the listed and labeled cooking appliance or microwave oven over a listed and labeled cooking appliance shall be in accordance with Section M1504.1. The clearances for a domestic~~

AMENDED IRC-2012	IRC-2015	IRC-2018
		~~open-top broiler unit shall be in accordance with Section M1504.1.~~
		M1901.2 Cooking appliances. Cooking appliances shall be listed and labeled for household use and shall be installed in accordance with the manufacturer's instructions. The installation shall not interfere with combustion air or access for operation and service. Electric cooking appliances shall comply with UL 1026 or UL 858. Solid-fuel-fired fireplace stoves shall comply with UL 737. Microwave ovens shall comply with UL 923.
Section M1901.3 Prohibited location. Cooking appliances designed, tested, listed and labeled for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur. Unless approved by the Building Official.	**~~M1901.3 Prohibited location. Cooking appliances designed. Tested, listed and labeled for use in commercial occupancies shall not be installed within dwelling units or within any area where domestic cooking operations occur.~~** Deleted.	
	CHAPTER 20 BOILERS AND WATER HEATERS	**CHAPTER 20 BOILERS AND HEATERS**
	M2001.1.1 Standards. Packaged oil-fired boilers ~~and their control systems~~ shall be listed and labeled in accordance with UL 726. Packaged electric boilers ~~and their control systems~~ shall be listed in accordance with UL 834. Solid-fuel-fired boilers shall be listed and labeled in accordance with UL 2523. Boilers shall be designed, ~~and~~ constructed and certified in	

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	accordance with the requirements of ~~ASME CSD-1 and as applicable,~~ the ASME Boiler and Pressure Vessel Code, Sections I and IV. Controls and safety devices for boilers with the fuel input ratings of 12,500,000 BTU/hr (3 663 388 watts) or less shall meet the requirements of ASME CSD-1. Gas-fired boilers shall conform to the requirements listed in Chapter 24.	
	M2002.5 Boiler low-water cutoff. ~~All~~ Steam and hot water boilers shall be protected with a low-water cutoff control. ~~The low-water cutoff shall automatically stop the combustion operation of the appliance when the water level drops below the lowest safe water level as established by the manufacturer.~~ **Exception:** A low-water cutoff is not required for coil-type and water-tube type boilers that require forced circulation of water through the boiler and that are protected with a flow sensing control.	
	M2002.6 Operation. New section.	
		M2006.1 General. **Exception:** Portable residential spas and portable residential exercise spas shall comply with UL 1563 or SCA C22.2 No. 218.1.
	CHAPTER 21 HYDRONIC PIPING	**CHAPTER 21 HYDRONIC PIPING**

AMENDED IRC-2012	IRC-2015	IRC-2018
	M2101.10 Tests. Hydronic piping shall be tested hydrostatically at a pressure of one and one-half times the maximum system design pressure, but not less than 100 pounds per square inch (690 kPa). The duration of each test shall be ~~for a duration of~~ not less than 15 minutes and not more than 20 minutes.	**M2101.10 Tests.** **Exception:** For PEX piping systems, testing with a compressed gas shall be an alternative to hydrostatic testing where compressed air or other gas pressure testing is specifically authorized by all of the manufacturer's instructions for the PEX pipe and fittings products installed at the time the system is being tested, and compressed air or other gas testing is not otherwise prohibited by applicable codes, laws or regulations outside of this code.
	TABLE M2101.1 HYDRONIC PIPING MATERIALS. Revised.	
		M2103.2 Thermal barrier required. Radiant floor heating systems shall have a thermal barrier in accordance with Sections M2103.2.1 and M2103.2.2. Insulation R-values for slab-on-grade and suspended floor installations shall be in accordance with Chapter 11.
	M2103.3 Piping joints. Copper and copper alloy systems shall be soldered in accordance with ASTM B 828. Fluxes for soldering shall be in accordance with ASTM B 813. Brazing fluxes shall be in accordance with AWS A5.31. Piping joints that are embedded shall be installed in accordance with the following requirements: 6. Steel pipe joints shall be welded. Revise- 2. Copper tubing shall be joined with brazing complying with Section	**M2103.3 Piping joints**. Copper and copper alloy systems shall be soldered, brazed, or press connected ~~in accordance with ASTM B 828~~. Fluxes for soldering shall be in accordance with ASTM B 813. Brazing fluxes shall be in accordance with AWS A5.31. Press-connected joints shall be in accordance with ASME B16.51. Piping joints that are embedded shall be installed in accordance with the following requirements:

AMENDED IRC-2012	IRC-2015	IRC-2018
	P3003.6.1 ~~material having a melting point exceeding 1,000°F(538°C)~~. 3. Polybutylene pipe and tubing joints shall be installed with socket-type heat-fused polybutylene fittings. 4. CPVC tubing shall be joined using solvent cement joints. 5. Polypropylene pipe and tubing joints shall be installed with socket-type heat-fused polypropylene fittings. 6. Cross-linked polyethylene (PEX) tubing shall be joined using cold expansion, insert or compression fittings. Add- 7. Raised temperature polyethylene (PE-RT) tubing shall be joined using insert or compression fittings.	
	M2104.2 Piping joints. Piping joints, other than those in Section M2103.3. that are embedded shall comply with the following requirements: Add- 4. Raised temperature polyethylene (PE-RT) shall be installed in accordance with the manufacturer's instructions.	
	M2104.3.3 PE-RT insert fittings. New section.	
	SECTION M2105 GROUND-SOURCE HEAT-PUMP SYSTEM LOOP PIPING. Section and subsections rewritten.	
		M2105.13.3 Heat-fusion joints. New section.

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		M2105.13.4 Electro fusion joints. New section.
	CHAPTER 23 THERMAL SOLAR ENERGY SYSTEMS	**CHAPTER 23 SOLAR THERMAL ENERGY SYSTEMS**
	M2301.2 Design and installation. The design and Installation of thermal solar energy systems shall comply with Sections M2301.2.1 through M2301.2.13 ~~M2301.2.1through M2301.2.9~~.	
		M2301.2.1 Access. Access shall be provided to solar energy equipment for maintenance. Solar systems and appurtenances shall not obstruct or interfere with the operation of any doors, windows or other building components requiring operation or access. Roof-mounted solar thermal equipment shall not obstruct or interfere with the operation of roof-mounted equipment, appliances, chimneys, plumbing vents, roof hatches, smoke vents, skylights and other roof penetrations and openings. ~~Solar energy collectors, controls, dampers, fans, blowers and pumps shall be accessible for inspection, maintenance, repair and replacement.~~
	M2301.2.2 Collectors and panels. New section inserted.	
	M2301.2.2.2 Collector sensors. New section inserted.	**M2301.2.2.2 Collector sensors.** Collector sensor installation, sensor location and the protection of exposed sensor wires from degradation ~~ultraviolet light~~ shall be in accordance with ICC 900/SRCC 300.

AMENDED IRC-2012	IRC-2015	IRC-2018
	M2301.2.3 Pressure and temperature relief. System components containing fluids shall be protected with pressure- and temperature-relief valves. Relief devices shall be installed in sections of the system so that a section cannot be valved off or isolated from a relief device. Direct systems and the potable water portion of indirect systems shall be equipped with a relief valve in accordance with Section P2804. For indirect systems, pressure relief valves in solar loops shall comply with SRCC 300. System components shall have a working pressure rating of not less than the setting of the pressure relief device.	
		M2301.2.4 Vacuum relief. System components that might be subjected to a vacuum ~~pressure drops below atmospheric pressure~~ during operation or shutdown shall be protected by a vacuum-relief valve.
	M2301.2.5 Piping insulation. New section inserted.	
		M2301.2.6 Protection from freezing. System components shall be protected from damage resulting from freezing of heat-transfer liquids at the winter design temperature provided in Table R301.2(1). Freeze protection shall be provided in accordance with ICC 900/SRCC 300. Darin-back systems shall be installed in compliance with Section

AMENDED IRC-2012	IRC-2015	IRC-2018
		M2301.2.6.1. Systems utilizing freeze-protection valves shall comply with Section M2301.2.6.2. ~~by heating, insulation, thermal mass and heat transfer fluids with freeze points lower than the winter design temperature, heat tape or other approved methods, or combinations thereof.~~ **Exception:** Where the 97.5percent winter design temperature is greater than or equal to 48^0F (9^0C) ~~32^0F (0^0C)~~.
		M2301.2.6.1 Drain-back systems. New section.
		M2301.2.6.2 Freeze-protection valves. New section.
	M2301.2.7 Storage tank sensors. New section inserted.	
	M2301.2.8 Expansion tanks. Expansion tanks in solar energy systems shall be installed in accordance with Section M2003 in solar collector ~~closed fluid~~ loops that contain pressurized heat transfer fluid. Where expansion tanks are used, the system shall be designed in accordance with SRCC 300 to provide ab expansion tank that is sized to withstand the maximum operating pressure of the system. **Expansion:** Expansion tanks shall not be required in drain-back systems.	**M2301.2.8 Expansion tanks.** Expansion tanks in solar energy systems shall be installed in accordance with Section M2003 in solar collector loops that contain pressurized heat transfer fluid. Where expansion tanks are used, the system shall be designed in accordance with SRCC 300 to provide ab expansion tank that is sized to withstand the maximum operating pressure of the system. **Expansion:** Expansion tanks shall not be required in the collective loop of drain-back systems.
	M2301.2.10 Description and warning labels. New section.	
	M2301.2.11 Solar loop. New section.	

