

Amendment A-11

2015 International Residential Code

Part 5 – BUILDING REGULATIONS AND CODES

International Residential Code®, 2015 Edition (IRC®, 2015)

Part 5, Chapter 11 “*International Residential Code*”

The following sections, paragraphs, and sentences of the *2015 International Residential Code* are hereby amended as follows: Standard type is text from the IRC. Underlined type is text inserted. ~~Lined through type is deleted text from IRC.~~

R102.4 Referenced codes and standards. These provisions shall be known as the Residential Code for *One- and Two- family Dwellings* of the City of Choctaw, and shall be cited as such and will be referred to herein as “this code”.

R102.4 Referenced codes and standards. ~~The codes, when specifically adopted, and standards referenced in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R102.4.1 and R102.4.2. Whenever amendments have been adopted to the referenced codes and standards, each reference to said code and standard shall be considered to reference the amendments as well. Any reference made to NFPA 70 or the Electrical Code shall mean the Electrical Code as adopted.~~

R104.10.1 Flood hazard areas. ~~The building official shall not grant modifications to any provisions required in~~ reference Part 18, Chapter 2 of the City of Choctaw Code of Ordinances for flood hazard areas as established by Federal Emergency Management Agency. Table 301.2(1) unless a determination has been made that:

~~**R105.3.1.1 Determination of substantially improved or substantially damaged existing buildings in flood hazard areas.** Reference City of Choctaw Code of Ordinance Part 18, Chapter 2.~~

Section R202 – Definitions;

[RB] ACCESSORY STRUCTURE. A structure not greater than 3,000 square feet (279 m²) in floor area, and not over two stories in height, that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot.

BUILDING DRAIN. ~~The lowest piping that collects the discharge from all other drainage piping inside the house and extends 30 inches (762 mm) in developed length of pipe beyond the exterior walls and conveys the drainage to the building sewer. That part of the lowest piping of a drainage system that receives the discharge from soil, waste, and~~

other drainage pipes inside and that extends 5 feet (1524 mm) in developed length of pipe beyond the exterior walls of the building and conveys the drainage to the building sewer.

HABITABLE SPACE. A space in a building for living, sleeping, eating or cooking. Bathrooms, toilet rooms, closets, halls, storage, outdoor kitchens, or utility spaces and similar areas are not considered *habitable space*.

KITCHEN. Kitchen shall mean an area used, or designated to be used, for the preparation or cooking of food inside the dwelling. The presents or design layout of having a refrigerator, sink, and stove or range shall be considered as a kitchen. Does not apply to outdoor kitchens.

NATIONALLY RECOGNIZED TESTING LABORATORY. A testing facility given this designation from the United States Occupational Safety and Health Administration (OSHA) that provides product safety testing and certification services to manufacturers.

OUTDOOR KITCHEN. An open air area separate from the habitable space that is used for the preparation or cooking of food outside in an unconditioned space typically on a porch area, patio, terrace or in the side or back yard.

SAFE ROOM. A building or structure or portions thereof, constructed in accordance with ICC/NSSA Standard for the design and construction of Storm Shelters®, (ICC 500®), and constructed to provide near-absolute protection for its occupants from severe wind storm events such as tornados or hurricanes.

1. **Community safe room.** A safe room designed and constructed in accordance with the Federal Emergency Management Agency (FEMA) document P-361 entitled "Design and Construction Guidance for Community Safe Rooms® (FEMA P-361®), intended to provide life-safety protection for more than 16 persons.
2. **Other Safe Room.** A safe room designed and constructed in accordance with FEMAP-361® "Design and Construction Guidance for Community Safe Rooms" or FEMA P-320® entitled "Taking Shelter from the Storm: Building a Safe Room for your Home or Small Business®," located in a residence or non-residential building or structure, intended to provide life-safety protection for 16 persons or less

[RE] SLEEPING UNIT. See ~~Section N1101.6~~ Chapter 2 of the 2015 International Building Code for definition ~~applicable in Chapter 11.~~

STORM SHELTER. A building, structure, or portions thereof, constructed in accordance with ICC 500® and designated for use during a severe wind storm event such as a hurricane or tornado.

1. **Community storm shelter.** A storm shelter not defined as a "Residential storm shelter."

2. Residential storm shelter. A storm shelter serving occupants of dwelling units and having an occupant load not exceeding 16 persons.

TOWNHOUSE. A single-family dwelling unit constructed in a group of three or more attached units separated by property lines in which each unit extends from foundation to roof and with a *yard* or *public way* on at least two sides.

Table 301.2(1) –The table has been modified to read:

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

GROUND SNOW LOAD	WIND DESIGN				SEISMIC DESIGN CATEGORY	SUBJECT TO DAMAGE FROM		
	Speed (mph)	Topographic effects	Special Wind Region	Wind-borne debris zone		Weathering	Frost Line Depth	Termite
10 lb/ft²	115 Vmph	NO	NO	NO	B	Moderate	18”	Slight to Moderate
WINTER DESIGN TEMP		ICE BARRIER UNDERLAYMENT REQUIRED		FLOOD HAZARDS		AIR FREEZING INDEX		MEAN ANNUAL TEMP
13		NO		FEMA NFIP ID# 400357 – Dec. 18, 09		1500		60 °F

Section R302.1; add exception #6 to read as follows:

Exceptions: *{previous exceptions unchanged}*

6. Open non-combustible carport structures may be constructed when also approved within adopted ordinances.

Table 302.1(1) –The table has been modified to read:

Table R302.1(1) Exterior Walls has been modified to change most of the requirements in the column entitled "Minimum Fire Separation Distance" and to delete certain sub-rows under the column "Exterior Wall Element". The table description with modifications, is listed below:

TABLE R302.1(1) - EXTERIOR WALLS

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCES
Walls	Fire-resistance rated	1 hour - tested in accordance with ASTM E119 or UL 263 with exposure from both sides	< 3 feet
Walls	Not fire-resistance rated	0 hours	≥ 3 feet
Projections	Fire-resistance rated	1 hour on the underside ^{a,b}	< 3 feet
Projections	Not fire-resistance rated	0 hours	≥ 3 feet
Openings in Walls	Not allowed	N/A	< 3 feet
Openings in Walls	Unlimited	0 hours	≥ 3 feet
Penetrations	All	Comply with Section R302.4	< 3 feet

Penetrations	All	None required	≥ 3 feet
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For SI: 1 foot = 304.8 mm N/A

= Not Applicable.

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

Table 302.1(2) –The table has been modified to read:

Table R302.1(2) Exterior Walls – Dwellings with Fire Sprinklers. This table has been modified to strike certain sub-rows underneath the column "Exterior Wall Element." The table description with modifications is listed below:

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

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCES
Walls	Fire-resistance rated	1 hour - tested in accordance with ASTM E119 or UL 263 with exposure from both sides	0 feet
Walls	Not fire-resistance rated	0 hours	3 feet ^a
Projections	Fire-resistance rated	1 hour on the underside ^{b,c}	2 feet ^a
Projections	Not fire-resistance rated	0 hours	3 feet
Openings in Walls	Not allowed	N/A	< 3 feet
Openings in Walls	Unlimited	0 hours	3 feet ^a
Penetrations	All	Comply with Section R302.4	< 3 feet
Penetrations	All	None required	3 feet ^a

For SI: 1 foot = 304.8 mm N/A

= Not Applicable.

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

R303.1 Habitable rooms. This section has been modified to read:

Section R303.1 Habitable rooms. Habitable rooms shall have an aggregate glazing area of not less than 8 percent of the floor area of such rooms. Natural *ventilation* shall be through windows, skylights, doors, louvers or other *approved* openings to the outdoor air.

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

Exceptions:

1. The glazed areas need not be openable where the opening is not required by Section R310 and ~~a whole-house~~ an approved mechanical ventilation system is installed in accordance with Section M1507 capable of producing 0.35 air change per hour in the room is installed or a whole-house mechanical ventilation system is installed capable of supplying outdoor ventilation air of 15 cubic feet per minute (cfm) per occupant on the basis of two occupants for the first bedroom and one occupant for each additional bedroom.
2. The glazed areas need not be installed in rooms where Exception 1 is satisfied and artificial light is provided that is capable of producing an average illumination of 6 footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.
3. Use of sunroom and patio covers, as defined in Section R202, shall be permitted for natural *ventilation* if in excess of 40 percent of the exterior sunroom walls are open, or are enclosed only by insect screening.

Section R311.1 Means of egress. Dwellings and garages (attached or detached from the dwelling) shall be provided with a means of egress in accordance with this section. The means of egress shall provide a continuous and unobstructed path of vertical and horizontal egress travel from all portions of the *dwelling* to the required egress door without ~~requiring travel~~ traveling through a garage. The means of egress from the garage may travel through the adjacent dwelling. The required egress door shall open directly into a public way or to a *yard* or court that opens to a public way.

Section R311.2 Egress door. Not less than one egress door shall be provided for each dwelling unit and garage. The egress door shall be side-hinged, and shall provide a clear width of not less than 32 inches (813 mm) where measured between the face of the door and the stop, with the door open 90 degrees (1.57 rad). The clear height of the door opening shall not be less than 78 inches (1981 mm) in height measured from the top of the threshold to the bottom of the stop. Other doors shall not be required to comply with these minimum dimensions. Egress doors shall be readily openable from the inside of the dwelling or garage without the use of a key or special knowledge or effort.

Section R311.7.5.1 Risers. The riser height shall be not more than 7 3/4 inches (196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted provided that the openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below do not permit the passage of a 4-inch-diameter (102 mm) sphere.

Exceptions:

1. The openings between adjacent treads is not limited on spiral stairways.
2. The riser height of spiral stairways shall be in accordance with Section R311.7.10.1.
3. The top and bottom riser in each flight of stairs may vary by 3/4 inch (19 mm).

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

~~Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential sprinkler system. If one chooses to install an automatic residential fire sprinkler please refer to the State of Oklahoma adoption 748 Uniform Building Code Commission and the section is entitled, "Appendix V" and is renumbered to become V101.1.~~

Section R313.2.1 Design and installation. ~~Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D. If one chooses to install an automatic residential fire sprinkler please refer to the State of Oklahoma adoption 748 Uniform Building Code Commission and the section is entitled, "Appendix V" and is renumbered to become V101.2.~~

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

Exceptions:

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

Section R315.2.2 Alterations, repairs and additions. Where alterations, repairs, or additions requiring a permit occur, or where one or more sleeping rooms are added or created in existing dwellings, the individual dwelling unit shall be equipped with carbon monoxide alarms located as required for new dwellings.

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, 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 electrical, plumbing or mechanical systems are exempt from the requirements of this section.

Section R323.1 General. This section applies to ~~storm shelters where constructed as separate detached buildings or where constructed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornados and hurricanes the construction of above or below ground storm shelters and safe rooms constructed as separate detached buildings rooms within buildings, structures, or portions thereof for the purpose of~~

providing safe refuge from storms that produce high winds, such as tornados. Any room or structure, as may be used as a place of refuge during a severe wind storm event, shall not be defined as a storm shelter or safe room unless specifically designed to the requirements listed in Section R323. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with the following: ICC/NSSA 500.

R323.2 Definitions. R323.2 Definitions. The following definitions are defined in Chapter 2 of this code:

1. **SAFE ROOM**
 - 1.1. Community safe room.
 - 1.2. Other safe room.
2. **STORM SHELTER**
 - 2.1. Community storm shelter.
 - 2.2. Residential storm shelter.

Section R326.1 General. ~~The design and construction of pools and spas shall comply with the *International Swimming Pool and Spa Code*.~~ Residential swimming pools, spas, and hot tubs requiring a permit shall comply with Sections R326.2 through R326.4.

Section R326.2 Enclosure. Swimming pools shall be completely enclosed by a fence or barrier not less than 4 feet (1219 mm) in height or a screen enclosure. Openings in the fence or barrier shall not permit the passage of a 4-inch-diameter (102 mm) sphere.

Exceptions:

1. A swimming pool with a power safety cover or a spa with a safety cover complying with ASTM F 1346 need not comply with this section.

Section R326.3 Gates. Exterior pedestrian access doors or gates shall be self-closing and have a self-latching device. Doors or gates other than pedestrian access doors or gates shall have a self-latching device. Where the release mechanism of the self-latching device is located less than 54 inches (1372 mm) from the bottom of the door or gate, the release mechanism shall be located on the pool side of the door or gate, 3 inches (76 mm) or more below the top of the door or gate, and the door or gate and barrier shall be without openings greater than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

Exception: Gates equipped with a locking device.

R326.4 Entrapment avoidance. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

Section R401.2. Requirements. *{existing text unchanged}* ... Every foundation and/or footing, or any size addition to an existing post-tension foundation, regulated by this code shall be designed and sealed by an Oklahoma registered engineer.

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

Exception:

Interior concrete slabs on grade and enclosed garage slabs are not required to be air-entrained.

Figure R403.1 (1) PLAIN CONCRETE FOOTINGS WITH MASONRY AND CONCRETE STEM WALLS IN SDC A, B AND C. The "Notes" at the bottom of the figure have been amended to read:

(1) Figure R403.1(1)

- a. See Section 404.3 for sill requirements.
- b. See Section 403.1.6 for sill attachment.
- c. See Section R506.2.3 for vapor barrier requirements.
- d. See Section R403.1 for base.
- e. See Figure R403.1.3 for additional footing requirements for structures in SDC D0, D1, and D2 and townhouses in SDC C.
- f. See Section R408 for under-floor ventilation and access requirements.
- g. Add two number four (4) rebar to all footings. Additionally all cold joints between footings and foundation walls (stem walls) shall be tied together by a number four (4) rebar at every corner and not to exceed 6 feet (1828 mm) o.c. with embedment of 12 inches (304 mm) into each footing and wall.

Section R403.1.6 Foundation anchorage. Wood sill plates and wood walls supported directly on continuous foundations shall be anchored to the foundation in accordance with this section.

Cold formed steel framing shall be anchored directly to the foundation or fastened to wood sill plates anchored to the foundation. Anchorage of cold-formed steel framing shall be in accordance with this section and Section R505.3.1 or R603.3.1.