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	M2301.2.11.2 Drain and fill valve labels and caps. New section.	
	M2301.3.1 Collectors. Collectors shall be listed and labeled in accordance with SRCC 100 or SRCC 600. Collectors and panels shall be listed and labeled to show the manufacturer's name, model number, serial number, collector weight, collector maximum allowable temperatures and pressures, and the type of heat transfer fluids that are compatible with the collector or panel. The label shall clarify that these specifications apply only to the collector or panel.	**M2301.3.1 Collectors.** Solar thermal collectors and panels ~~Collectors~~ shall be listed and labeled in accordance with ICC 901/SRCC 100 ~~or SRCC 600~~. Factory-built collectors shall bear a label indicating the ~~Collectors and panels shall be listed and labeled to show the~~ manufacturer's name, model number, serial ~~number, collector weight, collector maximum allowable temperatures and pressures, and the type of heat transfer fluids that are compatible with the collector or panel~~. ~~The label shall clarify that these specifications apply only to the collector or panel.~~
		M2301.3.2 Thermal storage units. Pressurized water ~~thermal~~ storage units shall be listed and labeled to show the manufacturer's name, model number, serial number, storage unit maximum and minimum allowable operating temperatures and pressures, and the type of heat transfer fluids that are compatible with the storage unit. the label shall clarify that these specifications apply only to the thermal storage unit.
	M2301.4 Heat transfer gasses or liquids and heat exchangers. New section.	
	M2301.6 Filtering. New section.	
	M2301.7 Solar thermal systems for heating potable water. New section and subsections.	

AMENDED IRC-2012	IRC-2015	IRC-2018
	CHAPTER 24 FUEL GAS	**CHAPTER 24 FUEL GAS**
Section G2404.1.1 (301.1.2) LP-Gas Installations. Whenever there is a conflict between this code and NFPA 54 and NFPA 58 as adopted by the Nevada LP-Gas Board for LP-Gas installations, the adopted codes of the Nevada LP-Gas Board shall govern.		
Section G2404.11 (301.16) Snow hazard. On any new installation or reconnecting the gas service or an existing installation, gas meters above 5000 feet in elevation in Storey County or 6225 feet in elevation in Carson City or Washoe County must be protected from falling, sliding and accumulating of snow, unless the gas meter is installed in a protected location such as under an engineered deck, roof or shed. Engineered decks, roofs, or sheds shall be enclosed in all sides when used to protect gas meters on the snow shedding sides of a structure as approved by the gas utility.	**G2402.11 (307.6) Condensate pump.** New section**.**	
		G2411.2 (310.2) CSST. New section and subsections**.**
	G2411.1.1.1 (310.1.1.1) Point of connection. New section.	
	G2411.1.1.2 (310.1.1.2) Size and material of jumper. New section.	
	G2411.1.1.3 (310.1.1.3) Bonding jumper length. New section.	
	G2411.1.1.4 (310.1.1.4) Bonding connections. New section.	
	G2411.1.1.5 (310.1.1.5) Connection devices. New section.	

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		G2412.9 (401.9) Identification: **Exceptions:** 1. Steel pipe sections that are 2 feet (610 mm) and less in length and are cut from longer sections of pipe. 2. Steel pipe fittings 2 inches and less in size. 3. Where identification is provided on the product packaging or crating. 4. Where other approved documentation is provided.
		G2412.10 (401.10) Piping materials standards. New section.
		G2413.5 (402.5) Noncorrugated stainless steel tubing. New section.
		2413.7 (402.7) ~~**G2413.6 (402.6)**~~ **Maximum operating pressure.** Insert- 2. The piping joints are flanged and pipe-to-flange connections are made by welding or brazing.
		G2413.7.1 (402.7.1) Operation below -5^{0}F (-21^{0}C). New section.
		G2414.10.3 (403.10.3) Stainless steel tubing joints. New section.
	G2414.10.4 (403.10.4) Metallic fittings. Metallic fittings, including valves, strainers and filters shall comply with the following: Add- 5. Where pipe fittings are drilled and tapped on the field, the operation shall be in accordance with all of the following: 5.1 The operation shall be performed on systems having operating	

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	pressures of 5 psi (34.5 kPa) or less. 5.2 The operation shall be performed by the gas supplier or the gas suppliers designated representative. 5.3 The drilling and tapping operation shall be performed in accordance with written procedures prepared by the gas supplier. 5.4 The fittings shall be located outdoors. 5.5 The tapped fitting assembly shall be inspected and proven to be free of leakage.	
		G2414.4.2 (403.4.2) Steel. Steel stainless steel and wrought-iron pipe shall be not lighter than Schedule 10 and shall comply with the dimensional standards of ASME B36.10, 10M and one of the following standards ~~at least of standard weight (Schedule 40) and shall comply with one of the following standards~~: 1. ASTM A 53/A 53M 2. ASYM A 106 3. ASTM A312
	G2415.5 (404.5) Fittings in concealed locations. New section.	
	G2415.7 (404.7) Protection against physical damage. Where piping will be concealed within light-frame construction	

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	assemblies, the piping shall be protected against penetration by fasteners in accordance with Sections G2415.7.1 through G2415.7.3. Exception: Black steel piping and galvanized steel piping shall not be required to be protected. ~~In concealed locations, where piping other than black or galvanized steel is installed through holes or notches in wood studs, joists, rafters or similar members less than 1'/2 inches (38 mm) from the nearest edge of the member, the pipe shall be protected by shield plates. Protective steel shield plates having a minimum thickness of 0.0575 inch (1.463 mm) (No. 16 Gage) shall cover the area of the pipe where the member is notched or bored and shall extend a minimum of 4 inches (102 mm) above sole plates, below top plates and to each side of a stud, joist or rafter.~~	
	G2415.7.1 (404.7.1) Piping through bored holes or notches. New section.	
	G2415.7.2 (404.7.2) Piping installed in other locations. New section.	
	G2415.7.3 (404.7.3) Shield plates. New section.	
		G2415.11.1 (404.11.1) Galvanizing. New section.

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		G2415.11.2 (404.11.2) Protection methods. New section.
		G2415.11.3 (404.11.3) Dissimilar metals. New section.
		G2415.11.4 (404.11.4) Protection of risers. New section.
Section G2417.4.1 (406.4.1) Test pressure. The test pressure to be used shall be no less than 1-1/2 times the proposed maximum working pressure, but not less than ~~3~~ 25 psig (~~20~~ 172.4 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 test shall be made before any fixtures, appliances or shut-off valves have been attached and before being concealed,		
Section G2417.4.2 (406.4.2) Test duration. Test duration shall not be less than ~~10 minutes~~ 30 minutes.		
Section G2417.6.2 (406.6.2) Turning gas on. During the process of turning gas on into a system of new gas piping or into a system or portion of a gas system that has been restored after an interruption of service, the entire system shall be inspected to determine that there are no open fittings or ends and that all vales at unused outlets are closed and plugged or capped. In the City of Fernley, City of Reno, City of Sparks, Storey		

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County and Washoe County, a manometer test shall be made after all valves, connectors and piping to the appliance are complete. A pressure test shall be made with the use of a manometer gauge measuring inches of water column. With all valves including gas cock and gas control valves in the open position, a pressure of at least eleven (11) to fifteen (15) inches of water column shall be measured for at least fifteen (15) minutes, with no perceptible drop in pressure.		
Section G2417.6.2.1 (405.6.2.1) For medium pressure gas systems. Where the appliance is rated for seven (7) to eleven (11) inches of water column, a manometer test if eleven (11) to fifteen (15) inches of water column will be conducted between the pressure regulating valve and the appliance and shall be measured for at least fifteen (15) minutes with no perceptible drop in pressure.		
Section G2417.6.2.2 (406.2.2) For appliances or equipment requiring pounds of pressure: A pressure test using a pressure gauge measuring in one tenth (1/10) increments shall be conducted on the gas train of that appliance or equipment. The pressure shall be equal to the appliance's normal operating pressure for a period of thirty (30) minutes with no perceptible drop in pressure.		

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Section G2417.6.2.3 (406.2.3) Manometer testing. Manometer testing shall be performed by a person holding a valid Washoe County manometer tester card for which the number is to be provided at the time of request for inspection. A visual manometer test to be witnessed by the authority having jurisdiction may be allowed by the Building Official. A manometer test does not need to be reported when the serving gas utility preforms a manometer or clock test prior to providing service.		
	G2415.18 (404.18) Pipe cleaning. New section.	
		G2420.6 (409.7) Shutoff valves in tubing systems. New section.
	G2421.2 (410.2) MP regulators. MP pressure regulators shall comply with the following: Add- 7. Where connected to rigid piping, a union shall be installed within 1 foot (304 mm) of either side of the MP regulator.	**G2421.2 (410.2) MP regulators**. MP pressure regulators shall comply with the following: Revise 6. A tee fitting with one opening capped or plugged shall be installed not less than 10 pipe diameters downstream of the MP regulator outlet. Such tee fitting shall be positioned to allow connection of a pressure-measuring instrument. The tee fitting is not required where the MP regulator serves an appliance that has a pressure test port n the gas control inlet side and the appliance is located in the same room as the MP regulator.
	G2422.1.5 (411.1.4) Movable appliances. Where appliances are equipped with casters or are otherwise subject to	

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	periodic movement or relocation for purposes such as routine cleaning and maintenance, such appliances shall be connected to the supply system piping by means of an appliance connector listed as complying with ANSI Z21.69 or by means of Item 1 of Section G2422.1. ~~approved flexible connector designed and labeled for the application~~. Such flexible connectors shall be installed and protected against physical damage in accordance with the manufacturer's installation instructions	
	G2426.7.1 (502.7.1) Door swing. New section.	
		G2427.4.1 (503.4.1) Plastic piping. Where plastic piping is used to vent an appliance, the appliance shall be listed for use with such venting materials and the appliance manufacturer's installation instructions shall identify the specific plastic piping material. The plastic pipe venting materials shall be labeled in accordance with the product standards specified by the appliance manufacturer or shall be listed in accordance with UL 1738.
		G2427.4.1.1 (503.4.1.1) Plastic vent joints. Plastic pipe and fittings used to vent appliances shall be installed in accordance with the appliance manufacturer's instructions. Plastic pipe venting materials listed and labeled in accordance with the

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		vent manufacturer's instructions. Where a primer is required, it shall be of a contrasting color.
		G2427.5.10 (503.5.11) Insulation shield. New section.
		G2427.6.1 (503.6.1) Materials. New section.
	G2427.6.8.3 (503.6.9.3) Category II, III and IV appliances. The sizing of gas vents for Category II, Ill and IV appliances shall be in accordance with the appliance manufacturer's instructions. The sizing of plastic pipe that is specified by the appliance manufacturer as a venting material for Category II, III and IV appliances, shall be in accordance with the manufacturer's instructions.	
		G2427.6.9 (503.6.10) Size of gas vents. New section and subsections.
	G2427.8 (503.8) Venting system termination location. Add- 5. Vent systems for Category IV appliances that terminate through an outside wall of a building and discharge flue gases perpendicular to the adjacent wall shall be located not less than 10 feet (3048 mm) horizontally from an operable opening in an adjacent building. This requirement shall not apply to vent terminals that are 2 feet (607mm) or more above or 25 feet (7620 mm) or more below operable openings.	**G2427.8 (503.8) Venting system termination location.** Replace- 3. The clearances for through-the-wall, direct-vent terminals shall be in accordance with Table G2427.8.

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		TABLE G2427.8 (503.8) THROUGH-THE-WALL, DRIECT-VENT TERMINATION CLEARANCES. New table.
		G2439.3.1 (614.4.1) Exhaust termination outlet and passageway. New section.
	G2439.4 (614.5) Dryer exhaust duct power ventilators. New section inserted.	
	G2439.6 (614.7) Protection required. New section.	
	G2439.7 (614.8) Domestic clothes dryer exhaust ducts. New section.	
	G2439.7.1 (614.8.1) Material and size. New section.	
	G2439.7.2 (614.8.2) Duct installation. New section.	
	G2439.7.4.3 (614.8.4.3) Dryer exhaust duct power ventilator length. New section.	
	G2439.7.5 (614.8.5) Length identification. New section.	
	G2447.2 (623.2) Prohibited location. **Exception:** Appliances that are also listed as domestic cooking appliances.	**G2447.2 (623.2) Prohibited location.** **Exceptions:** **1.** Appliances that are also listed as domestic cooking appliances. **2.** Where the installation is designed by a licensed Professional Engineer, in compliance with the manufacturer's installation instructions.

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	CHAPTER 25 PLUMBING ADMINISTRATION	**CHAPTER 25 PLUMBING ADMINSTRATION**
	P2502.1 Existing building sewers and drains. Where the entire sanitary drainage system of an existing building is replaced, existing buildings under concrete slabs and existing building sewers that will serve the new system shall be internally examined to verify that the piping is sloping in the correct direction, is not broken, is not obstructed and is sized for the drainage load of the new plumbing drainage system to be installed. ~~Existing building sewers and drains shall be used in connection with new systems when found by examination and/or test to conform to the requirements prescribed by this document.~~	
Section P2503.5.1 Rough plumbing. DWV systems shall be tested n completion of the rough piping installation by water or ~~for piping systems other than plastic,~~ by air with no evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough piping have been installed, as follows: 1. Water test. Each section shall be filled with water to a point not less than 10 feet (3048 mm) above the highest fitting connection in the section under that section, or to the highest point in the completed		

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system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection. 2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.		
		P2503.7 Water-supply system testing. **Exception.** For PEX piping systems, testing with a compressed gas shall be an alternative to hydrostatic testing where compressed air or other gas pressure testing is specifically authorized by the manufacturer's instructions for the PEX pipe and fittings products installed at the time the system is being tested, and compressed air or other gas testing is not otherwise prohibited by applicable codes, laws or regulations outside of this code.
	CHAPTER 26 GENERAL PLUMBING REQUIREMENTS	**CHAPTER 26 GENERAL PLUMBING REQUIREMENTS**
		P2602.1 General. The water-distribution system of ~~and drainage system or~~ any building or premises where plumbing fixtures are installed shall be connected to a public water supply. ~~or sewer system, respectively, if available.~~ Where either a public water-supply ~~or sewer~~ system~~, or both, are~~ is

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		not available, or connection to them is not feasible, an individual water supply ~~or individual (private) sewage disposal system, or both,~~ shall be provided. Individual water supplies shall be constructed and installed in accordance with the applicable state and local laws. Where no such laws do not address the requirements set forth in NGWA-01, individual water supplies shall comply with NGWA-01 for those requirements not addressed by state and local laws. Sanitary drainage piping from plumbing fixtures in buildings and sanitary drainage piping systems from premises shall be connected to a public sewer. Where a public sewer is not available, the sanitary drainage piping and systems shall be connected to a private sewage disposal system in compliance with state or local requirements. Where state or local requirements do not exist for private sewage disposal systems, the sanitary drainage piping and systems shall be connected to an approved private sewage disposal system that is in accordance with the International Private Sewage Disposal Code. **Exception:** Sanitary drainage piping and systems that convey only the discharge from bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to connect to a public sewer or to a private sewage disposal system provided that the piping or systems are connected to a system in accordance with Section P2910 or P2911.

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	P2603.2.1 Protection against physical damage. In concealed locations, where piping, other than cast-iron or galvanized steel, is installed through holes or notches in studs, joists, rafters or similar members less than 1 ¼ ~~l'/2~~ inches (31.8 ~~38~~ mm) from the nearest edge of the member, the pipe shall be protected by steel shield plates. Such shield plates shall have a thickness of not less than 0.0575 inch (1.463 mm) (No. 16 Gage). Such plates shall cover the area of the pipe where the member is notched or bored, and shall extend not less than 2 inches (51 mm) above sole plates and below top plates.	
	P2603.3 Protection against corrosion. New section.	
Section P2603.5.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall be ~~a~~ not less than twelve (12) inches (305 mm) below finished grade at the point of septic tank connection. Building sewers shall be not less than twelve (12) inches (305 mm) below grade.		
	P2604.2 Water service and building sewer in same trench ~~Common trench.~~ ~~See Section P2905.4.2.~~ Where the water service piping and building sewer piping is installed in the same trench, the	