Wood sole plates at the exterior walls on monolithic slabs, wood sole plates of braced wall panels at building interiors on monolithic slabs and all wood sill plates shall be anchored to the foundation with minimum 1/2-inch-diameter (12.7 mm) anchor bolts spaced a maximum of 6 feet (1829 mm) on center or approved anchors or anchor straps spaced as required to

provide equivalent anchorage to 1/2-inch-diameter (12.7 mm) anchor bolts. Bolts shall extend a minimum of 7 inches (178 mm) into concrete or grouted cells of concrete masonry units. The bolts shall be located in the middle third of the width of the plate. A nut and washer shall be tightened on each anchor bolt. There shall be a minimum of two bolts per plate section with one bolt located not more than 12 inches (305 mm) or less than seven bolt diameters from each end of the plate section. Interior bearing wall sole plates ~~on monolithic slab foundation~~ that are not part of a braced wall panel shall be positively anchored with approved fasteners. Hand driven cut or concrete nails are not approved fasteners. Sill plates and sole plates shall be protected against decay and termites where required by Section R317 and R318.

Exceptions:

1. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section and shall be attached to adjacent braced wall panels at corners as shown in Item 9 of Table R602.3(1).
2. Connection of walls 12 inches (305 mm) total length or shorter connecting offset braced wall panels to the foundation without anchor bolts shall be permitted. The wall shall be attached at corners as shown in Item 9 of Table R602.3(1).
3. Wood sole plates of braced wall panels at building interiors on monolithic slabs may be anchored using connector(s) with a shear capacity of 2300 pounds and a tensile capacity of 800 pounds over a maximum span of 6 feet.

Section R403.1.9. Protection of footings: Trenching for work including but not limited to plumbing, electrical, storm shelters, and pools shall comply with this section. Trenching installed parallel to footings and walls shall not extend into the bearing plane of a footing wall. The upper boundary of the bearing plane is a line that extends downward, at an angle of 45 degrees from horizontal, from the outside bottom edge of the footing wall.

Section R406.2 Concrete and masonry foundation waterproofing. In areas where a high water table or other severe soil-water conditions are known to exist, exterior foundation walls that retain earth and enclose interior spaces and floors below grade shall be water proofed from the higher of (a) the top of the footing or (b) 6 inches (152 mm) below the top of the basement floor, to the finished grade. Walls shall be waterproofed in accordance with one of the following:

1. Two-ply hot-mopped felts.
2. Fifty-five-pound (25 kg) roll roofing.
3. Six-mil (0.15 mm) polyvinyl chloride.
4. Six-mil (0.15 mm) polyethylene.
5. Forty-mil (1 mm) polymer-modified asphalt.
6. Sixty-mil (1.5 mm) flexible polymer cement.
7. One-eighth-inch (3 mm) cement-based, fiber-reinforced waterproof coating.
8. Sixty-mil (1.5 mm) solvent-free liquid-applied synthetic rubber.
9. Bentonite.

Exception: Organic-solvent-based products such as hydrocarbons, chlorinated hydrocarbons, ketones and esters shall not be used for ICF walls with expanded polystyrene form material. Use of plastic roofing cements, acrylic coatings, latex coatings, mortars, and parings to seal ICF walls is permitted. Cold-setting asphalt or hot asphalt shall conform to Type C of ASTM D 449. Hot asphalt shall be applied at a temperature of less than 200 degrees Fahrenheit (93 degrees Celsius).

All joints in membrane waterproofing shall be lapped and sealed with an adhesive compatible with the membrane.

Section R506.2.1 Fill. Fill material shall be free of vegetation and foreign material. The fill shall be compacted in 8 to 12 inch (203 mm to 305 mm) lifts to ensure uniform support of the slab, and except where approved, the fill depths shall not exceed ~~24 inches (610 mm)~~ 48 inches (1220 mm) for clean sand or gravel and 8 inches (203 mm) for earth.

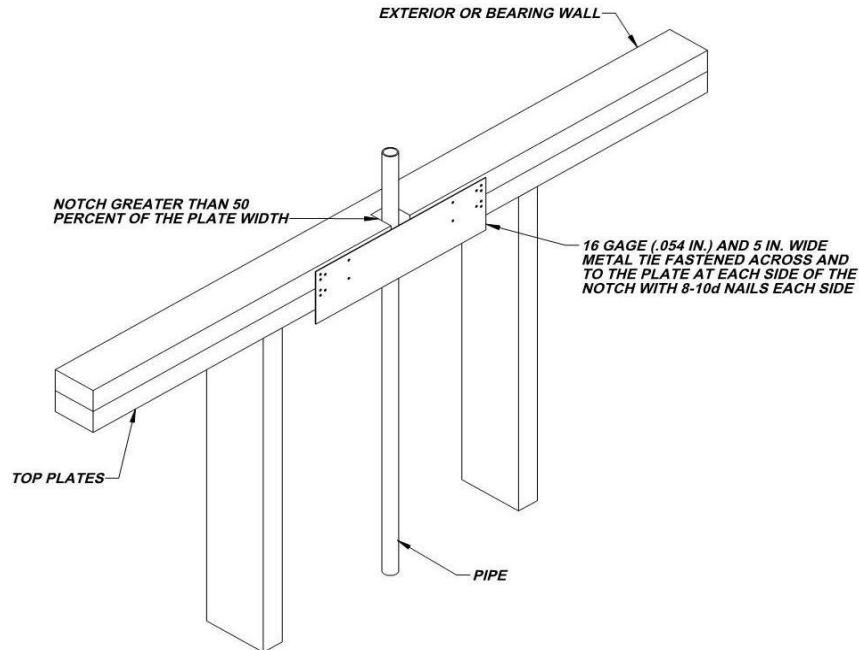
Section R506.2.3 Vapor retarder. A 6 mil (0.006 inch; 152 micrometers) polyethylene sheeting, other industry accepted vapor retarder products installed per manufacturer specifications or approved vapor retarder with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where no base course exists.

Exception: The vapor retarder is not required for the following:

1. Garages, utility buildings and other unheated accessory structures.
2. For unheated storage rooms having an area less than 70 square feet (6.5 square meters) and carports.
3. Driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.
4. Where approved by the building official, based on local site conditions.

R602.6.1 Drilling and notching of top plate. When piping or ductwork is placed in or partly in an exterior wall or interior load-bearing wall, necessitating cutting, drilling or notching of the top plate by more than 50 percent of its width, a galvanized metal tie not less than 0.054 inch thick (1.37 mm) (16 Ga) and ~~1½ inches (38) mm~~ 5 inches (127 mm) wide shall be fastened across and to the plate at each side of the opening with not less than eight 10d (0.148 inch diameter) having a minimum length of 1 ½ inches (38 mm) at each side or equivalent. Fasteners will be offset to prevent splitting of the top plate material. The metal tie must extend a minimum of 6 inches past the opening. See figure R602.6.1. {remainder unchanged}

Figure R602.6.1; delete the figure and insert the following figure:



Section R602.10.5 Minimum length of a braced wall panel. The minimum length of a braced wall panel shall comply with Table R602.10.5. For methods CS-WSP and CS-SFB, the minimum panel length shall be based on the adjacent clear opening height in accordance with Table R602.10.5 and Figure R602.10.5. Where a panel has an opening on either side of differing heights, the taller opening height shall be used to determine the panel length. For method CS-PF, it is permissible to begin the portal frame at 12 1/2 feet (3810 mm) from the wall line end.

Section R602.10.8 Braced wall panel connections. Braced wall panels shall be connected to the floor framing or foundations as follows:

1. Where joists are perpendicular to a braced wall panel above or below, a rim joist, band joist or blocking shall be provided along the entire length of the braced wall panel in accordance with Figure R602.10.8(1). Fastening of top and bottom wall plates to framing, rim joist, band joist and/or blocking shall be in accordance with Table R602.3(1).
2. Where joists are parallel to a braced wall panel above or below, a rim joist, end joist or other parallel framing member shall be provided directly above and below the braced wall panel in accordance with Figure R602.10.8(2). Where a parallel framing member cannot be located directly above and below the panel, full-depth blocking at 16-inches (406 mm) spacing shall be provided between parallel framing members to each side of the braced wall panel in accordance with figure R602.10.8(2). Fastening of blocking and wall plates shall be in accordance with Table R602.3 (1) and Figure R602.10.8 (2).
3. Connections of braced wall panels to concrete or masonry shall be in accordance with Section R403.1.6.

4. Wood sole plates of braced wall panels at building interiors on monolithic slabs maybe anchored using connector(s) with a shear capacity of 2300 pounds and a tensile capacity of 800 pounds over a maximum span of 6 feet (1829 mm).

Section R602.12 Simplified wall bracing Buildings meeting all of the conditions listed below shall be permitted to be braced in accordance with this section as an alternate to the requirements of Section R602.10. The entire building shall be braced in accordance with this section; the use of other bracing provisions of Section R602.10, except as specified herein, shall not be permitted.

1. There shall be not more than three stories above the top of a concrete or masonry foundation or basement wall. Permanent wood foundations shall not be permitted.
2. Floors shall not cantilever more than 24 inches (~~607 mm~~) (610 mm) beyond the foundation or bearing wall below.
3. Wall height shall not be greater than ~~10 feet (3048 mm)~~ 12 feet (3658 mm).
4. The building shall have a roof eave-to-ridge height of ~~15 feet (4572mm)~~ 20 feet (6096 mm) or less.
5. Exterior walls shall have gypsum board with a minimum thickness of 1/2 inch (12.7mm) installed on the interior side fastened in accordance with Table R702.3.5.
6. The structure shall be located where the ultimate design wind speed is less than or equal to ~~130 mph (58m/s)~~ 115 mph (51.4 m/s), and the exposure category is B or C.
7. The structure shall be located in Seismic Design Category A, B, or C for detached one- and two-family dwellings or Seismic Design Category A or B for townhouses.

Section R602.12.2 Sheathing materials. The following sheathing materials installed on the exterior side of exterior walls shall be used to construct a bracing unit as defined in Section R602.12.3. Mixing materials is prohibited.

1. Wood structural panels with a minimum thickness of ~~3/8 inch (9.5mm)~~ 7/16 inch (11.11 mm) fastened in accordance with Table R602.3(3).
2. Structural fiberboard sheathing with a minimum thickness of 1/2 inch (12.7 mm) fastened in accordance with Table R602.3(1).

Figure R703.8 Typical Masonry Veneer Wall Details. This figure has been modified to add footnotes "f" and "g" to the footnote section and amend the figure heading to include a superscript "f" and "g" to indicate the associated footnotes. This figure's footnotes have been modified to read:

- a. See Sections R703.8.5, R703.8.6, and R703.4.
- b. See Section R703.2 and R703.8.4.
- c. See Section R703.8.4.2 and Table R703.8.4.
- d. See Section R703.8.3.
- e. Figure R703.8 illustrates typical construction details for a masonry veneer wall. For the actual mandatory requirements of this code, see the indicated sections of text. Other details of masonry veneer wall construction shall be permitted provided the requirements of the indicated sections of text are met.

- f. Flashing to be done per Section R703.4, in accordance with a design from a registered design professional or in accordance with other approved methods or standard industry practices.
- g. Flashing depicted under sill and above windows are not required with windows that have nailing flanges for their primary attachment. Flange type windows should be counter flashed into the weather resistant barrier or installed per Section R703.4.

Figure R703.8.2.1 Exterior Masonry Veneer Support by Steel Angles.

- a. Flashing to be done per Section R703.4, in accordance with a design from a registered design professional or in accordance with other approved methods or standard industry practices.

Figure R703.8.2.2 Exterior Masonry Veneer Support by Roof Members.

- a. Flashing to be done per Section R703.4, in accordance with a design from a registered design professional or in accordance with other approved methods or standard industry practices.

Section R703.8.3.1 Allowable span. The allowable span shall not exceed the values set forth in Table R703.8.3.1. Additionally a 3 inches x 3 inches x 3/16 inch (76 mm x 76 mm x 4.8 mm) steel angle 6 feet (1829 mm) long may be used to support 3 vertical feet (914 mm) of masonry veneer and a 3 inches x 3 inches x 3/16 inch (76 mm x 76 mm x 4.8 mm) steel angle 5 feet (1524 mm) long may be used to support 4 1/4 vertical feet (1295 mm) of masonry veneer.

Section R703.8.4.1 Size and spacing. Veneer ties, if strand wire shall be not less in thickness than No. 9 U.S. gage [(0.148 inch) (4mm)] wire and shall have a hook embedded in the mortar joint, or if sheet metal, shall be not less than No. 22 U.S. gage by [(0.0299 inch) (0.76 mm)] 7/8 inch (22 mm) corrugated. Each tie shall support not more than 2.67 square feet (0.25 m²) of wall area and shall be spaced not more than 32 inches (813 mm) on center horizontally and 24 inches (635 mm) on center vertically.

In stud framed exterior walls, all ties shall be anchored to studs as follows:

1. When studs are 16 in (407 mm) o.c., stud ties shall be spaced no further apart than 24 in (737 mm) vertically starting approximately 12 in (381 mm) from the foundation; or
2. When studs are 24 in (610 mm) o.c., stud ties shall be spaced no further apart than 16 in (483 mm) vertically starting approximately 8 in (254 mm) from the foundation.

Exception verbiage is unchanged

Section R802.3 Framing details. ~~Rafters shall be framed not more than 1 1/2 inches (38 mm) offset from each other to ridge board or directly opposite from each other with the gusset plate as a tie. Ridge board shall be not less than 1 inch (25mm) nominal thickness and not less in depth than the cut end of the rafter. At valley and hips there shall be a valley or hip rafter not less than 2-inch (51 mm) nominal thickness and not less in depth than the cut end of the rafter. Hip and~~

~~valley rafters shall be supported at the ridge by a brace to a bearing partition or be designed to carry and distribute the specific load at that point. Where the roof pitch is less than three units vertical in 12 units horizontal (25 percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams. Rafters shall be framed to ridge board or to each other with a gusset plate as a tie. Ridge board shall be either at least 1-inch (25 mm) nominal thickness and not less in depth than the cut end of the rafter or at least 2-inches (51 mm) nominal thickness and one size greater than the rafters attached to it.~~

Where a 1-inch (25 mm) nominal thickness ridge is used, all rafters shall be framed not more than 1.5 inches (38 mm) offset from each other at the ridge board or if no ridge is used they should be framed directly opposite from each other with a gusset plate as a tie. When a nominal 2-inch rafter is used they may be offset with no limitations. At all valleys and hips there shall be a valley or hip rafter not less than 2-inch (51 mm) nominal thickness and not less in depth than the cut end of the rafter. Hip and valley rafters shall be supported at the ridge by a brace to a bearing partition or beam or be designed to carry and distribute the specific load at that point.