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	installation shall be in accordance with Section P2906.4.1.	
		P2605.1 General. Insert- 4. Where horizontal pipes 4 inches (102 mm) and larger convey drainage or waste, and where a pipe fitting changes the flow direction greater than 45 degrees (0.79 rad), rigid bracing or other rigid support arrangements shall be installed to resist movement of the upstream pipe in the direction of flow. A change of flow direction into a vertical pipe shall not require the upstream pipe to be braced.
	P2607.1 Pipes penetrating roofs. New section**.**	
	P2607.2Pipes penetrating exterior walls. New section**.**	
	P2609.1 Identification. Each length of pipe and each pipe fitting, trap, fixture, material and device utilized in a plumbing system shall bear the identification of the manufacturer and any markings required by the applicable referenced standards. Nipples created from the cutting and threading of approved pipe shall not be required to be identified. **Exceptions:** Where the manufacturer identification cannot be marked on pipe fittings and pipe nipples because of the small size of such fittings, the identification shall be printed on the item	

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	packaging or on documentation provided with the item.	
	CHAPTER 27 PLUMBING FIXTURES	
	P2702.1 Plumbing fixtures. Plumbing fixtures, other than water closets, shall be provided with approved strainers**.** **Exception:** Hub drains receiving only clear water waste and standpipes shall not require strainers**.**	
	P2706.1.2.1 Laundry tray connection to standpipe. New section.	
	P2708.2 Shower drain. New section**.**	
	P2711.1 Approval. Lavatories shall conform to ASME A112.19.1/CSA, B45.2, ASME A112.19.2/CSA B45.1, ASEM A112.19.3/CSA B45.4 or CSA B45.5/IAPMO X124. ~~ANSI Z124.3. ASME I 12.19.1/CSA B45.2. ASME A 1 12.19.2/ CSA B45.1or ASME A112.19.3/CSA B45.4.~~	
	P2711.2 Cultured marble lavatories. Cultured marble vanity tops with an integral lavatory shall conform to ~~ANSI Z 124.3 or~~ CSA B45.5/1APMOZ124.	
	P2712.1 Approval. Water closets shall conform to the water consumption requirements of Section P2903.2 and shall conform to ASME A112.19.2/CSA B45.1, ASME A112.19.3/CSA B45.4 or CSA B45.5/IAPMO Z124. ~~ANSI Z124.4. ASME Al~~	

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	~~12.19.2/CSA B45.1. ASME A112.19.3/CSA B45.4 or CSA B45.5.~~ Water closets shall | conform to the hydraulic performance requirements of ASME Al 12.19.2/CSA B45.L Water closet tanks shall con- I form to ANSI Z124.4. ASME Al 12.19.2/CSA B45.L ASME I A 112.19.3/CSA B45.4 or CSA B45.5. Water closets that | have an invisible seal and unventilated space or walls that are not thoroughly washed at each discharge shall be prohibited. Water closets that permit backflow of the contents of the bowl into the flush tank shall be prohibited. Water closets equipped either a dual flushing device shall comply with ASME A112.19.14.	
	P2716.1 Food waste grinder disposal waste outlets. Food waste grinders shall be connected to a drain of not less than l'/2 inches (38 mm) in diameter.	
	P2716.2 Water supply required. A sink equipped with a food-waste disposer shall be provided with a faucet. ~~Food waste grinders shall be provided with an adequate supply of water at a sufficient flow rate to ensure proper functioning of the unit.~~	
	P2717.1 Protection of water supply. The water supply to a ~~for~~ dishwasher~~s~~ shall be protected against backflow by an air gap	

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	complying with ASME A112.1.3 or A112.1.2 that is installed integrally within the machine or a backflow preventer in accordance with Section P2902 ~~or integral backflow preventer.~~	
	P2725.1 General. New section.	
	CHAPTER 28 WATER HEATERS	
	P2801.2 Drain valves. New section.	
	P2801.5.1 Pan size and drain. The pan shall be not less than l'/2 inches (38 mm) deep and shall be of sufficient size and shape to receive all dripping or condensate from the tank or water heater. The pan shall be drained by an indirect waste pipe of not less than 3/4 inch (19 mm) diameter. Piping for safety pan drains shall be of those materials listed in Table P2905.5. Where a pan drain was not previously installed, a pan drain shall not be required for a replacement water heater installation.	
	SECTION P2802 SOLAR WATER HEATING SYSTEMS. New sections and subsections inserted.	
	P2803.6.1 Requirements for discharge pipe. The dis¬ charge piping serving a pressure-relief valve, temperature relief valve or combination valve shall:	

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	Revise- 10. Terminate not more than 6 inches (152 mm) and not less than two times the discharge pipe diameter above the floor or waste receptor flood level rim. ~~Not terminate more than 6 inches (152 mm) above the floor or waste receptor.~~ Add- 14. Be one nominal size larger than the size of the relief-valve outlet, where the relief-valve discharge piping is constructed of PEX or PE-RT tubing. The outlet end of such tubing shall be fastened in place.	
	CHAPTER 29 WATER SUPPLY AND DISTRIBUTION	
	P2901.2 Identification of nonpotable water systems. New section and subsections.	
	TABLE P2901.2.2 SIZE OF PIPE IDENTIFICATION. New table.	
	P2902.3.2 Atmospheric-type vacuum breakers. ~~Pipe applied~~ Atmospheric-type vacuum breakers shall conform to ASSE 1001 or CSA B64.1.1. Hose-connection vacuum breakers shall conform to ASSE 1011, ASSE 1019, ASSE 1035, ASSE 1052, CSA B64.2, CSA B64.2.1. CSA B64.2.1.1, CSA B64.2.2 or CSA B64.7. Both types of vacuum breakers shall be installed with the outlet continuously open to the atmosphere. The critical level of	

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	atmospheric vacuum breaker shall be set at not less than6 inches (152 mm) above the highest elevation of downstream piping and the flood level rim of the fixture or device. ~~These devices shall operate under normal atmospheric pressure when the critical level is installed at the required height~~.	
	P2902.3.3 Backflow preventer with intermediate atmospheric vent. Backflow preventers with intermediate atmospheric vents shall conform to ASSE 1012 or CAN/ CSA B64.3. These devices shall be permitted to be installed where subject to continuous pressure conditions. These devices shall be prohibited as a means of protection where any hazardous chemical additives are introduced downstream of the device. The relief opening shall discharge by air gap and shall be prevented from being submerged.	
	P2902.3.4 Pressure vacuum breaker assemblies. Pressure vacuum breaker assemblies shall conform to ASSE 1020 or CSA B64.1.2. Spill-resistant vacuum breaker assemblies shall comply with ASSE 1056. These assemblies are designed for installation under continuous pressure conditions where the critical level is installed at the required height. The	

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	critical level of a pressure vacuum breaker shall be set at not less than 12 inches (304 mm) above the highest elevation of downstream piping and flood level rim of the fixture or device. Pressure vacuum breaker assemblies shall not be installed in locations where spillage could cause damage to the structure.	
	P2902.3.6 Double check-valve assemblies. Double check-valve assemblies shall conform to ASSE 1015, CSA B64.5, CSA B64.5.1 or AWWA C510. Double check detector fire protection backflow prevention assemblies shall conform to ASSE 1048. ~~Double detector check-valve assemblies shall conform to ASSE 1048.~~ These devices shall be capable of operating under continuous pressure conditions	
	P2902.3.7 Dual check backflow preventer. New section.	
	P2902.5.2 Heat exchangers. Heat exchangers using an essentially toxic transfer fluid shall be separated from the potable water by double-wall construction. An air gap open to the atmosphere shall be provided between the two walls. Single-wall construction heat exchangers shall be used only where an essentially nontoxic transfer fluid is	

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	utilized. ~~Heat exchangers utilizing an essentially nontoxic transfer fluid shall be permitted to be of single-wall construction.~~	
	P2902.5.5 Solar thermal systems. Revised ~~The potable water supply to a solar system shall be equipped with a backflow preventer with intermediate atmospheric vent complying with ASSE 1012 or a reduced pressure principle backflow preventer complying with ASSE 1013. Where chemicals are used, the potable water supply shall be protected by a reduced pressure principle backflow preventer. Exception: Where all solar system piping is a part of the potable water distribution system, in accordance with the requirements of the International Plumbing Code, and all components of the piping system are listed for potable water use, cross-connection protection measures shall not be required~~.	
	P2902.5.5.1 Indirect systems. New section.	
	P2902.5.5.2 Direct systems for potable water distribution systems. New section.	
	P2902.5.5.2 Direct systems for other than potable water distribution systems. New section.	

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	P2903.3 Minimum pressure. Where the water pressure supplied by the public water main or an individual water supply system is insufficient to provide for the minimum pressures and quantities for the plumbing fixtures in the building, the pressure hall be increased by means of an elevated water tank, a hydropnuematic pressure booster system or a water pressure booster pump. ~~The static water pressure (as determined by the local water authority) at the building entrance for either public or private water service shall be not less than 40 psi (276 kPa).~~	
	P2903.8 Gridded and parallel water distribution system manifolds. Hot water and cold water manifolds installed with ~~gridded or~~ parallel-connected individual distribution lines and cold water manifolds installed in gridded distribution lines to each fixture or fixture fittings shall be designed in accordance with Sections P2903.8.1through P2903.8.5 ~~P2903.8.6~~. Gridded systems for hot water distribution systems shall be prohibited.	
	TABLE P2903.9.4 VALVES. New table.	
	P2903.11 Drain water heat recovery units. New section.	
	P2904.3 Sprinkler piping system.	