Definition of brace includes:

1. A triangular configuration of framing members with a horizontal tie and rafter members;
2. King post or similar. Where the roof pitch is less than three units vertical in 12 units horizontal (25-percent slope), structural members that support rafters and ceiling joists, such as ridge beams, hips and valleys, shall be designed as beams.

Section R802.3 Framing details. (Exception) This exception shall be added to read:

Exception: The use of a "Blind Valley", also known as a "Farmers Valley" or "California Valley" will be allowed. In this type of valley the main roof is framed as usual, it may or may not be sheathed, and the intersecting roof is framed on top of the main roof. The two valley plates or sleeps lie on top of the main roof rafters or sheathing and provide a nailing base for the jack rafters and ridge board of the intersecting roof.

Section R802.3.1 Ceiling joist and rafter connections. Ceiling joists and rafters shall be nailed to each other every 4 feet (1219 mm) on center in accordance with Table R802.5.1(9), and the rafter shall be nailed to the top wall plate in accordance with Table R602.3(1). Ceiling joists shall be continuously or securely joined in accordance with Table R802.5.1(9) where they meet over interior partitions and are nailed to adjacent rafters to provide a continuous tie across the building where such joists are parallel to the rafters.

Where ceiling joists are not connected to the rafters at the top wall plate, joists connected higher in the attic shall be installed as rafter ties, or rafter ties shall be installed to provide a continuous tie. Where ceiling joists are not parallel to rafters, the rafter ties shall be installed every 4 feet (1219 mm) on center. Rafter ties shall be not less than 2 inches by 4 inches (51 mm by 102 mm) (nominal), installed in accordance with the connection requirements in Table R802.5.1(9), or connections of equivalent capacities shall be provided. Where ceiling joists or rafter ties are not provided, the ridge formed by these rafters shall be supported by a wall,

beam, or girder designed in accordance with accepted engineering practice constructed in accordance with this code.

Collar ties or ridge straps to resist wind uplift shall be connected in the upper third of the attic space in accordance with Table R602.3 (1).

Collar ties shall be not less than 1 inch by 4 inches (25 mm by 102 mm) (nominal), spaced not more than 4 feet (1219 mm) on center.

Section R802.5 Allowable rafter spans. Spans for rafters shall be in accordance with Tables R802.5.1 (1) through R802.5.1 (8). For other grades and species and for other loading conditions, refer to the AWC STJR. The span of each rafter shall be measured along the horizontal projection of the rafter. The tabulated rafter spans in Tables R802.5.1(1) through R802.5.1(8) assume ceiling joists are located at the bottom of the attic space or some other method of resisting the outward push of the rafters on the bearing walls, such as rafter ties is provided at that location. Where ceiling joists or rafter ties are located higher in the attic space, the rafter spans in these tables shall be multiplied by the following rafter reduction factors: Where ceiling joists or rafter ties are located at one third the span of the rafter the adjustment factor is 0.67, at one quarter of the span of the rafter the adjustment factor is 0.76, at one fifth of the span of the rafter the adjustment factor is 0.83 , at one sixth of the span of the rafter, the adjustment factor is 0.90 and at two fifteenths of the rafter or less, there is no need for adjusting the rafter capacity. Exception: Collar Ties. Installation of collar ties to reduce the span of the rafters is permitted as shown in Figure R802.5.1. Collar ties shall be sized not less than the required size of the rafters they are connected to.

Section R802.5.1 Purlins. Installation of purlins to reduce the span of rafters is permitted as shown in Figure R802.5.1. Purlins shall be sized not less than the required size of the rafters that they support. Purlins shall be continuous and shall be supported by 2-inch by 4-inch (51 mm by 102 mm) braces installed to bearing walls at a slope not less than 45 degrees (0.79 rad) from the horizontal. The braces shall be spaced not more than 4 feet (1219 mm) on center and the unbraced length of the braces shall not exceed 8 feet (2438 mm).

Exception: Braces may be spaced not more than 6 feet (1829 mm) on center if:

1. The purlin brace is 2-inch by 6-inch (51 mm by 153 mm),
2. Purlins shall be sized one nominal size larger than the rafter they support, and
3. unbraced length of braces shall not exceed 8 feet (2438 mm).

R902.1 Roofing covering materials. Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B, or C roofing shall be installed ~~in areas designated by law as requiring their use or when the edge of the roof is less than 3 feet from a lot line.~~ *{remainder unchanged}*

Exceptions:

1. *{text unchanged}*

2. *{text unchanged}*
3. *{text unchanged}*
4. *{text unchanged}*
5. Non-classified roof coverings shall be permitted on one-story detached *accessory structures* used as tool and storage sheds, playhouses and similar uses, provided the floor area does not exceed 200 square feet.

Section R905.2.1 Sheathing requirements. Asphalt shingles shall be fastened to solidly sheathed decks in accordance with Section R803 or to the asphalt shingles manufacturer's installation instructions.

Section R908.3.1.1 Roof re-cover. A roof re-cover shall not be permitted where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.
4. Where the existing roof has one or more application of asphalt shingles additional applications of asphalt shingles shall not be permitted.

Section R1005.7 Factory-built chimney offsets. Where a factory-built chimney assembly incorporates offsets, no part of the chimney shall be at an angle of more than 30 degrees (0.52 rad) from vertical at any point in the assembly and the chimney assembly shall not include more than four elbows.

Exception:

Where chimneys are part of a listed and labeled factory-built fireplace they may be installed in accordance with the fireplace and chimney manufacturer's installation instructions.

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code.

Exception:

Portions of the building envelope that do not enclose conditioned space.

Section N1101.4 (R102.1.1) Above code programs. The building official or other authority having jurisdiction shall be permitted to deem a national, state, or local energy-efficiency program to exceed the energy efficiency required by this chapter. Buildings approved in writing by such an energy-efficiency program shall be considered in compliance with this ~~code~~ chapter. ~~The requirements identified as "mandatory" in this chapter, as applicable, shall be met.~~

Section N1101.10.1 (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~~ more wide. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and R-value of the 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 product's package and shall be listed on the certification.~~ For sprayed polyurethane foam (SPF) insulation, the installed thickness of the area covered and R-value of installed thickness shall be listed on the certificate. The insulation installer shall sign, date and post the certificate in a conspicuous location on the job site.

Section N1101.10.3 (R303.1.3) Fenestration product rating. U-factors of fenestration products (windows, doors, and skylights) shall be determined in accordance with NFRC 100 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 N1101.10.3 (1) or N1101.10.3 (2). The solar heat gain coefficient (SHGC) 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 shall be assigned a default SHGC from ~~Table 1103.10.3(3).~~ Table 1101.10.3(3).

Section N1101.10.4 (R303.1.4) Insulation product rating: The thermal resistance (R-value) of insulation shall be determined in accordance with the ~~U.S. Federal Trade Commission R-value rule~~ CFR Title 16, Part 460 in units of h x square foot x Fahrenheit/BTU at a mean temperature of 75 degrees Fahrenheit (24 degrees Celsius).

Section N1101.11 (R303.2). Installation: All materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the provisions of this code.

Section N1101.13 (R401.2) Compliance. ~~Projects shall comply with one of the following:~~

- ~~1) Sections N1101.14 through N1104,~~
- ~~2) Section N1105 and the provisions of Sections N1101.14 through N1104 labeled "Mandatory,"~~
- ~~3) An energy rating index (ERI) approach in Section N1106.~~

Compliance shall be demonstrated by either meeting the requirements of the 2009 International Energy Conservation Code® or meeting the requirements of this chapter. Climate zones from figure N1101.7 or Table 1101.7 shall be used in determining the applicable requirements from this chapter.

Section N1101.14 (R401.3) Certificate (Mandatory). This section has been renumbered in Appendix W to become W101.1.

Section N1102.1 (R402.1) General (Prescriptive). This section, including the exception has been stricken from the code.

Section N1102.1.1 (R402.1.1) Vapor retarder. This section has been stricken from the code.

Section N1102.1.3 (R402.1.3) R-value computation. Insulation material used in layers, such as framing cavity insulation, ~~or continuous insulation~~ and insulation 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-value for insulated siding shall be reduced by R-0.6.~~

Table N1102.1.2 Insulation and fenestration requirements by component. At the end of the table heading is a superscript "a" and a superscript "m" to indicate associated footnotes.

The table description with modifications, is listed below:

1. The table has eight rows with eleven columns. The first row is a header with the following header columns: Climate zone, Fenestration U-factor (with a superscript "b" to indicate a footnote), Skylight U-factor (with a superscript "b" to indicate a footnote), Glazed Fenestration SHGC (with the subscript "b" and "e" footnote indications stricken), Ceiling R-value, Wood Frame Wall R-value, Mass Wall R-value (with a superscript "i" to indicate a footnote), Floor R-value, Basement Wall R-value (with a superscript "c" to indicate a footnote), Slab R-value and depth (with a superscript "d" to indicate a footnote), and Crawl space wall R-value (with a superscript "c" to indicate a footnote).
2. The second and third rows, entitled "1" and "2" under the first column header "Climate zone" and continuing across all column headings have been stricken from the table.
3. The fourth row, entitled "3" under the first column header "Climate zone" has been modified in specific column headers listed below:
 - (i.) Under column header "Fenestration U-factor," the requirement has been changed from "0.35" to "0.40" with a "superscript "i" to indicate an associated footnote.
 - (ii.) Under column header "Glazed Fenestration SHGC," the requirement has been changed from "0.25" to "0.35" with superscript letters "e" and "j" added to indicate associated footnotes.
 - (iii.) Under column header "Ceiling R-value," the requirement has been changed from "38" to "30."
 - (iv.) Under column header "Wood frame wall R-value," the requirement has been changed from "20 or 13 + 5h" to "13."
 - (v.) Under the column header "Slab R-Value and Depth" a superscript "l" has been added to indicate an associated footnote.

4. The fifth row, entitled "4 except Marine" under the first column header "Climate zone" has been modified in specific columns headers listed below:
 - (i.) Under column header "Skylight U-factor," the requirement has been changed from "0.55" to "0.60."
 - (ii.) Under column header "Glazed Fenestration SHGC," the requirement has been changed from "0.40" to "NR."
 - (iii.) Under column header "Ceiling R-value," the requirement has been changed from "49" to "38."
 - (iv.) Under column header "Wood frame Wall R-value," the requirement has been changed from "20 or 13 +5h" to "13."
 - (v.) Under column header "Mass wall R-value" the requirement has been changed from "8/13" to "5/10."
5. The sixth, seventh, and eighth rows, entitled "5 and Marine 4", "6," and "7 and 8" respectively, under the first column heading "Climate zone" and continuing across all column headings have been stricken from the table.
6. Footnote "a." has been modified to read: R-values are minimums. U-factors and SHGC are maximums, R-19 batts compressed into nominal 2 x 6 framing cavity such that the R-Value is reduced by R-1 or more shall be marked with the compressed R-Value in addition to the full thickness R-value.
7. Footnote "b." has been modified to read: The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
8. Footnote "c." has been modified to read: The first R-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
9. Footnote "d." R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less, in zones 1 through 3 for heated slabs.
10. Footnote "e." There are no SHGC requirements in the Marine Zone.
11. Footnote "f." Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
12. Footnote "g." Or insulation sufficient to fill the framing cavity, R-19 minimum.
13. Footnote "h." has been modified to read: "13 + 5" means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of the exterior, structural sheathing shall be supplemented with insulated sheathing of at least R-2.

14. Footnote "i." has been modified to read: For impact-rated fenestration complying with Section R301.2.1.2, the maximum U-factor shall be 0.75 in zone 2 and 0.65 in zone 3.
15. A new footnote "j." has been added to read: For impact-resistant fenestration complying with Section R301.2.1.2 of the 2015 International Residential Code®, the maximum SHGC shall be 0.40.
16. The previously labeled footnote "i." has been renamed to "k." and has been modified to read as follows: The second R-value applies when more than half the insulation is on the interior.
17. A new footnote "l" has been added to read: If foundation/slab insulation is used and slab ledge exists 1/2 inch insulation in Vertical position is allowed as thermal break between slab edge and foundation wall so that slab can still bear on horizontal ledge. (R) A new footnote "m" has been added to read: In addition to the requirements in Table N1102.1.2, one of the following improvements are required:
 - (i.) Fenestration U Factors to be 0.35.
 - (ii.) Wood Frame Wall R-Value to be R15.
 - (iii.) Slab R-Value and Depth to be 5.2 feet.
 - (iv.) Ceiling R-Value to be R38.
 - (v.) Exception: If duct testing is performed and passed in accordance with N1103.3.2 by either the post-construction test or rough-in test no further upgrade is required from the values in Table N1102.1.2.

SAMPLE: TABLE N1102.1.2 INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT

CLIMATE ZONE	FENSTRATION UFACTOR ^b	SKYLIGHT U-FACTOR ^b	GLAZED FENSTRATION SHGC	CEILING RVALUE	WOOD FRAME WALL RVALUE	MASS WALL RVALUE ⁱ	FLOOR RVALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE & DEPTH	CRAWL SPACE ^e WALL RVALUE
3	0.40 ^l	0.55	0.35 ^{e,j}	30	13	8/13	19	5/13 ^f	0 ^l	5/13
4 except Marine	0.35	0.60	NR	38	13	5/10	19	10/13	10, 2 ft	10/13

- a. R-values are minimums. U-factors and SHGC are maximums, R-19 batts compressed into nominal 2 x 6 framing cavity such that the R-Value is reduced by R-1 or more shall be marked with compressed R-Value in addition to the full thickness R-value. b. The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- c. The first R-value applies to continuous insulation, the second to framing cavity insulation; either insulation meets the requirement.
- d. R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less, in zones 1 through 3 for heated slabs.
- e. There are no SHGC requirements in the Marine Zone.
- f. Basement wall insulation is not required in warm-humid locations defined by Figure N1101.7 and Table N1101.7.
- g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
- h. 13 +5 means R-13 cavity insulation plus R-5 insulated sheathing. If structural sheathing covers 25 percent or less of the exterior, R-5 sheathing is not required where structural sheathing is used. If structural sheathing covers more than 25 percent of the exterior, structurally sheathing shall be supplemented with insulated sheathing of at least R-2.
- i. For impact-rated fenestration complying with Section R301.2.1.2., the maximum U-factor shall be 0.75 in zone 2 and 0.65 in zone 3.
- j. For impact-resistant fenestration complying with Section R301.2.1.2. of the 2015 International Residential Code, the maximum SHGC shall be 0.40.
- k. The second R-value applies when more than half the insulation is on the interior.

- l. If foundation/slab insulation is used and slab ledge exists 1/2 inch insulation in Vertical position is allowed as thermal break between slab edge and foundation wall so that slab can still bear on the horizontal ledge.
- m. In addition to the requirements in Table N1102.1.2, one of the following improvements are required: Fenestration U-factors to be 0.35; Wood Frame Wall R-value to be R15; Slab R-value and Depth to be 5.2 feet; Ceiling R-value to be R38. Exception: If duct testing is performed and passed in accordance with N1103.3.2 by either the post-construction test or rough-in test no further upgrade is required from the values in Table N1102.1.2.

Table N1102.1.4 Equivalent U-factors. At the end of the table heading is a superscript "a" to indicate an associated footnote.

The table description with modifications, is listed below:

1. The table has eight rows with nine columns. The first row is a header with the following header columns: Climate zone, Fenestration U-factor, Skylight U-factor, Ceiling U-factor, Frame Wall U-factor, Mass Wall U-factor (with a superscript "b" to indicate an associated footnote), Floor U-factor, Basement Wall U-factor, and "Crawl Space Wall U-factor."
2. The second and third rows, entitled "1" and "2" under the column heading "Climate Zone" and continuing across all column headings, have been stricken from the code.
3. The fourth row, entitled "3" under the column heading "Climate Zone" has been modified in the subsequent columns as listed below:
 - (i) Under column heading "Fenestration U-factor" the requirement has been changed from "0.35" to "0.50."
 - (ii) Under column heading "Skylight U-factor" the requirement has been changed from "0.55" to "0.65."
 - (iii) Under column heading "Ceiling U-factor" the requirement has been changed from "0.030" to "0.035."
 - (iv) Under column heading "Frame Wall U-factor" the requirement has been changed from "0.060" to "0.082."
 - (v) Under column heading "Mass Wall U-factor" the requirement has been changed from "0.098" to "0.141."
4. The fifth row, entitled "4 except Marine" under the column heading "Climate Zone" has been modified in the subsequent columns as listed below:
 - (i) Under column heading "Skylight U-factor" the requirement has been changed from "0.55" to "0.60."
 - (ii) Under the column heading "Ceiling U-factor" the requirement has been changed from "0.026" to "0.030."
 - (iii) Under the column heading "Frame Wall U-factor" the requirement has been changed from "0.060" to "0.082."
 - (iv) Under the column heading "Mass Wall U-factor" the requirement has been changed from "0.098" to "0.141."

5. The sixth, seventh, and eighth rows, entitled "5 and Marine 4", "6", and "7 and 8" respectively, under column heading "Climate zone" and continuing across all subsequent columns, have been stricken from the table.
6. Footnote "a" reads as: Nonfenestration U-factors shall be obtained from measurements, calculation or an approved source.
7. Footnote "b" has been modified to read: When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as the frame wall U-factor in marine Zone 4 and in Zones 5 through 8.
8. Footnote "c." has been modified to read: Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.

SAMPLE: TABLE N1102.1.4 Equivalent U-Factors^a

CLIMATE ZONE	FENESTRATION U-FACTOR	SKYLIGHT U-FACTOR	CEILING U-FACTOR	FRAME WALL UFACTOR	MASS WALL UFACTOR ^b	FLOOR U-FACTOR	BASEMENT WALL UFACTOR	CRAWL SPACE WALL UFACTOR
3	0.50	0.65	0.035	0.082	0.141	0.064	0.360	0.477
4 except Marine	0.35	0.60	0.030	0.082	0.141	0.047	0.059	0.065

- a. Nonfenestration U-factors shall be obtained from measurements, calculation or an approved source.
- b. When more than half the insulation is on the interior, the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.10 in Zone 4 except Marine, and the same as all the frame wall U-factor in Marine Zone 4 and Zones 5 through 8.
- c. Basement wall U-factor of 0.360 in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.

Section N1102.2.1 (R402.2.1) Ceilings with attic spaces. Where Section N1102.1.2 would require R-38 in the ceiling, ~~installing R-30 over 100 percent of the ceiling area requiring~~ insulation shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, ~~where Section R1102.1.2 would require R-49 insulation in the ceiling, installing R-38 over 100 percent of the ceiling area requiring insulation~~ shall be deemed to satisfy the requirement for R-49 insulation wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section R1102.1.4 and the total UA alternative in Section R1102.1.5.

Section N1102.2.2 (R402.2.2) Ceilings without attic spaces. Where Section N1102.1.2 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section N1102.1.2 shall be limited to 500 square feet (46 square meters) or 20 percent of the total insulated ceiling area, whichever is less. ~~This reduction shall not apply to the U factor alternative approach in Section N1102.1.4 and the total UA alternative in Section N1102.1.5. Where Section N1102.1 would require insulation level R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling~~

assemblies shall be R-19. This reduction of insulation from the requirements of Section N1102.1 shall be limited to 500 square feet (46 square meters) or 20 percent of the total insulated ceiling area, whichever is less.

Section N1102.2.4 (R402.2.4) Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces such as attics and crawl spaces shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood-framed or equivalent baffle or retainer is required to be provided when loose-fill insulation is installed, the purpose of which is to prevent the loose-fill insulation from spilling into the living space when the attic is opened, and to provide a permanent means of maintaining the installed R-value of the loose-fill insulation.

~~**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~~

Section 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 walls having a heat capacity greater than or equal to 6 Btu/ft² x °F (123 Kj/M² x k).~~

Section N1102.2.6 (R402.2.6) Steel-frame ceilings, walls, and floors. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of Table N1102.2.6 or shall meet the U-factor requirements of Table N1102.1.4. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method. Exception: In climate zones 1 and 2, the continuous insulation requirements in the Table N1102.2.6 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center.

Section N1102.2.7 (R402.2.7) Walls with partial structural sheathing. This section has been stricken from the code.

Section N1102.2.8 (R402.2.8) Floors. Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

~~Exception: The floor framing cavity insulation shall be permitted to be in contact with the topside of the 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 Table 1102.1.2 and that extends from the bottom to the top of all perimeter floor framing members.~~

Section N1102.2.9 (R402.2.9) Basement walls. Exterior walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements

shall meet this requirement unless the floor overhead is insulated in accordance with Sections N1102.1.2 and N1102.2.8.

Table N1102.2.6 (R402.2.6) Steel-frame ceiling, wall and floor insulation (R-value).

The table heading has been modified to read: Table N1102.2.6 Steel-frame ceiling, wall and floor insulation (R-value).

The table description with modifications, is listed below:

1. The table has two columns and 23 rows. The first row contains the column headings: Wood frame R-value requirement and Cold-formed steel equivalent R-value (with a superscript "a" to indicate an associated footnote. The table is divided into five subcategories:
 - (i) Steel Truss ceilings (with a superscript "b" to indicate an associated footnote). Under this sub heading there are three rows for values R-30, R-38, and R49. No modifications have been made to this sub-category.
 - (ii) Steel Joist Ceilings (with a superscript "b" to indicate an associated footnote). Under this subheading there are two rows for values R-30 and R-38. No modifications have been made to sub-category.
 - (iii) Steel Frame Wall, 16 inches on center. This subheading has been modified to strike the "16 inches on center" portion of the heading. Under the subheading there are five rows for R-values that have been further modified. See section (B) for those modifications.
 - (iv) Steel Frame Wall, 24 inches on center. This subheading has been modified to strike the "24 inches on center" portion of the heading and to delete all the requirements in this sub-category.
 - (v) Steel Joist Floor. Under this subheading there are two rows for R-values R-13 and R-19. Both rows have been modified. See section (C) for those modifications.
2. Steel Frame Wall modifications. This subsection has five rows that have been modified.
 - (i) Row "R-13." This row has been modified to strike the associated items under the column entitled "Cold-formed steel equivalents" and replace them with: R-13 + 5 or R-15 +4 or R-21 + 3 or R-0 +10.
 - (ii) Row "R-13 +3." This row has been stricken from the table.
 - (iii) Row "R- 20." This row title and the associated items under the column entitled "Cold-formed steel equivalents" have been stricken from the table and replaced with the row title "R-19" and with the associated items under the column entitled "Coldformed steel equivalents" as R-13 +9 or R-19 +8 or R-25 +7.
 - (iv) (iv) Row "R-20 +5." This row has been stricken from the table.
 - (v) Row "R-21" This row has been modified to strike the associated items under the column entitled "Cold-formed steel equivalents" and replace them with R-13 +10 or R-19 + 9 or R-25 + 8.

3. Steel Joist Floor. This subsection has two rows which have been modified as follows:

- (i) Row "R-13." The associated items under the column entitled "Cold-formed steel equivalents" have been modified to read: R-19 in 2 x 6, R-19 + R-6 in 2 x 8 or 2 x 10.
- (ii) Row "R-19." The associated items under the column entitled "Cold-formed steel equivalents" have been modified to read: R-19 + R-6 in 2 x 6, or R-19 + R-12 in 2 x 8 or 2 x 10.

SAMPLE: TABLE N1102.2.6 STEEL-FRAME CEILING, WALL AND FLOOR INSULATION (R-VALUE).

a. Cavity insulation R-value is listed first, followed by continuous insulation R-value.

WOOD FRAME R-VALUE REQUIREMENT	COLD-FORMED STEEL EQUIVALENT R-VALUE ^a
Steel Truss Ceilings ^b	
R-30	R-38 or R-30 + 3 or R-26 +5
R-38	R-49 or R-38 +3
R-49	R-38 +5
Steel Joist Ceilings ^b	
R-30	R-38 in 2 x 4 or 2 x 6 or 2 x 8; R-49 in any framing
R-38	R-49 in 2 x 4 or 2 x 6 or 2 x 8 or 2 x 10
Steel Frame Wall	
R-13	R-13 + 5 or R-15 + 4 or R-21 +3 or R-0 +10
R-19	R-13 + 9 or R-19 + 8 or R-25 + 7
R-21	R-13 + 10 or R-19 + 9 or R-25 + 8
Steel Joist Floor	
R-13	R-19 in 2 x 6, R-19 +R-6 in 2 x 8 or 2 x 10
R-19	R-19 + R-6 in 2 x 6 or R-19 + R-12 in 2 x 8 or 2 x 10

b. Insulation exceeding the height of framing shall cover the framing.

(Reason: This table has been modified to bring it into alignment with the corresponding table in the 2009 IRC® by striking a portion of the table heading (R402.2.6), and by editing specific rows.)

Section N1102.2.13 (R402.2.13) Sunroom insulation. ~~Sunrooms enclosing conditioned spaces shall meet the insulation requirements of this code:~~ The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value

shall be R-13 in all zones. New walls separating the sunroom from the conditioned space shall meet the building thermal envelope requirements.

~~Exception: For sunrooms with thermal isolation, and enclosing conditioned spaces, the following exceptions to the insulation requirements of this code shall apply:~~

~~1) R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8.~~

~~2) The minimum wall R-value shall be R-13 in all climate zones. Walls separating a sunroom with a thermal isolation from conditioned space shall meet the building thermal envelope requirements of this code.~~

Section N1102.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the solar heat gain coefficient (SHGC) requirements.

~~Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table 1102.1.2 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~~

Section N1102.3.5 (R402.3.5) Sunroom fenestration. ~~Sunrooms enclosing conditioned spaces shall meet the fenestration requirements of this code:~~ For zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements.

~~**Exception:** For sunrooms with thermal isolation and enclosing conditioned space in Climate Zones 2 through 8, the maximum fenestration U-factor shall be 0.45 and the maximum skylight U-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.~~

Section N1102.3.6 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and solar heat gain coefficient (SHGC) in Table N1102.1.2.

Section N1102.4.1 (R402.4.1) Building thermal envelope. ~~The building thermal envelope shall comply with Sections N1102.4.1.1 and N1102.3.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction~~ be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier material, suitable film or solid material.

1. All joints seams and penetrations.
2. Site-built windows, doors and skylights.
3. Openings between window and door assemblies and their respective jambs and framing.
4. Utility penetrations.
5. Dropped ceilings or chases adjacent to the thermal envelope.
6. Knee walls.
7. Walls and ceilings separating the garage from conditioned spaces.
8. Behind tubs and showers on exterior walls.
9. Common walls between dwelling units.
10. Attic access openings.
11. Rim joists junction.
12. Other sources of infiltration.

Section N1102.4.1.1 (R402.4.1.1) Installation. ~~The components of the building thermal envelope as listed in Table N1102.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the building official, an approved third party shall inspect all components and verify compliance.~~ Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Sections N1102.4.1.2 or N1102.4.1.3.

Section N1102.4.1.2 (R402.4.1.2) Testing. ~~The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding five air changes per hour in Climate Zone 1 and 2, and three air changes per hour in Climate Zones 3 through 8. Testing shall be conducted in accordance with ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the code official, testing shall be conducted by an approved third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the code official. Testing shall be performed at any time after creation of all penetrations of the building thermal envelope.~~

~~During testing:~~

1. ~~Exterior windows and doors, fireplace and stove ... control measures.~~
2. ~~Dampers including exhaust, intake ... control measures.~~
3. ~~Interior doors, if installed ... shall be open.~~
4. ~~Exterior doors for continuous ... closed and sealed.~~
5. ~~Heating and cooling systems ... shall be turned off.~~
6. ~~Supply and return registers ... shall be fully open.~~

Tested air leakage rate is less than 7 ACH when tested with a blower door at a pressure of 50 Pascals (0.007 psi). Testing shall occur after rough in and after installation of penetrations of the building envelope including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
2. Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft and flu dampers;
3. Interior doors shall be open;
4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
5. Heating and cooling system(s) shall be turned off;
6. HVAC ducts shall not be sealed; and
7. Supply and return registers, shall not be sealed.