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	Exception: For plastic piping, it shall be permissible to follow the manufacturer's installation instructions.	
	SECTION P2905 HEATED WATER DISTRIBUTION SYSTEMS. New sections inserted.	
	SECTION P2906 ~~P2905~~ MATERIALS, JOINTS AND CONNECTIONS. Renumbered**.**	
	P2906.2.1 Lead content of drinking water pipe and fittings. New section**.**	
	P2906.4.1 Separation of water service and building sewer. New section**.**	
	P2906.9.1.3 CPVC/AL/CPVC pipe. New section**.**	
	P2906.18 Press-connect joints. Press-connect joints shall conform to one of the standards indicated in Table P2906.6. Press-type mechanical joints in copper tubing shall be made in accordance with the manufacturer's instructions. Cut tube ends shall be reamed to the full inside diameter of the tube end. Joint surfaces shall be cleaned. The tube shall be fully inserted into the press connect fitting. Press-connect joints shall be pressed with a tool certified by the manufacturer. ~~using approved tools which affix the copper fitting with integral O-ring to the tubing.~~	

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	SECTION P2910 NONPOTABLE WATER SYSTEMS. New sections and subsections.	
	SECTION P2911 ON-SITE NONPOTABLE WATER REUSE SYSTEMS. New sections and subsections.	
	SECTION P2912 NONPOTABLE RAINWATER COLLECTORS AND DISTRIBUTION SYSTEMS. New sections and subsections.	
	SECTION P2913 RECLAIMED WATER SYSTEMS. New sections and subsections.	
	CHAPTER 30 SANITARY DRAINAGE	**CHAPTER 30 SANITARY DRAINAGE**
Section P3002.2 Building sewer. Building sewer piping shall be as shown in Table P3002.2. Forced main sewer piping shall conform to one of the standards for ABS plastic pipe, copper or copper-alloy tubing, PVC plastic pipe or pressure-rated pipe listed in Table P3002.2.		
	P3002.2.1 Building sewer pipe near the water service. New section**.**	
	P3003.1.4.2 Solvent cementing. **Exceptions:** A primer shall not be required where all of the following conditions apply: 1. The solvent cement used is third-party certified as conforming to ASTM D 2564. **2.** The solvent cement is used only for joining PVC drain, waste and	

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	vent pipe and fittings in non-pressure applications in non-pressure applications in sizes up to and including 4 inches (102 mm) in diameter.	
Section P3004.1 DWV system load. The load n DWV-system piping shall be computed in terms if drainage fixture unit (dfu) values in accordance with Table P3004.1. Minimum building sewer size shall be four (4) inches in **diameter**.		
		P3005.1.6 Drainage piping size reduction in the direction of flow ~~Change in size~~. The size of the drainage piping shall not be reduced in size in the direction of the flow. The following shall not be considered a reduction in size in the direction of flow: 1. A 4-inch by 3-inch (102 mm by 76 mm) water closet flange. ~~connection shall not be considered as a reduction in size.~~ 2. A water closet bend fitting having a 4-inch (102 mm) inlet and a 3-inch (76 mm) outlet provided that the 4-inch leg of the fitting is upright and below, but not necessarily directly connected to, the water closet flange. 3. An offset closet flange.
	P3005.2 Cleanouts required. New sections and subsections.	
	P3008.1 Sewage backflow.	

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	Exception: In existing buildings, fixtures above the elevation of the manhole cover of the next upstream manhole in the public sewer shall not be prohibited from discharging through a backwater valve.	
	SECTION P3009 SUSYRFACE LANSCAPE IRRIGATION SYSTEMS. New sections and subsections.	
	SECTION P3010 REPLACEMENT OF UNDERGROUND SEWERS BY PIPE BURSTING METHODS. New sections and subsections.	
		SECTION 3011 REPLACEMENT OF UNDERGROUND SEWERS BY PVC FOLD AND FORM METHODS. New section.
	CHAPTER 31 VENTS	**CHAPTER 31 VENTS**
		P3103.1 Vent pipes terminating outdoors. New section and subsections.
		P3111.1 Type of fixtures. A combination waste and vent system shall not serve fixtures other than floor drains, sinks, lavatories and drinking fountains. A combination waste and vent system shall be considered to be the vent for those fixtures. The developed length of a fixture drain to the combination waste and vent system piping shall not exceed the limitations of Table P3105.1. ~~not receive the discharge of a food waste disposer.~~
		P3111.1 Single-fixture systems. New section.
	CHAPTER 32 TRAPS	

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	P3201.2 Trap seals. New section and subsections.	
	P3201.4 Building traps. Building traps shall be prohibited ~~not be installed, except in special cases where sewer gases are extremely corrosive or noxious, as directed by the budding official~~.	
	CHAPTER 34 GENERAL REQUIREMENTS	**CHAPTER 34 GENERAL REQUIREMENTS**
	E3404.12 Field-applied hazard markings. New section.	
		E3405.2 Working clearances for energized equipment and panelboards. Add- Where such equipment is required by installation instructions or function is located in a space with limited access, all of the following shall apply: 1. Where the equipment is installed above a lay-in ceiling, there shall be an opening not smaller than 22 inches by 22 inches (559 mm by 559 mm), or in a crawl space, there shall be an accessible opening not smaller than 22 inches by 30 inches (559 mm by 762 mm). 2. The width of the working space shall be the width of the equipment enclosure or not less than 30 inches (762 mm), whichever is greater. 3. Enclosure doors and hinged panels shall be capable of opening not less than 90 degrees.

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		4. The space in front of the enclosure shall comply with the depth requirements of Table 110.26(a)(1) of NFPA 70. The maximum height of the working space shall be the height necessary to install the equipment in the limited space. A horizontal ceiling structural member or access panel shall be permitted in the space. [110.26(A)(1), (2), (3), (4)]
	E3405.4 Outdoor dedicated panelboard space. New section.	
		E3406.12 Installation. New section.
	E3406.13 Connection of grounding and bonding equipment. New section and subsections.	
	CHAPTER 36 SERVICES	**CHAPTER 36 SERVICES**
Section E3601.6.2 Service disconnect location. The service disconnecting means shall be installed at a readily accessible location either outside of as building or structure ~~inside~~ nearest the point of entrance of the service conductors. ~~Service disconnecting means shall not be installed in bathrooms. Each occupant shall have a access to the disconnect serving the dwelling unit in which they reside.~~ The disconnecting means may be located independent of the building or structure served in direct line of sight, but nor to exceed thirty (30) feet.		

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Exception: The service disconnecting means may be installed within a building when an external remote shunt trip switch is provided. All shunt trip switches shall be located at seven feet (7') above finish grade at a location approved by the fire department. All shunt trip switches shall be located within a twelve inch (12") equilateral triangle, red in color		
	E3603.1 Grounded and ungrounded service conductor size. Service and feeder conductors supplied by a single-phase, 120/240-volt system shall be sized in accordance with Sections E3603.1.1 through E3603.1.4 and Table 3705.1. Conductors used as ungrounded service entrance conductors, service lateral conductors, and feeder conductors that serve as the main power feeder to a dwelling unit shall be those listed in Table E3603.1. The main power feeder shall be the feeder(s) between the main disconnect and the panelboard that supplies, either by branch circuits or by feeders, or both, all loads that are part of or are associated with the dwelling unit. The feeder conductors to a dwelling unit shall not be required to have an allowable ampacity greater than that of the service-entrance conductors that supply them. Ungrounded service conductors shall have	

AMENDED IRC-2012	IRC-2015	IRC-2018
	a minimum size in accordance with Table E3603.1. The grounded conductor ampacity shall be not less than the maximum unbalance of the load and its size shall be not smaller than the required minimum grounding electrode conductor size specified in Table E3603.1.	
	3603.1.1 Underground service conductors. New section.	
	3603.1.2 Underground feeder conductors. New section.	
	3603.1.3 Feeder size relative to service size. New section.	
	3603.1.4 Grounded conductors. New section.	
		E3603.1.5 Adjustment/correction factors. New section**.**
		E3603.3.3 Location. The service overcurrent device shall be an integral part of the service disconnecting means or shall be located immediately adjacent thereto. Where fuses are used as the service overcurrent device, the disconnecting means shall be located in the supply side of the fuses (230.91)
	E3604.5 Service masts as supports. ~~Where~~ A service mast ~~is~~ used for the support of service-drop conductor~~s~~ or overhead service conductor shall comply with Sections E3604.5.1 and E3604.5.2. ~~, it shall be of adequate strength or be supported by braces or guys to withstand~~	