Section N1102.4.1.3 Visual Inspection has been added to the code. This section has been added to read: N1102.4.1.3 Visual Inspection. The items listed in Table N1102.4.1.1 applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation or contractor, shall inspect the air barrier and insulation. Where no approved party inspects these items the air barrier components shall be viewed as a part of the frame inspection or insulation inspection by the Authority Having Jurisdiction.

Section 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.~~

Table N1102.4.1.1 (R402.1.1) Air barrier and insulation installation. The table has been modified to read:

The first row contains the column headings: "Component", "Air Barrier Criteria" and "Insulation Installation Criteria." The table description with modifications, is listed below:

1. In Row 1, the second column, entitled "Air Barrier Criteria" has been modified to strike the words "Air Barrier" and is now entitled "Criteria."
2. In Row 1, the third column, entitled "Insulation Installation Criteria" has been stricken from the table. All corresponding content in all remaining sixteen rows has been stricken.
3. The following modifications have been made to Row 2:

- (i) In the first column, entitled "Component" the wording "General requirements" has been stricken and replaced with: Air barrier and thermal barrier.
 - (ii) In the second column, entitled "Criteria" the wording "A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed" has been stricken and replaced with the following: Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with the building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
4. The following modifications have been made to Row 3:
- (i) In the second column entitled, "Criteria," in the first sentence the words "The air", "shall be" and "in the air barrier" have been has been stricken and the sentence has been modified to read: Air barrier in any dropped ceiling/soffit substantially aligned with insulation and any gaps are sealed.
 - (ii) The second sentence "Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed" has been stricken and replaced with the following: Attic access (except unvented attic), knee wall door, or drop down door stair is sealed.
5. The following modification has been made to Row 4: In the second column, entitled "Criteria," the wording "The junction of the foundation sill plate shall be sealed. The junction of the top plate and the top of the exterior walls shall be sealed. Knee walls shall be sealed," has been stricken and replaced with the following: "Corners and headers are insulated. Junction of foundation and sill plate is sealed."
6. The following modifications have been made to Row 5:
- (i) In the first column, entitled "Component" the word "skylights" has been stricken.
The wording now reads: Windows and doors.
 - (ii) In the second column, entitled "Criteria," the words "and skylights and framing shall be" have been stricken. The word "are" has been added to the wording. The section has been modified to read: The space between window/door jambs and framing are sealed.
7. The following modification has been made to Row 6: In the second column entitled, "Criteria" the words "shall" and "the" have been stricken and the wording "are insulated and" has been added. The section has been modified to read: Rim joists are insulated and include an air barrier.
8. The following modification has been made to Row 7: In the second column entitled, "Criteria" the words "The," "shall be" and "insulation" have been stricken and the

words "Insulation is installed to maintain permanent contact with the underside of subfloor decking," "is" and "floor" have been added. The section has been modified to read: Insulation is installed to maintain permanent contact with the underside of subfloor decking. Air barrier is installed at any exposed edge of floor.

9. The following modification has been made to Row 8: In the second column entitled, "Criteria" the wording "shall be" has been stricken and the words "Insulation is permanently attached to walls" and "is" have been added. The section has been modified to read: Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with a Class I vapor retarder with overlapping joints taped.
10. The following modification has been made to Row 9: In the second column entitled, "Criteria" the wording "shall be" has been stricken. The wording "knee walls" and "are" have been added. The section has been modified to read: Duct shafts, utility penetrations, knee walls and flue shafts opening to exterior or unconditioned space are sealed. (K) The following modification has been made to Row 10 modifications are as follows: In the second column entitled "Criteria" the wording "Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation," has been added. Previously the section was blank. This section has been modified to read: Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation. (L) The following modification has been made to Row 11: In the second column entitled, "Criteria" the wording "shall be" has been stricken and replaced with the wording "is." The section has been modified to read: Air sealing is provided between the garage and conditioned space.
11. The following modifications have been made to Row 12:
 - (i) In the second column entitled, "Criteria" the wording "installed in the building thermal envelope shall be" has been stricken and replaced with "are air tight, IC rated and." The first sentence has been modified to read: Recessed light fixtures are airtight, IC rated and sealed to the drywall.
 - (ii) In the second column entitled, "Criteria" an exception has been added to read: Exception: Fixtures in conditioned space.
12. The following modification has been made to Row 13: In the second column entitled, "Criteria" the wording "Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing or sprayed/blown insulation extends behind piping and wiring" has been added to the previously blank section. The section has been modified to read: Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing or sprayed/blown insulation extends behind piping and wiring.
13. The following modification has been made to Row

14. In the second column entitled, "Criteria" the wording "The air barrier installed at exterior walls adjacent to" and "shall separate them from the showers and tubs" has been stricken. The wording "on exterior walls have insulation and an air barrier separating them from the exterior wall" have been added. The section has been modified to read: Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
15. The following modification has been made to Row 15: In the second column entitled, "Criteria" the wording "The," "shall be installed" and "electrical or communication" has been stricken. The wording "extends," "type" and "are" have been added. The section has been revised to read: Air barrier extends behind boxes or air-sealed boxes are installed.
16. The following modifications have been made to Row 16: A new row has been added to the table. The added information is listed below:
- (i) In the first row entitled, "Component" the wording "Common Wall" has been added. The section has been added to read: Common Wall.
 - (ii) In the second row entitled, "Component" the wording "Air barrier is installed in common wall between dwelling units" has been added. The section has been added to read: Air barrier is installed in common wall between dwelling units.
17. The following modification has been made to Row 17: In the second column entitled, "Criteria" the wording "thermal," "shall be" and "the" has been stricken and the word "are" has been added. The section has been modified to read: HVAC register boots that penetrate building envelope are sealed to subfloor and drywall.
18. The following modifications have been made to Row 18:
- (i) In the first column entitled, "Component" the wording "Concealed sprinklers" has been stricken and replace with "Fireplaces". The section has been modified to read:
Fireplaces.
 - (ii) In the second column entitled, "Criteria" the wording "when required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacture. Caulking or other adhesive sealants shall not be used to fill void between fire sprinkler cover plates and walls or ceilings" has been stricken. The wording "Fireplace walls include an air barrier" has been added. The section has been modified to read: Fireplace walls include an air barrier.

SAMPLE: TABLE N1102.4.1.1 AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	CRITERIA
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Air barrier and thermal barrier	Exterior thermal envelope insulation for framed walls is installed in substantial contact and continuous alignment with the building envelope air barrier. Breaks or joints in the air barrier are filled or repaired. Air-permeable insulation is not used as a sealing material. Air-permeable insulation is inside of an air barrier.
Air barrier in any dropped ceiling/soffit substantially aligned with insulation and any gaps are sealed.	Attic access (except unvented attic), knee wall door, or drop down door stair is sealed.
Walls	Corners and headers are insulated. Junction of foundation and sill plate is sealed.
Windows and doors	The spaces between window/door jambs and framing are sealed.
Rim joists	Rim joists are insulated and include an air barrier.
Floors (including above garage and cantilevered floors)	Insulation installed to maintain permanent contact with the underside of subfloor decking. Air barrier is installed at any exposed edge of floor.
Crawl space walls	Insulation is permanently attached to walls. Exposed earth in unvented crawl spaces is covered with a Class I vapor retarder with overlapping joints taped.
Shafts, penetrations	Duct shafts, utility penetrations knee walls and flue shafts opening to exterior or unconditioned space are sealed.
Narrow cavities	Batts in narrow cavities are cut to fit, or narrow cavities are filled by sprayed/blown insulation
Garage separation	Air sealing is provided between the garage and conditioned space.
Recessed lighting	Recessed light fixtures are airtight, IC rated and sealed to the drywall. Exception: Fixtures in conditioned space.
Plumbing and wiring	Insulation is placed between outside and pipes. Batt insulation is cut to fit around wiring and plumbing or sprayed/blown insulation extends behind piping and wiring.
Shower/tub on exterior wall	Showers and tubs on exterior walls have insulation and an air barrier separating them from the exterior wall.
Electrical/phone box on exterior walls	Air barrier extends behind boxes or air-sealed boxes are installed.
Common Wall	Air barrier is installed common wall between dwelling units.
HVAC register boots	HVAC register boots that penetrate building envelope are sealed to subfloor and drywall.
Fireplaces	Fireplace walls include an air barrier.

Section N1102.4.5 (R402.4.5) Recessed lighting. Recessed luminaries installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned space. All recessed luminaries shall be IC-rated and labeled as ~~having an air leakage rate not more than 2.0 cfm (0.944L/s) when tested in accordance with~~ meeting ASTM E 283 when tested at a 1.57 psi (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the

conditioned space to the ceiling cavity. All recessed luminaries shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling cover.

Section N1103.1 (R403.1) Controls (Mandatory). At least one thermostat shall be provided installed for each separate heating and cooling system.

Section N1103.1.1 (R403.1.1) Programmable thermostat. ~~The thermostat controlling the primary heating or cooling system of the~~ Where the primary heating system is a forced air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperature down to 55 degrees Fahrenheit (13 degrees Celsius) or up to 85 degrees Fahrenheit (29 degrees Celsius). The thermostat shall initially be programmed with a heating temperature set point no higher than 70 degrees Fahrenheit (21 degrees Celsius) and a cooling temperature set point no lower than 78 degrees Fahrenheit (26 degrees Celsius).

Section N1103.3.1 (R403.3.1) Insulation (Prescriptive). Supply 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.

Exception: Ducts or portions thereof located completely inside the building thermal envelope.

Section N1103.3.2 (R403.3.2) Sealing (Mandatory). Ducts, air handlers, ~~and~~ filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with ~~either the International Mechanical Code or~~ Section M1601.4. For duct systems with sheet metal plenums, Y's and supply boots, only liquid applied sealants complying with UL 181 BM (Mastic or similar) or equivalent method, shall be used to seal inner liners and start collars to plenum and any other seams in the system. Duct tightness shall be verified by one of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78L/s) per 100 square feet (9.29 square meters) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 square feet (9.29 square meters) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.
2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/s) per 100 square feet (9.29 square meters) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All registered boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/s) per 100 square feet (9.29 square meters) of conditioned floor space.

3. Visual verification by the Authority Having Jurisdiction or an approved agency.

Exception:

Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

~~Air impermeable spray foam products shall be permitted to be applied without additional joint seals~~

~~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 locked and button lock types.~~

Section N1103.3.4 (R403.3.4) Duct leakage (Mandatory). This section has been stricken from the code.

Section N1103.3.5 (R403.3.5) Building cavities (Mandatory). Building framing cavities shall not be used as supply ducts ~~or plenums~~.

Section N1103.5 (R403.5) Service hot water systems. Energy conservation measures for circulation service potable hot water systems shall be in accordance with Sections N1103.5.1 and N1103.5.2.

Section N1103.6 (R403.6) Mechanical ventilation (Mandatory). ~~The building shall be provided with ventilation that meets the requirements of Section M1507 of this code or the International Mechanical Code, as applicable, or with other approved means of ventilation.~~ Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

Section N1103.7 (R403.7) Equipment sizing and efficiency rating (Mandatory). Heating and cooling equipment shall be sized as specified in M1401.3 ~~in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.~~ New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

Section N1103.8 (R403.8) Systems serving multiple dwelling units (Mandatory). This section has been stricken from the code.

Section N1103.10 (R403.10) Pools and permanent spa energy consumption (Mandatory). ~~The energy consumption of pools and permanent spas shall be in accordance with Sections N1103.10.1 through N1103.10.4~~ Pools shall be provided with energy conservation measures in accordance with Sections N1103.10.2 through N1103.10.4.

Section N1103.10.2 (R403.10.2) Heaters. ~~The electric power to heaters shall be controlled by All pool heaters shall be equipped with a readily accessible on-off switch ~~that is an integral part of the heater mounted on the exterior of the heater, or external to and within 3 feet (914 mm) of the heater.~~ Operation of such switch shall not change the setting of the heater thermostat. ~~Such switches shall be in addition to a circuit breaker for the power to the heater to allow shutting off the heater without adjusting the thermostat setting.~~ Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights.~~

Section N1103.10.3 (R403.10.3) Time switches. ~~Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps. Heaters and pump motors that have built-in time switches shall be in compliance with this section.~~

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. ~~Pumps that operate~~ Where pumps are required to operate solar- and waste-heat-recovery pool heating systems.

Section N1103.10.4 (R403.10.4) Pool covers. ~~Outdoor heated pools and outdoor permanent spas shall be provided with a vapor retardant cover or other approved vapor retardant means.~~

~~**Exception:** Where more than 70 percent ... shall not be required.~~

Pools heated to more than 90 degrees Fahrenheit (32 degrees Celsius) shall have a pool cover with a minimum insulation value of R-12.

Section N1104.1 (R404.1) Lighting equipment (Mandatory). Not less than 75 percent of the lamps in permanently installed ~~lighting fixtures~~ luminaries shall be high-efficacy lamps or not less than 75 percent of the permanently installed ~~lighting fixtures~~ luminaries shall contain only high-efficacy lamps. Exception: Low-voltage lighting.

Section N1104.1.1 (R401.1) Lighting equipment (Mandatory). This section has been stricken from the code.

Section N1105 (R405) Simulated performance alternative (performance). This section, including all subsections and tables, has been stricken from the code.

Section N1106 (R406) Energy rating index compliance alternative. This section, including all subsections and tables, has been stricken from the code.

Section M1305.1.3 Appliances in attics. This section has been modified to read:

M1305.1.3 Appliances in attics. *Attics containing appliances shall be provided . . . {bulk of paragraph unchanged} . . . sides of the appliance where access is required. The clear access*

opening dimensions shall be a minimum of 20 inches by 30 inches (508 mm by 762 mm), or larger and large enough to allow removal of the largest appliance. A walkway to an appliance shall be rated as a floor as approved by the building official. As a minimum, for access to the attic space, provide one of the following:

1. A permanent stair.
2. A pull down stair with a minimum 300 lb (136 kg) capacity.
3. An access door from an upper floor level.

Exceptions:

1. The passageway and level service space are not required where the *appliance* can be serviced and removed through the required opening.
2. Where the passageway is unobstructed...*{remaining text unchanged}*

Section M1411.3 Condensate disposal. Condensate from all cooling coils or evaporators shall be conveyed from the drain pan outlet to ~~an approved place of disposal~~ a sanitary sewer through a trap, by means of a direct or indirect drain. *{remaining text unchanged}*

Section M1411.3.1 Auxiliary and secondary drain systems. *{bulk of paragraph unchanged}*

1. *{text unchanged}*
2. *{text unchanged}*
3. An auxiliary drain pan... *{bulk of text unchanged}*... with Item 1 of this section. A water level detection device may be installed only with prior approval of the building official.
4. A water level detection device... *{bulk of text unchanged}*... overflow rim of such pan. A water level detection device may be installed only with prior approval of the building official.

Section M1411.3.1.1 Water-level monitoring devices. On down-flow units ...*{bulk of text unchanged}*... installed in the drain line. A water level detection device may be installed only with prior approval of the building official.

Section M1502.3 Duct termination. Exhaust ducts shall terminate on the outside of the building. Exhaust duct terminations shall be in accordance with the dryer manufacturer's installation instructions. If the manufacturer's instructions do not specify a termination location, the exhaust duct shall terminate not less than 3 feet (914 mm) in any direction from the openings into buildings nor less than 12 inches from finished ground level or other obstruction. Exhaust duct terminations shall be equipped with a backdraft damper. Additionally, exhaust shall not terminate within 3 feet

(914 mm) of condensing units and a minimum 12 inches (305 mm) from the ground or any obstruction. Screens shall not be installed at the duct termination.

Section M1502.4.2 Duct installation. Exhaust ducts shall be supported at ~~intervals not to exceed 12 feet (3658 mm) and shall be secured in place.~~ 4 feet (1219 mm) intervals and secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. ~~Exhaust duct joints shall be sealed in accordance with Section M1601.4.1 and shall be mechanically fastened.~~ Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct.

Section 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 provided with makeup air at a rate approximately equal to the difference between the exhaust air rate and 400 cubic feet per minute. 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.

Exception:

Where all appliances in the house are of sealed combustion, power-vent, unvented, or electric, the exhaust hood system shall be permitted to exhaust up to 600 cubic feet per minute (0.28 m³/s) without providing makeup air. Exhaust hood systems capable of exhausting in excess of 600 cubic feet per minute (0.28 m³/s) shall be provided with a makeup air at a rate approximately equal to the difference between the exhaust air rate and 600 cubic feet per minute.

Table M1601.1.1 This table has been modified to read:

The description of the newly created table is listed below:

1. Row 1: Contains the three column headings as follows:
 - (i) Column 1 heading is entitled "Duct Size"
 - (ii) Column 2 heading is entitled "Galvanized" with two sub-columns; the first subcolumn is entitled "Minimum Thickness (inches)" and the second sub-column is entitled "Equivalent Galvanized Gage No."
 - (iii) Column 3 heading is "Approximate Aluminum B and S Gage."

2. Row 2: Under the first column entitled "Duct Size" are four sub-rows with corresponding dashes or figures that match to each sub-row in the second (including subcolumns) and third columns. Those sub-rows and figures are as follows:
 - (i) Sub-row 1 in column 1 lists "Round ducts and enclosed" and in column 2 entitled, "Galvanized," (sub-column "Minimum Thickness (inches) and sub-

- column "Equivalent Galvanized Gage No." and in column 3 entitled "Approximate Aluminum B and S Gage" a "dash" is listed instead of a figure.
- (ii) Sub-row 2 in column 1 lists "Rectangular ducts" and in column 2, entitled "Galvanized" (sub-column "Minimum Thickness (inches)" and sub-column "Equivalent Galvanized Gage No." and in column 3, entitled "Approximate Aluminum B and S Gage" a "dash" is listed instead of a figure.
 - (iii) Sub-row 3 in column 1 lists "14 inches or less" and in column 2, entitled "Galvanized," sub-column "Minimum Thickness (inches)" lists the figure "0.013", sub-column "Equivalent Galvanized Gage No." lists the figure "30," and column 3 entitled "Approximate Aluminum B and S Gage" lists the figure "26."
 - (iv) Sub-row 4 in column 1 lists "Over 14 inches" and in column 2, sub-column "Minimum Thickness (inches)" lists the figure "0.16", sub-column "Equivalent Galvanized Gage No." lists the figure "28" and column 3 entitled "Approximate Aluminum B and S Gage" lists the figure "24."
3. Row 3: Under the first column entitled "Duct Size" are three sub-rows with corresponding dashes or figures that match to each sub-row in the second column and the third column. Those sub-rows and figures are as follows:
 - (i) Sub-row 1 in column 1 lists "Exposed rectangular ducts" and in column 2, entitled, "Galvanized," (sub-column "Minimum Thickness (inches) and sub-column "Equivalent Galvanized Gage No." and in column 3 entitled "Approximate Aluminum B and S Gage" a "dash" is listed instead of a figure.
 - (ii) Sub-row 2 in column 1 lists "14 inches or less" and in column 2, sub-column "Minimum Thickness (inches)" lists the figure "0.016", sub-column "Equivalent Galvanized Gage No." lists the figure "28" and column 3 entitled "Approximate Aluminum B and S Gage" lists the figure "24."
 - (iii) Sub-row 3 in column 1 lists "Over 14 inches" and has a superscript "a" to indicate an associated footnote. In column 2, sub-column "Minimum Thickness (inches)" lists the figure "0.19", sub-column "Equivalent Galvanized Gage No." lists the figure "26" and column 3 entitled "Approximate Aluminum B and S Gage" lists the figure "22."
 4. Between the end of the table and Footnote "a" is the wording "For SI: 1 inch is equal to 25.4 mm."
 5. Footnote "a" has been added to read: a. Ductwork that exceeds 20 inches by dimension or exceeds a pressure of 1 inch water gage (250 pa) shall be constructed in accordance with SMACNA HVAC Duct Construction Standards Metal and Flexible.

SAMPLE: TABLE M1601.1.1 DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESS FOR SINGLE DWELLING UNITS

DUCT SIZE	GALVANIZED Minimum thickness (inches)	GALVANIZED Equivalent	APPROXIMATE ALUMINUM B AND S GAGE
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		Galvanized Gage No.	
Round ducts and enclosed	-	-	-
Rectangular ducts	-	-	-
14 inches or less	0.013	30	26
Over 14 inches	0.016	28	24
Exposed rectangular ducts	-	-	-
14 inches or less	0.016	28	24
Over 14 inches	0.019	26	22

For SI: 1 inch - 25.4 mm

- a. Duct work that exceeds 20 inches by dimension or exceeds a pressure of 1 inch water gage (250 Pa) shall be constructed in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible

Section M1601.4.1 Joints, seams, and connections. 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. Joints, longitudinal and transverse seams, and connection in ductwork shall be securely fastened and sealed with welds, gaskets, mastics (adhesive), 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 used to seal metallic and flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked "181 B-FX" for pressure-sensitive tape or "181 BM" 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 181B and shall be marked 181B-C. Crimps joints for round metallic ducts shall have a contact lap of not less than 1 inch (25 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 all ductwork shall be installed in accordance with the manufacturers' instructions.

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 exposed portion of the joint so as to prevent a hinge effect.
3. 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.

4. For duct systems with sheet metal plenums, Y's and supply boots, only liquid applied sealants complying with UL 181 BM (Mastic or similar) or equivalent method, shall be used to seal inner liners and start collars to plenum and any other seams in system.

Section M1903.1.1 Electrical requirements. In addition to the requirements of M1903.1, interconnection and all associated wiring shall be installed in accordance with NFPA 70, NEC®, 2014, Article 692 Fuel Cell Systems.

Section M2005.2 Prohibited locations. Fuel-fired water heaters shall not be installed in a room used as a storage closet. Water heaters located in a bedroom or bathroom shall be installed in a sealed enclosure so that *combustion air* will not be taken from the living space. Access to such enclosure may be from the bedroom or bathroom when through a solid door, weather-stripped in accordance with the exterior door air leakage requirements and equipped with an *approved* self-closing device. Installation of direct-vent water heaters within an enclosure is not required

Section 2401.2 is hereby added to read as follows:

Section G2401.2 Residential gas meter location. Gas meters shall be located as required by the gas supplier.

Section G2412.2.1 Footing. An eight inch (8") deep solid footer must be placed within natural soil under the supporting legs of the liquefied petroleum gas storage. The footer must exceed a minimum of three inches (3") from the furthest point of the supporting leg of the liquefied petroleum gas storage.

Section G2415.12 Minimum burial depth. G2415.12 Minimum burial depth. Underground piping systems shall be installed a minimum depth of ~~12 inches (305 mm)~~ 18 inches (457.5 mm) below grade, except as provided for in Section G2415.12.1.

Section G2415.13.1 Gas piping in same ditch with other piping. Gas piping may be installed in the same ditch with other piping such as water, sewer, electrical, or drainage piping provided the installation is approved and a minimum of six inches of horizontal separation of the different piping systems is maintained.

Section G2415.2.1 (404.2.1); add a second paragraph to read as follows:

Both ends of each section of medium pressure gas piping shall identify its operating gas pressure with an *approved* tag. The tags are to be composed of aluminum or stainless steel and the following wording shall be stamped into the tag:

"WARNING: 1/2 to 5 psi gas pressure - Do Not Remove"

Section CSST G2415.2.2 (404.2.2); add a third paragraph to read as follows:

Corrugated stainless steel tubing (CSST) shall be a minimum of 1/2" (18 EDH).

Section G2417.1 (406.1) General. Prior to acceptance and initial operation, all *pipng* installations shall be inspected and *pressure tested* to determine that the materials, design, fabrication, and installation practices comply with the requirements of this *code*. The permit holder shall make the applicable tests prescribed in Sections 2417.1.1 through 2417.1.5 to determine compliance with the provisions of this code. The permit holder shall give reasonable advance notice to the building official when the piping system is ready for testing. The equipment, material, power and labor necessary for the inspections and test shall be furnished by the permit holder and the permit holder shall be responsible for determining that the work will withstand the test pressure prescribed in the following tests.

Section G2420.1.4 (409.1.4) Valves in CSST installations. Shutoff valves installed with corrugated stainless steel (CSST) piping systems shall be supported with an approved termination fitting, or equivalent support, suitable for the size of the valves, of adequate strength and quality, and located at intervals so as to prevent or damp out excessive vibration but in no case greater than 12-inches from the center of the valve. Supports shall be installed so as not to interfere with the free expansion and contraction of the system's piping, fittings, and valves between anchors. All valves and supports shall be designed and installed so they will not be disengaged by movement of the supporting piping.

Section G2420.5.1 (409.5.1) Located within the same room. The shutoff valve ...*{bulk of paragraph unchanged}*... in accordance with the appliance manufacturer's instructions. A secondary shutoff valve must be installed within 3 feet (914 mm) of the firebox if appliance shutoff is located in the firebox.

Section G2421.1 (410.1) Pressure regulators. A line *pressure regulator* shall be ... *{bulk of paragraph unchanged}*... approved for outdoor installation. Access to regulators shall comply with the requirements for access to appliances as specified in Section M1305.

Exception: A passageway or level service space is not required when the regulator is capable of being serviced and removed through the required attic opening.

Section P2503.4 Building sewer testing. ~~The building sewer shall be tested by insertion of a test plug at the point of connection with the public sewer, filling the building sewer with water and pressurizing the sewer to not less than 10-foot (3048 mm) head of water. The test pressure shall not decrease during a period of not less than 15 minutes. The building sewer shall be watertight at all points. A forced sewer test shall consist of pressurizing the piping to a pressure of not less than 5 psi (34.5 kPa) greater than the pump rating and maintaining such pressure for not less than 15 minutes. The forced sewer shall be water tight at all points.~~

When required by local authority having jurisdiction, the building sewer shall be tested by insertion of a test plug at the point of connection with the public sewer, filling the building sewer with water and pressurizing the sewer to not less than 5-foot (1524 mm) head of water.

The test pressure shall not decrease during a period of not less than 15 minutes. The building sewer shall be water tight at all points.

A forced sewer test shall consist of pressuring the piping to a pressure of not less than 5 psi (34.5 kPa) greater than the pump rating and maintaining such pressure for not less than 15 minutes. The forced sewer shall be water tight at all points.

Section P2503.7 Water-supply system testing. Upon completion of the water-supply system or a section of it, the system or portion completed shall be tested and proved tight under a water pressure of not less than the working pressure of the system or, for piping systems other than plastic “PCV/CPVC”, by an air test of not less than 50 psi (345 kPa). This pressure shall be held for not less than 15 minutes. The water used for tests shall be obtained from a potable water source.

Section P2603.4 Pipes through foundation walls. A pipe that passes through a foundation wall shall be provided with a relieving arch, or a pipe sleeve shall be built into the foundation wall. The relieving arch or pipe sleeve shall conform to one of the materials and standards listed in Table P3002.1 (2). The sleeve shall be two pipe sizes greater than the pipe passing through the wall.

Section P2603.5.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall be not less than ~~{number} inches (mm)~~ 12 inches (305 mm) or as approved by the authority having jurisdiction below finished grade at the point of septic tank connection. Building sewers shall be not less than ~~{number} inches (mm)~~ 12 inches (305 mm) below grade.

Section P2704.1 General. Slip joints shall be made with an approved elastomeric gasket and shall be installed ~~only on the trap outlet, trap inlet and within the trap seal~~ from the fixture to within 18 inches (457 mm) downstream of the trap outlet seal. Fixtures with concealed slip-joint connections shall be provided with an access panel or utility space at least 12 inches (305 mm) in its smallest dimension or other approved arrangement so as to provide access to the slip-joint connections for inspection and repair.

Section P2709.2 Lining required. Where required, the adjoining walls and floor framing enclosed on-site built-up shower receptors shall be lined with one of the following materials:

1. Sheet lead.
2. Sheet copper.
3. Plastic liner that material complies with ASTM D 4068 or ASTM D 4551.
4. Hot mopping in accordance with Section P2709.2.3.
5. Sheet-applied load-bearing, bonded waterproof membranes that comply with ANSI A118.10.