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	~~the strain imposed by the service drop. Where raceway type service masts are used, all equipment shall be approved.~~ Only power service drop conductors shall be permitted to be attached to a service mast	
	E3604.5.1 Strength. New section.	
	E3604.5.2 Attachment. New section.	
		E3604.6 Supports over buildings. Service conductors passing over a roof shall be securely supported by a substantial structure. For a grounded system, where the substantial structure is metal, is shall be bonded by means of a bonding jumper and listed connector to the grounded overhead service conductor. Where practicable, such supports shall be independent of the building. (230.39)
		E3606.4 Marking. **Exception:** Meter sockets supplied by and under the exclusive control of an electric utility shall not be required to be listed. (230.66 Exception)
		E3608.7 Pool, spa and hot tub structures and structural reinforcing streel. New section.
		E3609.3.1 Intersystem bonding termination device. New section.
		E3609.3.2. New section.
		E3611.5 Rebar type concrete-encased electrode. New section.
	CHAPTER 37 BRANCH CIRCUIT AND FEEDER REQUIREMENTS	**CHAPTER 37 BRANCH CIRCUIT AND FEEDER REQUIREMENTS**

AMENDED IRC-2012	IRC-2015	IRC-2018
		E3701.3 Selection of ampacity. **Exception:** Where two different ampacities apply to ~~adjacent~~ portions of a circuit, the higher ampacity shall be permitted to be used <u>where the total portion(s) of the circuit with the lower ampacity does not exceed the lesser of</u> ~~beyond the point of transition, a distance equal to~~ 10 feet (3048 mm) or 10 percent of the <u>total</u> circuit ~~length figured at the higher ampacity, whichever is less~~. [310.15(A)(2)Exception]
	E3701.5.2 Grouping. The ungrounded and grounded circuit conductors of each multiwire branch circuit shall be grouped by cable ties or similar means in at least one location within the panelboard or other point of origination. **Exception:** Grouping shall not be required where the circuit conductors enter from a cable or raceway unique to the circuit, thereby making the grouping obvious<u>, or where the conductors are identified at their terminations with numbered wire markers corresponding to their appropriate circuit number [210.4(D)Exception].</u>	
	<u>**E3702.13 Electric vehicle branch circuit.** New section inserted.</u>	
		<u>**E703.5 Garage branch circuits.** New section.</u>
	<u>**E3705.4.5 Conductors of Type SE cable.** New section.</u>	

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Section E3705.6.1 Edison Fuses. Plug fuses if he Edisonbased shall be used only for replacement in existing installations where there is no evidence of overfusing or tampering. In any existing building where alterations or additions are made to any of the premises wiring, all fuse holders shall be made to comply with the requirements for a Type S fuse holder through the installation of a tamper proof (rejection type) base.		
		CHAPTER 38 WIRING METHODS
		E3802.6 Cable-securing means. New section.
	CHAPTER 39 POWER AND LIGHTING DISTRIBUTION	**CHAPTER 39 POWER AND LIGHTING DISTRIBUTION**
	E3901.9 Basements, garages and accessory buildings. Not less than one receptacle outlet, in addition to any provided for specific equipment, shall be installed in each separate unfinished portion of a basement, in each attached garage, and in each detached garage or accessory building that is provided with electrical power. the branch circuit supplying the receptacle(s) in a garage sg=hall not supply outlets outside of the garage and not less than one receptacle outlet shall be installed for each motor vehicle space. [210.52(G)(1), (2), and (3)]. ~~At least one receptacle outlet, in addition~~	

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	~~to any provided for specific equipment, shall be installed in each basement and in each attached garage, and in each detached garage or accessory building that is provided with electrical power. Where a portion of the basement is finished into one or more habitable room(s), each separate unfinished portion shall have a receptacle outlet installed in accordance with this section.~~	
	E3902.5 Unfinished basement receptacles. **Exception**: A receptacle supplying only a permanently installed fire alarm or burglar alarm system. Receptacles installed in accordance with this exception shall not be considered as meeting the requirement of Section E3901.0. [210.8(A)(6)]	
	E3902.8 Bathroom or shower stall receptacles. New section.	
	E3902.9 Laundry areas. New section.	
	E3902.10 Kitchen dishwasher branch circuit. New section.	
~~**Section E3902.12 Arc-fault circuit interrupter protection for branch circuit extensions or modifications.** Where branch circuit wiring is modified, replaced or extended in any of the areas specified in Section E3905.12, the branch circuit shall be protected by one of the following:~~		

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~~1. A combination type AFCI located at the origin of the branch circuit.~~ 2. ~~An outlet branch circuit type AFCI located at the first receptacle out of the existing branch circuit.~~		
	E3902.15 Location of arc-fault circuit interrupters. New section.	
	E3902.16 Arc-fault circuit-interrupter protection. New section and subsections.	
	E3905.ll Damp or wet locations. In damp or wet locations, boxes, conduit bodies and fittings shall be placed or equipped so as to prevent moisture from entering or accumulating within the box, conduit body or fitting. Boxes, conduit bodies and fittings installed in wet locations shall be listed for use in wet locations. Where drainage openings are installed in the field in boxes or conduit bodies listed for use in damp or wet locations, such openings shall be approved and not larger than ¼ inch (6.4 mm). For listed drain fittings, larger openings are permitted where installed in the field in accordance with the manufacturer's instructions. (314.15)	
		E3905.12.1 Box volume calculations. The volume of a wiring enclosure (box) shall be the total volume of the assembled sections, and, where used, the space provided by plaster rings, domed covers, extension rings, etc., that are marked with their volume in cubic inches or are made from boxes the dimensions

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		of which are listed in Table E3905.12.1. Where a box is provided with one or more securely installed barriers, the volume shall be apportioned to each of the resulting spaces. Each barrier, if not marked with its volume, shall be considered to take up to .5 cubic inch (8.2 cm^3) if metal, and 1.0 cubic inch (16.4 cm^3) if nonmetallic [314.16(A)]
	E3905.12.2.2 Clamp fill. Where one or more internal cable clamps, whether factory or field supplied, are present in the box, a single volume allowance in accordance with Table E3905.12.2.1shall be made based on the largest conductor present in the box. No allowance shall be required for a cable connector with its clamping mechanism outside the box. A clamp assembly that incorporates a cable termination for the cable conductors shall be listed and marked for use with specific nonmetallic boxes. Conductors that originate within the clamp assembly shall be included in conductor fill calculations provided in Section E3905.12.2.1 as though they entered from outside of the box. The clamp assembly shall not require a fill allowance, but, the volume of the portion of the assembly that remains within the box after installation shall be excluded from the box volume as marked	

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	in accordance with Section E3905.12.1.2 [314.16(B)(2)]	
		E3906.5 Flush-mounted installations. New section inserted.
	E3906.9 Covers and canopies. Outlet boxes shall be effectively closed with a cover, faceplate or fixture canopy. Screws used for the purpose of attaching covers, or other equipment to the box shall be machine screws matching the thread gauge or size that is integral to the box or shall be in accordance with the manufacturer's instructions. (314.25)	
		E3906.12 Separable attachment fittings. New section inserted.
		E3907.1.1 Power monitoring equipment. New section**.**
	E3907.9 Wire-bending space within an enclosure containing a panelboard. New section and subsections inserted.	
	TABLE E3907.9.1(1) [Table 312.6(B)] MINIMUM WIRE-BENDING SPACE AT TERMINALS. New table.	
	TABLE E3907.9.1(2) [Table 312.6(A)] MINIMUM WIRE-BENDING SPACE AT TERMINALS AND WIDTH OF WIRING GUTTERS. New table.	
	E3908.15 Metal boxes. Revise- 2. Machine screw-type fasteners that are secured with a nut.	