The lining material shall extend not less than ~~2 inches (52 mm)~~ 3 inches (76 mm) beyond or around the rough jambs and not less than ~~2 inches (52 mm)~~ 3 inches (76 mm) above finished

thresholds. Sheet-applied load bearing, bonded waterproof membranes shall be applied in accordance with the manufacturer's installation instructions.

Section P2715.1 Laundry ~~tub~~ tray waste outlet. Each compartment of a laundry ~~tub~~ tray shall be provided with a waste outlet not less than 1 1/2 inches (38 mm) in diameter and a strainer or crossbar to restrict the clear opening of the waste outlet.

Section P2804.6.1 Requirements for discharge piping. The discharge piping serving a pressure relief valve, temperature relief valve or combination thereof shall:

1. Not be directly connected to the drainage system.
2. Discharge through an air gap ~~located in the same room as the water heater.~~
3. Not be smaller than the diameter of the outlet of the valve served and shall discharge full size to the air gap.
4. Serve a single relief device and shall not connect to piping serving any other relief device or equipment.

Exception: Multiple relief devices may be installed to a single T & P discharge piping system when approved by the administrative authority and permitted by the manufactures installation instructions and installed with those instructions.

5. Discharge ~~to the floor,~~ to an indirect waste receptor or to the outdoors.

[remainder unchanged]

Section P2902.5.3 Lawn irrigation systems. The potable water supply to lawn irrigation systems shall be protected against backflow by an atmospheric vacuum breaker, a pressure vacuum breaker assembly, or a reduced pressure principle backflow prevention assembly. Valves shall not be installed downstream from an atmospheric vacuum breaker. Where chemicals are introduced into the system, the potable water supply shall be against backflow by a reduced pressure principle backflow prevention assembly.

Any system installed with a chemical injection irrigation system must utilize a Reduced Pressure Principle Zone backflow device.

Section P2902.7 Protection of Individual water supplies. An individual water supply shall be located and constructed so as to be safeguarded against contamination in accordance with Section 608.17.1 through 608.17.8 of the *2015 International Plumbing Code*.

Section P2903.10 Hose bibb. Hose bibs subject to freezing, including the "frost-proof" type, shall be equipped with an accessible ~~stop-and-waste~~ valve inside the building so that they can be controlled and/or drained during cold periods.

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

Section P2906.4 Water service pipe. Water service pipe shall conform to NSF 61 and shall conform to one of the standards indicated in Table P2906.4. Water service pipe or tubing, installed underground and outside of the structure, shall have a minimum working pressure rating of not less than 160 pounds per square inch at 73 degrees Fahrenheit (1103 kPa at 23 degrees Celsius). Where the water pressure exceeds 160 pounds per square inch, (1103 kPa), piping material shall have a rated working pressure equal to or greater than the highest available pressure. Water service piping materials not third-party certified for water distribution shall terminate at ~~or before the full open valve located at the entrance to the structure~~ least 30 inches outside the exterior wall. Ductile iron water service piping shall be cement mortar lined in accordance with AWWA C104/A21.4.

Section P2914, Lawn Irrigation.

This Section has been newly created and entitled "**Section P2914 Lawn Irrigation.**"

Section P2914.1 General. The provisions of this appendix shall control the design and construction of swimming pools, spas and hot tubs installed in or on the lot of a one- or two-family dwelling.

P2914.2 Definitions.

Section P2914.2 Definitions. For the purposes of these requirements, the terms used shall be defined as follows and as set forth in this Section.

1. AIR GAP--A complete physical separation between the free flowing discharge end of a potable water supply pipeline and an open or non-pressure receiving vessel.
2. ATMOSPHERIC VACUUM BREAKER--An assembly containing an air inlet valve, a check seat, and an air inlet port. The flow of water into the body causes the air inlet valve to close the air inlet port. When the flow of water stops the air inlet valve falls and forms a check against back-siphonage. At the same time it opens the air inlet port allowing air to enter and satisfy the vacuum. Also known as an Atmospheric Vacuum Breaker Back-Siphonage Prevention Assembly.
3. BACKFLOW PREVENTION--The mechanical prevention of reverse flow, or back-siphonage, of non-potable water from an irrigation system into the potable water source.
4. BACKFLOW PREVENTION ASSEMBLY--Any assembly used to prevent backflow into a potable water system. The type of assembly used is based on the existing or potential degree of health hazard and backflow condition.

5. COMPLETION OF IRRIGATION SYSTEM INSTALLATION--When the landscape irrigation system has been installed, all minimum standards met, all tests performed, and the irrigator is satisfied that the system is operating correctly.
6. CONSULTING--The act of providing advice, guidance, review or recommendations related to landscape irrigation systems.
7. CROSS-CONNECTION--An actual or potential connection between a potable water source and an irrigation system that may contain contaminants or pollutants or any source of water that has been treated to a lesser degree in the treatment process.
8. DESIGN--The act of determining the various elements of a landscape irrigation system that will include, but not be limited to, elements such as collecting site specific information, defining the scope of the project, defining plant watering needs, selecting and laying out emission devices, locating system components, conducting hydraulics calculations, identifying any local regulatory requirements, or scheduling irrigation work at a site. Completion of the various components will result in an irrigation plan.
9. DESIGN PRESSURE. The pressure that is required for an emission device to operate properly. Design pressure is calculated by adding the operating pressure necessary at an emission device to the total of all pressure losses accumulated from an emission device to the water source.
10. EMISSION DEVICE. Any device that is contained within an irrigation system and that is used to apply water. Common emission devices in an irrigation system include, but are not limited to, spray and rotary sprinkler heads, and drip irrigation emitters.
11. EMPLOYED. Engaged or hired to provide consulting services or perform any activity relating to the sale, design, installation, maintenance, alteration, repair, or service to irrigation systems. A person is employed if that person is in an employer-employee relationship as defined by Internal Revenue Code, 26 United States Code Service, §3212(d) based on the behavioral control, financial control, and the type of relationship involved in performing employment related tasks.
12. HEAD-TO-HEAD SPACING. The spacing of spray or rotary heads equal to the manufacturer's published radius of the head.
13. HEALTH HAZARD. A cross-connection or potential cross-connection with an irrigation system that involves any substance that may, if introduced into the potable water supply, cause death or illness, spread disease, or have a high probability of causing such effects.
14. HYDRAULICS. The science of dynamic and static water; the mathematical computation of determining pressure losses and pressure requirements of an irrigation system.

15. INSPECTOR. A licensed plumbing inspector, water district operator, other governmental entity, or irrigation inspector who inspects irrigation systems and performs other enforcement duties for a municipality or water district as an employee or as a contractor.
16. INSTALLER. A person who actually connects an irrigation system to a private or public raw or potable water supply system or any water supply, who is with the City of Choctaw.
17. IRRIGATION PLAN. A scaled drawing of a landscape irrigation system which lists required information, the scope of the project, and represents the changes made in the installation of the irrigation system.
18. IRRIGATION SERVICES. Selling, designing, installing, maintaining, altering, repairing, servicing, permitting, providing consulting services regarding, or connecting an irrigation system to a water supply.
19. IRRIGATION SYSTEM. An assembly of component parts that is permanently installed for the controlled distribution and conservation of water to irrigate any type of landscape vegetation in any location, and/or to reduce dust or control erosion. This term does not include a system that is used on or by an agricultural operation as defined by Oklahoma Water Resources Board.
20. IRRIGATION TECHNICIAN. A person who works under the supervision of a licensed irrigator to install, maintain, alter, repair, service or supervise installation of an irrigation system, including the connection of such system in or to a private or public, raw or potable water supply system or any water supply, and who is required to be licensed with the City of Choctaw.
21. IRRIGATION ZONE. A subdivision of an irrigation system with a matched precipitation rate based on plant material type (such as turf, shrubs, or trees), microclimate factors (such as sun/shade ratio), topographic features (such as slope) and soil conditions (such as sand, loam, clay, or combination) or for hydrological control.
22. IRRIGATOR. A person who sells, designs, offers consultations regarding, installs, maintains, alters, repairs, services or supervises the installation of an irrigation system, including the connection of such system to a private or public, raw or potable water supply system or any water supply.
23. IRRIGATOR-IN-CHARGE. The irrigator responsible for all irrigation work performed by an exempt business owner, including, but not limited to obtaining permits, developing design plans, supervising the work of other irrigators or irrigation technicians, and installing, selling, maintaining, altering, repairing, or servicing a landscape irrigation system.

24. LANDSCAPE IRRIGATION. The science of applying the necessary amount of water to promote or sustain healthy growth of plant material or turf.
25. LICENSE. An occupational license that is issued by the City of Choctaw to an individual that authorizes the individual to engage in an activity
26. MAINLINE. A pipe within an irrigation system that delivers water from the water source to the individual zone valves.
27. MAINTENANCE CHECKLIST. A document made available to the irrigation system's owner or owner's representative that contains information regarding the operation and maintenance of the irrigation system, including, but not limited to: checking and repairing the irrigation system, setting the automatic controller, checking the rain or moisture sensor, cleaning filters, pruning grass and plants away from irrigation emitters, using and operating the irrigation system, the precipitation rates of each irrigation zone within the system, any water conservation measures currently in effect from the water purveyor, the name of the water purveyor, a suggested seasonal or monthly watering schedule based on current evapotranspiration data for the geographic region, and the minimum water requirements for the plant material in each zone based on the soil type and plant material where the system is installed.
28. MAJOR MAINTENANCE, ALTERATION, REPAIR, OR SERVICE. Any activity that involves opening to the atmosphere the irrigation main line at any point prior to the discharge side of any irrigation zone control valve. This includes, but is not limited to, repairing or connecting into a main supply pipe, replacing a zone control valve, or repairing a zone control valve in a manner that opens the system to the atmosphere.
29. MASTER VALVE. A remote control valve located after the backflow prevention device that controls the flow of water to the irrigation system mainline.
30. MATCHED PRECIPITATION RATE. The condition in which all sprinkler heads within an irrigation zone apply water at the same rate.
31. NEW INSTALLATION. An irrigation system installed at a location where one did not previously exist.
32. PASS-THROUGH CONTRACT. A written contract between a contractor or builder and a licensed irrigator or exempt business owner to perform part or all of the irrigation services relating to an irrigation system.
33. POTABLE WATER. Water that is suitable for human consumption.

34. PRESSURE VACUUM BREAKER. An assembly containing an independently operating internally loaded check valve and an independently operating loaded air inlet valve located on the discharge side of the check valve.
35. RECLAIMED WATER. Domestic or municipal wastewater which has been treated to a quality suitable for beneficial use, such as landscape irrigation.
36. RECORDS OF LANDSCAPE IRRIGATION ACTIVITIES. The irrigation plans, contracts, warranty information, invoices, copies of permits, and other documents that relate to the installation, maintenance, alteration, repair, or service of a landscape irrigation system.
37. REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY. An assembly containing two independently acting approved check valves together with a hydraulically operating mechanically independent pressure differential relief valve located between the two check valves and below the first check valve.
38. STATIC WATER PRESSURE. The pressure of water when it is not moving.
39. SUPERVISION. The on-the-job oversight and direction by a licensed irrigator who is fulfilling his or her professional responsibility to the client and/or employer in compliance with local or state requirements.
40. WATER CONSERVATION. The design, installation, service, and operation of an irrigation system in a manner that prevents the waste of water, promotes the most efficient use of water, and applies the least amount of water that is required to maintain healthy individual plant material or turf, reduce dust, and control erosion.
41. ZONE FLOW. A measurement, in gallons per minute or gallons per hour, of the actual flow of water through a zone valve, calculated by individually opening each zone valve and obtaining a valid reading after the pressure has stabilized. For design purposes, the zone flow is the total flow of all nozzles in the zone at a specific pressure.
42. ZONE VALVE. An automatic valve that controls a single zone of a landscape irrigation system.

Section P2914.3 Valid License Required. Any person who connects an irrigation system to the water supply within the City of Choctaw or to a private water system, must hold a valid license with the City of Choctaw.

Exemptions: A property owner is not required to be licensed if he or she is performing irrigation work in a building or on a premises owned or occupied by the person as the person's home. Home or property owner's property must have a current homestead exemption.

A home or property owner who installs an irrigation system must meet the standards contained within this section and the adopted codes regarding spacing, water pressure, spraying water over impervious materials, rain or moisture shut-off devices or other technology, backflow prevention and isolation valves.

Section P2914.4 Permit Required. Any person installing an irrigation system within the City of Choctaw is required to obtain a permit from the city. Any plan approved for a permit must be in compliance with the requirements of this chapter.

Exemptions:

1. An irrigation system that is that an on-site sewage disposal system; or
2. An irrigation system used on or by an agricultural operation.

Section P2914.5.1 Backflow Prevention Methods and Devices. All backflow prevention methods and devices must conform to Section P2902.5.3 “Lawn Irrigation System.”

Section P2914.5.2 Missing Backflow Prevention Protection. All irrigation systems found to be without backflow prevention protection that are connected to the potable water supply, must be connected to the potable water supply through an approved, properly installed backflow prevention assembly, before any major maintenance, alteration, repair, or service is performed.

Section P2914.6 Backflow Testing. The irrigator shall ensure the backflow prevention device is tested by a licensed plumber prior to being placed in service. The test results must be provided to the City of Choctaw and the irrigation system's owner or owner's representative within ten business days of testing of the backflow prevention device. Test results must be submitted on an approved Backflow Prevention Assembly Test and Maintenance Report form.

Section P2914.7 Water Conservation. All irrigation systems shall be designed, installed, maintained, altered, repaired, serviced, and operated in a manner that will promote water conservation

Section P2914.8.1 Irrigation Plan Design. An irrigator shall prepare an irrigation plan for each site where a new irrigation system will be installed. A paper or electronic copy of the irrigation plan must be on the job site at all times during the installation of the irrigation system. A drawing showing the actual installation of the system is due to each irrigation system owner after all new irrigation system installations. During the installation of the irrigation system, variances from the original plan may be authorized by the licensed irrigator if the variance from the plan does not:

1. Diminish the operational integrity of the irrigation system; or
2. Violate any requirements of the City of Choctaw or the State of Oklahoma regulations.