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Section E3908.18 Bonding other enclosures. Metal raceways, cable armor, cable sheath, enclosures, frames, fittings and other metal noncurrent-carrying parts that serve as grounding conductors, with or without the use of supplementary equipment grounding conductors, shall be effectively bonded where necessary to ensure electrical continuity and the capacity to conduct safely any fault current likely to be imposed on them. Any nonconductive paint, enamel and similar coating shall be removed at threads, contact points and contact surfaces, or connections shall be made by means of fittings designed so as to make such removal unnecessary. The Authority Having Jurisdiction shall require a supplementary grounding conductor where a metallic raceway is subject to damage or is likely to be disturbed. FON: An example of "subject to damage" might be a surface mounted conduit along a traffic path in a warehouse. An example of "likely o]to be disturbed" night be conduit across a rooftop, where re-roofing operations will require the conduit to be removed.		
	CHAPTER 40 DEVICES AND LUMINAIRES	**CHAPTER 40 DEVICES AND LUMINAIRES**
	E4001.6 Access. **Exception**: This section shall not apply to switches and circuit breakers that are accessible by portable means and are	

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	installed adjacent to the motors, appliances and other equipment that they supply. [404.8(A) Exception]	
	E4001.10 Box mounted. Flush-type snap switches mounted in boxes that are recessed from the finished wall surfaces as covered in Section E3906.5 shall be installed so that the extension plaster ears are seated against the surface of the wall. Flush-type snap switches mounted in boxes that are flush with the finished wall surface or project therefrom shall be installed so that the mounting yoke or strap of the switch is seated against the box. Screws used for the purpose of attaching a snap switch to a box shall be of the type provided with a listed snap switch, or shall be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with the manufacturer's instructions. [404.10(B)]	
	E4001.15 Switches controlling lighting loads. The grounded circuit conductor for the controlled lighting circuit shall be provide at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit for other than the following:	**E4001.15 Switches controlling lighting loads**. The grounded circuit conductor for the controlled lighting circuit shall be installed ~~provide~~ at the location where switches control lighting loads that are supplied by a grounded general-purpose branch circuit serving bathrooms, hallways, stairways, or rooms suitable for human habitation or occupancy as defined in this code. Where multiple switch

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	~~Where switches control lighting loads supplied by a grounded general-purpose branch circuit, the grounded circuit conductor for the controlled lighting circuit shall be provided at the switch location.~~ ~~**Exception:** The grounded circuit conductor is not required to be provided at the switch enclosure where either of the following conditions apply:~~ ~~1. The conductors enter the box through a raceway. The raceway shall have sufficient cross-sectional 738~~ ~~area to accommodate the extension of the grounded circuit conductor of the lighting circuit to the switch location whether or not the conductors in the raceway are required to be increased in size to comply with Section E3705.3.~~ ~~2.Cable assemblies enter the box through a framing cavity that is open at the top or bottom on the same floor level, or through a wall, floor, or ceiling that is unfinished on one side.~~ 1. Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor.	locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations, the grounded conductor shall be required only at one location. A grounded conductor shall not be required to be installed at lighting switch locations under any of the following conditions: ~~for other than the following:~~ 1. Where conductors enter the box enclosing the switch through a raceway, provided that the raceway is large enough for all contained conductors, including a grounded conductor. 2. Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials. 3. Where snap switches with integral enclosures comply with E3905.1.3. 4. ~~Where the switch does not serve a habitable room or bathroom.~~ ~~5. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations.~~ 6. Where lighting in the area is controlled by automatic means. 7. Where the switch controls a receptacle load. [404.2(C)] Effective January 1, 2020, the grounded conductor shall be extended to any switch location as necessary and shall be connected to switching

AMENDED IRC-2012	IRC-2015	IRC-2018
	2. Where the box enclosing the switch is accessible for the installation of an additional or replacement cable without removing finish materials. 3. Where snap switches with integral enclosures comply with E3905.1.3. 4. Where the switch does not serve a habitable room or bathroom. 5. Where multiple switch locations control the same lighting load such that the entire floor area of the room or space is visible from the single or combined switch locations. 6. Where lighting in the area is controlled by automatic means. 7. Where the switch controls a receptacle load. [404.2(C)]	devices that require line-to-neutral voltage to operate the electronics of the switch in the standby mode. The requirement for connection to switching devices shall not apply to replacement or retrofit switches installed in locations prior to the adoption of Section E4001.15 and where the grounded conductor cannot be extended without removing finish materials. The number of electronic lighting control switches on a branch circuit shall not exceed five, and the number connected to any feeder on the load side of a system or main bonding jumper shall not exceed 25.
	E4002.6 Receptacle mounted in boxes. Receptacles mounted in boxes that are set back from the finished wall surface as permitted by Section E3906.5 shall be installed so that the mounting yoke or strap of the receptacle is held rigidly at the finished surface of the wall. Screws used for the purpose of attaching receptacles to a box shall be of the type provided with a listed receptacle, it shall be machine screws having 32 threads per inch or part of listed assemblies or systems, in accordance with	

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	manufacturer's instructions. Receptacles mounted in boxes that are flush with the wall surface or project therefrom shall be so installed that the mounting yoke or strap is seated against the box or raised cover. [406.5(C)]	
		E4002.9 Fifteen- and 20-ampere receptacles in wet locations. **Exception:** 15- and 20-ampere, 125- through 250-volt receptacles installed in a wet location and subject to routine high-pressure spray washing need not have an enclosure that is waterproof when the attachment plug is inserted.
	E4002.15 Dimmer-controlled receptacles. New section.	**E4002.15 Receptacles in countertops.** New section.
		E4002.16 Receptacle position. New section.
	E4004.2 Combustible material at outlet boxes. Combustible wall or ceiling finish exposed between the inside edge of a luminaire canopy or pan and the outlet box and having a surface area of 180 in.^{2} (116.129 mm^2) or more shall be covered with a noncombustible material. (410.23) ~~to which the luminaire connects shall be covered with a noncombustible material~~.	
		CHAPTER 41 APPLAINCE INSTALLATION
		E4101.8 Lockable disconnecting means. New section.

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	CHAPTER 42 SWIMMING POOLS	**CHAPTER 42 SWIMMING POOLS**
	E4201.2 STORABLE SWIMMING, ~~OR~~ WADING POOL OR IMMERSION POOLS; STORABLE/PORTABLE SPAS AND HOT TUBS. Revised.	
		E4202.2 Corrosive environment. New section.
		E4202.2.1 Wiring method. New section.
	E4203.1.3 GFCI protection. 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 from branch circuits with short-circuit and ground-fault protection rated at 120 volts through 240 volts ~~15 or 20 amperes, 125 volts through 240 volts,~~ single phase, whether by receptacle or direct connection, shall be provided with ground-fault circuit-interrupter protection for personnel. [680.43(A) and 680.43 (A)(1)]	
	E4203.4.2Indoor locations.	
	Insert- 2. Ceiling-supported paddle fans are identified for use beneath ceiling structures such as porches and patios.	
	E4203.4.3 Low-voltage luminaires. New section inserted.	
	E4203.6 Overhead conductor clearances. Except where installed with the clearances	

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	specified in Table E4203.5, the following parts of pools and outdoor spas and hot tubs shall not be placed under existing service-drop conductors, overhead service conductors, or any other open overhead wiring; nor shall such wiring be installed above the following: 1. Pools and the areas extending 10 feet (3048 mm) horizontally from the inside of the walls of the pool. 2. Diving structures and the areas extending not less than 10 feet (3048 mm) horizontally from the outer edge of such structures. 3. Observation stands, towers, and platforms and the areas extending not less than 10 feet (3048 mm) horizontally from the outer edge of such structures.	
		E4203.4.7 Low-voltage gas-fired luminaires, decorative fireplaces, fire pits and similar equipment. New section.
	E4204.I Performance. The equipotential bonding required by this section shall be installed to reduce voltage gradients in the prescribed areas of permanently installed swimming pools and spas and hot tubs other than the storable/portable type. ~~area as prescribed.~~	
	E4204.2Bonded parts. 2.Perimeter surfaces	

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	Exceptions: Add- 1. Equipotential bonding of perimeter surfaces shall be required for spas and hot tubs where all of the following conditions apply: 1.1 The spa or hot tub is listed as a self-contained spa for aboveground use. 1.2 The spa or hot tub is not identified as suitable only for inside use. 1.3 The installation is in accordance with the manufacturer's instructions and is located on or above grade. 1.4 The top rim of the spa or hot tub is not less than 28 in. (711 mm) above all perimeter surfaces that are within 30 in. (762 mm), measured horizontally from the spa or hot tub. The height of nonconductive external step for entry to or exit from the self-contained spa is not used to reduce or increase this rim height measurement.	

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	Revise. 2. The equipotential bonding requirements for perimeter surfaces shall not apply to a listed self-contained spa or hot tub located indoors and installed above a finished floor.	
	E4204.5.2 Connections. Connections to bonded parts shall be made in accordance with Section E3406.13.1. ~~shall be made by exothermic welding or by listed pressure connectors or clamps that are labeled as being suitable for the purpose and that are made of stainless steel, brass, copper or copper alloy. Connection devices or fittings that depend solely on solder shall not be used. Sheet metal screws shall not be used to connect bonding conductors or connection devices.~~	
		E4205.5 Motors. Wiring methods installed in the corrosive environment described in Section E4202.2.1 shall comply with Section E4202.2.2 or shall be Type MC cable listed for that location. Wiring methods installed in corrosive environments described in Section E4202.2.1 shall contain an insulated copper equipment conductor sized in accordance with Table E3908.12 but not smaller than 12 AWG. Where installed in noncorrosive environments, branch circuit wiring methods shall comply with Chapter 38. [650.21(A)(1)]

AMENDED IRC-2012	IRC-2015	IRC-2018
		~~Pool-associated motors shall be connected to an insulated copper equipment grounding conductor sized in accordance with Table E3908.12, but not smaller than 12 AWG. Where the branch circuit supplying the motor is installed in the interior of a one-family dwelling, in the interior of an accessory building associated with a one-family dwelling, using a cable wiring method permitted by Table 4202.1, an uninsulated equipment grounding conductor shall be permitted provided that it is enclosed within the outer sheath of the cable assembly. [680.21(A)(1) and (A)(4)]~~
		E4205.6 Feeders. <u>These provisions shall apply to any feeder on the supply side of panelboards supplying branch circuits for pool equipment covered in this chapter and on the load side of the service equipment. Where feeders are installed in corrosive environment as described in Section E4202,2,1, the wiring method of that portion of the feeder shall comply with Section 4202.2.2 or shall be liquid-tight flexible metallic conduit (LFNMC). Wiring methods installed in corrosive environments as described in Section E4202.2.1 shall contain an insulated copper equipment grounding conductor sized in accordance with Table E3908.12, but not smaller than 12 AWG.</u> ~~An equipment grounding conductor shall be installed with the feeder conductors between the grounding terminal of the pool equipment panelboard and the grounding terminal of the applicable service equipment. The equipment~~

AMENDED IRC-2012	IRC-2015	IRC-2018
		~~grounding conductor shall be insulated, shall be sized in accordance with Table E3608.12m=, and shall be not smaller than 12 AWG.~~
		E4205.6 Grounding and bonding terminals. New section.
		E4206.11 Electrically operated pool covers. **Exception:** 1. Motors that are part of the listed systems with ratings not to exceed the low-voltage contact limit and that are supplied by listed transformers or power supplies that comply with Section E4206.1 shall be permitted to be located less than 5 feet (1524 mm) from the inside wall of the pool. 2. Motors that are part of listed systems with ratings not exceeding the low-voltage contact limit and that are supplied by listed transformers or power supplies that comply with Section E4206.1 shall not be required to be connected to a branch circuit protected by a ground fault circuit-interrupter. ;680.27(B)(1) and (b)(2)]
	SECTION E4207 STORABLE SWIMMING POOLS, STORABLE SPAS, AND STORABLE HOT TUBS	
	E4207.5 Clearances. New section.	
	E4207.6 Disconnecting. New section.	
	E4207.7 Ground-fault circuit interrupters. New section.	

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	E4207.8 Grounding of equipment. New section.	
	E4207.9 Pool water heaters. New section.	
		E4209.1 General. New section.
		E4209.5 Bonded parts. New section.
		E4209.6 Method of bonding. New section.
	CHAPTER 43 CLASS 2 REMOTE-CONTROL, SIGNALING AND POWER-LIMITED CIRCUITS	
		E4302.1 Power sources for Class 2 circuits. Revise- 4. Listed audio/video information technology (computer) communications and industrial equipment limited power circuits.
	TABLE E4303.2 CABLE USES AND PERMITTED SUBSTITUTIONS. Revised.	
	E4302.4 Type CL2R cables. New section.	
	E4304.5 Installation of conductors and cables. Cables and conductors installed exposed on the surface of ceilings and sidewalls shall be supported by the building structure in such a manner that they will not be damaged by normal building use. Such cables shall be supported by straps, staples, hangers, cable ties or similar fittings designed so as to not damage the cable. Nonmetallic cable ties and other nonmetallic accessories used to secure and support cables located in stud cavity and joist	

AMENDED IRC-2012	IRC-2015	IRC-2018
	space plenums shall be listed as having low smoke and heat release properties. The installation shall comply with Table E3802.1 regarding cables run parallel with framing members and furring strips. The installation of wires and cables shall not prevent access to equipment nor prevent removal of panels, including suspended ceiling panels. Raceways shall not be used as a means of support for Class 2 circuit conductors, except where the supporting raceway contains conductors supplying power to the functionally associated equipment controlled by the Class 2 conductors.	
		APPENDIX E MANUFACTURED HOUSING USED AS DWELLINGS
		AE101.2 Flood hazard areas. New section**.**
	APPENDIX G PIPING STANDARDS FOR VARIOUS APPLICATIONS. New appendix**.**	
Section AH105.2 Footings. ~~In areas with a frostline depth of zero as specified in Table R301.2(1).~~ An unenclosed patio cover shall be permitted to be supported on a slab on grade without footings, provided the slab conforms to the provisions of Section R506, is not less than 3.5 inches (89 mm) thick and the columns do not support live and dead		

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loads in excess of 750 pounds (3.34 kN) per column.		
	APPENDIX J EXISTING BUILDINGS AND STRUCTURES	
	AJ102.4 Replacement windows. New subsections**.**	
	AJ102.6 Equivalent alternatives. Work performed in accordance with the International Existing Building Code shall be deemed to comply with the provisions of this appendix. These provisions are not intended to prevent the use of any alternative material, alter¬ native design or alternative method of construction not specifically prescribed herein, provided any alternative has been deemed to be equivalent and its use authorized by the building official**.**	
		APPENDIX Q TINY HOUSES. New appendix**.**
	APPENDIX R LIGHT STRAW-CLAY CONSTRUCTION. New appendix.	**APPENDIX R LIGHT STRAW-CLAY CONSTRUCTION.**
		AR101.1 Scope. This appendix shall govern the use of light straw-clay as nonbearing building material and wall infill system in Seismic Design Categories A and B. Use of light straw-clay in Seismic Design Categories C, D_0, D_1, and D_2 shall require an

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		approved engineered design by a registered design professional in accordance with Section R301.1.
		AR103.2.4 Stabilization of light straw-clay. New section.
		AR103.5.1Dimensional stability of light straw-clay prior to application to plaster finish. New section**.**
		AR104.1 Thermal characteristics. New section**.**
		AR104.2 Thermal resistance. New section**.**
	APPENDIX S LIGHT STRAWBALE CONSTRUCTION. New appendix.	**APPENDIX S LIGHT STRAWBALE CONSTRUCTION.**
		AS104.2 Purpose and where required. Strawbale walls shall be finished so as to provide mechanical protection, fire resistance and protection from weather and to restrict the passage of air through the bales, in accordance with this appendix and this code. Vertical strawbale wall surfaces shall receive a coat of plaster not less than 3/8 inch (10 mm) thick, or greater where required elsewhere in this appendix, or shall fit tightly against a solid wall panel or dense-packed cellulose insulation with a density of not less than 3.5 cubic foot (56 kg/m^3) blown into an adjacent framed wall. The tops of strawbale walls shall receive a coat of plaster not less than 3/8 inch (10 mm) thick where straw would otherwise be exposed.
		AS104.4.3.2 Clay subsoil requirements. New section**.**

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		FIGURE AS105.1(1) TYPICAL BASE OF PLASTERED STRAWBALE WALL ON CONCRETE SLAB AND FOOTING. New figure.
		FIGURE AS105.1(2) TYPICAL BASE OF PLASTERED STRAWBALE WALL OVER RAISED FLOOR. New figure.
		FIGURE AS105.1(3) TYPICAL TOP OF LOAD-BEARING STRAWBALE WALL. New figure.
		FIGURE AS105.1(4) TYPICAL TOP OF POST-AMD BEAM WALL WITH PLASTERED STRAWBALE INFILL. New figure.
		AS105.3.1 Exterior sill plates. New section.
		TABLE AS105.4 OUT-OF-PLANE RESISTANCE METHODS AND UNRESTRAINED WALL DIMENSION LIMITS. Revised.
		AS 105.6.9 Separation of exterior plaster and foundation. New section.
		AS06.2 Building limitations and requirements for use of strawbale structural walls. New section.
		AS106.12.3 Roof-bearing assembly. New section and subsections.
		AS016.15 Post-and-beam with strawbale infill. New section.
		AS108.1 R-value. The unit R-value of a strawbale wall with bales laid flat is R-1.22 ~~R-1.3~~ per inch of bale thickness. The unit R-value of a strawbale wall with bales on-edge is R-1.85 ~~R-2~~ per inch of bale thickness.
		AS108.2 Compliance with Section R302.10.1 New section.

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	APPENDIX T RECOMMENDED PROCEDURE FOR WORST-CASE TESTING OF ATMOSPHERIC VENTING SYSTEMS UNDER N1102.4 OR N1105 CONDITIONS. New appendix.	
	APPENDIX U SOLAR-READY PROVISIONS-DETACHED ONE- AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES). New appendix.	**APPENDIX U SOLAR-READY PROVISIONS-DETACHED ONE- AND TWO-FAMILY DWELLINGS, MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES).**
		T103.5 Shading. New section.
		T103.6 Capped roof penetration sleeve. New section.