Section P2914.8.2 Irrigation Plan Drawing. All irrigation plans used for construction must be drawn to scale. The plan must include, at a minimum, the following information:

1. All major physical features and the boundaries of the areas to be watered;
2. North arrow;
3. A legend;
4. The zone flow measurement for each zone;
5. Location and type of each:
 - (i.) Controller;
 - (ii.) Sensor (for example, but not limited to, rain, moisture, wind, flow, or freeze).
6. Location, type, and size of each:
 - (i.) Water source, such as, but not limited to a water meter and point(s) of connection;
 - (ii.) Backflow prevention device;
 - (iii.) Water emission device, including, but not limited to, spray heads, rotary sprinkler heads, quick-couplers, bubblers, drip, or micro-sprays;
 - (iv.) Valve, including but not limited to, zone valves, master valves, and isolation valves;
 - (v.) Pressure regulation component; and
 - (vi.) Main line and lateral piping.
7. The scale used; and
8. The design pressure.

Section P2914.9 Irrigation Minimum Requirements. All irrigation design and installation must be constructed to the minimum requirement listed below:

Section P2914.9.1 Manufacturer's limitations. No irrigation design or installation shall require the use of any component, including the water meter, in a way which exceeds the manufacturer's published performance limitations for the component.

Section P2914.9.2 Spacing. The irrigation system shall have the proper spacing that are listed below:

1. The maximum spacing between emission devices must not exceed the manufacturer's published radius or spacing of the device(s). The radius or spacing is determined by referring to the manufacturer's published specifications for a specific emission device at a specific operating pressure.
2. New irrigation systems shall not utilize above-ground spray emission devices in landscapes that are less than 48 inches not including the impervious surfaces in either length or width and which contain impervious pedestrian or vehicular traffic surfaces along two or more perimeters. If pop-up sprays or rotary sprinkler heads are used in a new irrigation system, the sprinkler heads must direct flow away from any adjacent surface and shall not be installed closer than four inches from a hardscape, such as, but not limited to, a building foundation, fence, concrete, asphalt, pavers, or stones set with mortar.

3. Narrow paved walkways, jogging paths, golf cart paths or other small areas located in cemeteries, parks, golf courses or other public areas may be exempted from this requirement if the runoff drains into a landscaped area

Section P2914.9.3 Water Pressure. Emission devices must be installed to operate at the minimum and not above the maximum sprinkler head pressure as published by the manufacturer for the nozzle and head spacing that is used. Methods to achieve the water pressure requirements include, but are not limited to, flow control valves, a pressure regulator, or pressure compensating spray heads

Section P2914.9.4 Irrigation Zones. Irrigation Zones - Irrigation systems shall have separate zones based on plant material type, microclimate factors, topographic features, soil conditions, and hydrological requirements.

Section P2914.9.5 Matched Precipitation Rate. Zones must be designed and installed so that all of the emission devices in that zone irrigate at the same precipitation rate.

Section P2914.9.6 Impervious Surface. Irrigation systems shall not spray water over surfaces made of concrete, asphalt, brick, wood, stones set with mortar, or any other impervious material, such as, but not limited to, walls, fences, sidewalks, streets, etc.

Section P2914.9.7 Master Valve. When provided, a master valve shall be installed on the discharge side of the backflow prevention device on all new installations.

Section P2914.9.1.8 Pipe Primer and Solvent. All new irrigation systems that are installed using PVC pipe and fittings shall be primed with a purple colored primer prior to applying the PVC cement in accordance with the City of Choctaw adopted International Plumbing Code.

Section P2914.9.1.9 Moisture Shut-Off. All new automatically controlled irrigation systems must include sensors or other technology designed to inhibit or interrupt operation of the irrigation system during periods of moisture. Moisture shut-off technology must be installed according to the manufacturer's published recommendations. Repairs to existing automatic irrigation systems that require replacement of an existing controller must include a sensor or other technology designed to inhibit or interrupt operation of the irrigation system during periods of moisture or rainfall.

All new automatically controlled irrigation systems must include sensors or other technology designed to inhibit or interrupt operation of the irrigation system during periods of freezing weather.

Section P2914.9.1.10 Isolation Valve. All new irrigation systems must include an isolation valve between the water meter and the backflow prevention device. The isolation valve must be a ball valve and be equipped with a stainless steel handle. The ball valve

must be installed within a plastic valve or meter box large enough as not to hamper operation or repair.

Section P2914.9.1.11 Location of Irrigation System. Access shall be provided to backflow preventers, controllers, valves, lines, wire, etc.

Section P2914.9.1.11.1 Backflow Preventers. The location of the backflow preventers shall follow the regulations within this Section and the codes adopted in the International Plumbing Code.

Section P2914.9.1.11.1.1 Location of Backflow Preventers.

Placement of the Backflow Preventer must meet all manufacture's requirements.

Section P2914.9.1.11.1.2 Outdoor Enclosures for Backflow Prevention Device. Outdoor enclosures for backflow prevention devices shall comply with ASSE 1060. This includes any area outside of the building envelope.

Section P2914.9.1.11.1.3 Protection of backflow preventers. Backflow preventers shall not be located in areas subject to freezing except where they can be removed by means of unions or are protected by heat, insulation or both.

Section P2914.9.1.11.1.4 Relief port. The relief port or air gap fitting of the backflow preventer shall discharge to an approved indirect waste receptor or to the outdoor where it will not cause damage or create a nuisance.

Section P2914.9.1.11.2 Location of Irrigation lines and Water emission. The location of the irrigation piping and water emissions from the irrigation system shall follow the regulations within this Section and the codes adopted in the International Plumbing Code.

Section P2914.9.1.11.2.1 Public Right of Way and Roadway Easement.

Any part or portion of the irrigation piping is encourage to not be installed or located within the public right of way or public roadway easement.

Section P2914.9.1.11.2.2 Un-curbed Public Street. Any part or portion of the irrigation piping shall not be located within the public right of way or public roadway easement.

Section P2914.9.1.11.2.3 Curbed Public Street. The irrigation system is permitted to be placed within the public right of way or public roadway easement, but any water emitter must be a minimum of twelve inches (12") from the back of the concrete or asphalt curb.

Section P2914.9.1.11.2.4 Property Owner. If any portion of an irrigation system is located within a public right of way or public roadway easement must be noted on the irrigation plan and discussed with the irrigation system owner or owner's representative to address any safety or maintenance issues.

Section P2914.9.1.12 Depth Coverage of Piping. Piping in all irrigation systems must be installed according to this Section.

Section P2914.9.1.12.1 Depth of Main Irrigation Line. The piping must be installed to provide minimum depth coverage of eighteen inches (18") of select backfill, between the top of the pipe and the natural grade of the topsoil.

Section P2914.9.1.12.2 Depth of Secondary Irrigation Line. The piping must be installed to provide minimum depth coverage of twelve inches (12") of select backfill, between the top of the pipe and the natural grade of the topsoil.

Section P2914.9.1.12.2.1 Secondary in Bedrock. If the area being irrigated has rock at a depth of twelve inches (12") or less, select backfill may be mounded over the pipe. Mounding must be noted on the irrigation plan and discussed with the irrigation system owner or owner's representative to address any safety issues.

Section P2914.9.1.12.3. Obstruction of a Utility. If a utility, man-made structure, or roots create an unavoidable obstacle, which makes the required depth coverage requirement impractical, the piping shall be installed to provide a minimum of twelve inches (12") for a main irrigation line and eight inches (8") for a secondary irrigation line of select backfill between the top of the pipe and the natural grade of the topsoil. All trenches and holes created during installation of an irrigation system must be backfilled and compacted to the original grade.

Section P2914.9.1.13 Wiring Irrigation System. Underground electrical wiring used to connect an automatic controller to any electrical component of the irrigation system must be listed by Underwriters Laboratories as acceptable for burial underground.

Electrical wiring that connects any electrical components of an irrigation system must be sized according to the manufacturer's recommendation. Electrical wire splices which may be exposed to moisture must be waterproof.

Underground electrical wiring that connects an automatic controller to any electrical component of the irrigation system must be buried with a minimum of twelve inches (12") of select backfill.

Section P2914.10 Non-Potable Water. This section shall be added to read:

Section P2914.10.1 Non-Potable Water. Water contained within the piping of an irrigation system is deemed to be non-potable. No drinking or domestic water usage, such as, but not limited to, filling swimming pools or decorative fountains, shall be connected to an irrigation system.

A hose bib (an outdoor water faucet that has hose threads on the spout) is not permitted to be connected to an irrigation system for the purpose of providing supplemental water to an area.

Section P2914.10.2 Labeling and Marking Non-Potable Water. Non potable distribution piping shall be purple in color and shall be embossed or integrally stamped or marked with words: “CAUTION: NONPOTABLE WATER – DO NOT DRINK” or the piping shall be installed with a purple identification tape or wrap. Pipe identification shall be repeated at intervals not exceeding twenty-five (25) feet and at each point where the piping passed through a wall, floor or roof. Lettering shall be readily observable with the space where the piping is located.

Section P2914.10.2.1 Color. The color of the pipe identification shall be discernable and consistent throughout the area. The color purple shall be used to identify the non-potable water.

Section P2914.10.2.2 Identification Tape. Where used, identification tape shall be not less than three inches (3”) wide and have white or black lettering on a purple field stating “CAUTION: NONPOTABLE WATER – DO NOT DRINK.” Identification tape shall be installed on top of non-potable pipes and run continuously the entire length of the pipe.

Section P2914.11 Irrigator On-Site. An irrigation technician shall be on-site at all times while the landscape irrigation system is being installed. When an irrigator is not onsite, the irrigator shall be responsible for ensuring that a licensed irrigation technician is on-site to supervise the installation of the irrigation system.

Section P2914.12 Completion of Irrigation System Installation. Upon completion of the irrigation system, the irrigator or irrigation technician who provided supervision for the on-site installation shall be required to complete four items:

1. A final "walk through" with the irrigation system's owner or the owner's representative to explain the operation of the system;
2. The maintenance checklist on which the irrigator or irrigation technician shall obtain the signature of the irrigation system's owner or owner's representative and shall sign, date, and seal the checklist. If the irrigation system's owner or owner's representative is unwilling or unable to sign the maintenance checklist, the irrigator shall note the time and date of the refusal on the irrigation system's owner or owner's representative's signature line. The irrigation system owner or owner's representative will be given the original maintenance checklist and a duplicate copy of the maintenance checklist shall be

maintained by the irrigator. The items on the maintenance checklist shall include but are not limited to:

- (i.) the manufacturer's manual for the automatic controller, if the system is automatic;
 - (ii.) A seasonal (spring, summer, fall, winter) watering schedule based on either current/real time evapotranspiration or monthly historical reference evapotranspiration (historical ET) data, monthly effective rainfall estimates, plant landscape coefficient factors, and site factors;
 - (iii.) A list of components, such as the nozzle, or pump filters, and other such components; that require maintenance and the recommended frequency for the service; and
 - (iv.) The statement, "This irrigation system has been installed in accordance with all applicable state and local laws, ordinances, rules, regulations or orders. I have tested the system and determined that it has been installed according to the Irrigation Plan and is properly adjusted for the most efficient application of water at this time."
3. A permanent sticker which contains the irrigator's name, license number, company name, telephone number and the dates of the warranty period shall be affixed to each automatic controller installed by the irrigator or irrigation technician. If the irrigation system is manual, the sticker shall be affixed to the original maintenance checklist. The information contained on the sticker must be printed with waterproof ink.
 4. The irrigation plan indicating the actual installation of the system must be provided to the irrigation system's owner or owner representative.

Section P2914.13 Duties and Responsibilities of City Irrigation Inspectors. The irrigation inspector shall enforce the ordinance of the city, and shall be responsible for:

1. Verifying that the appropriate permits have been obtained for an irrigation system and that the irrigator and installer or irrigation technician, if applicable, are licensed;
2. Inspecting the irrigation system;
3. Determining that the irrigation system complies with the requirements of this chapter;
4. Determining that the appropriate backflow prevention device was installed, tested, and test results provided to the city;

5. Investigating complaints related to irrigation system installation, maintenance, alteration, repairs, or service of an irrigation system and advertisement of irrigation services; and
6. Maintaining records according to this chapter.

Section P2914.14 Fees. Irrigation and Backflow device permit fees shall be established in the fee schedule approved by the city council.

Section P2914.15 Irrigation System within the Public Right of Way or Public Roadway Easement. The City of Choctaw or the Choctaw Utilities Authority shall not be held liable for any damage of any system, which results from the installation or repair of, or improvement of any street or utility. Any homeowner or irrigator who installs a lawn sprinkler system between the curb and sidewalk or elsewhere within the public right of way or public roadway easement shall likewise hold the City of Choctaw and Choctaw Utilities Authority harmless against any claim or injury to persons or damage to property that any member of the public may suffer by reason of installation of said lawn sprinkling system within the public right of way.

Section P3003.2 Prohibited joints. Running threads and bands shall not be used in the drainage system. Drainage and vent piping shall not be drilled, tapped, burned, or welded. The following types of joints and connections shall be prohibited:

1. Cement or concrete.
2. Mastic or hot-pour bituminous joints.
3. Joints made with fittings not approved for the specific installation.
4. Joints between different diameter pipes made with elastomeric rolling O-rings.
5. Solvent-cement joints between different types of plastic pipe.
6. Saddle-type fittings.

Exception: Where approved by the jurisdiction, saddle-type fittings shall be permitted to connect the building sewer to a public sewer.

Section P3005.3 Horizontal drainage piping slope. Minimum horizontal drainage piping shall be installed in uniform alignment at uniform slopes not less than ¼ unit vertical in 12 units horizontal (2-percent slope) for 2 ½ inch (64 mm) diameter and less, and not less than 1/8 unit vertical in 12 units horizontal (1-percent slope) for diameters of 3 inches (76 mm) or more.

Maximum horizontal drainage piping shall be installed in uniform alignment at uniform slopes not less than 1 ¼ unit vertical in 12 units horizontal (10-percent slope) for the drainage piping.

Section P3003.9.2 Solvent cementing. Joint surfaces shall be clean and free from moisture. A purple primer that conforms to ASTM F 656 shall be applied. Solvent cement not purple in color and conforming to ASTM D 2564, CSA B 137.3 or CSA B181.2 shall be applied to all joint surfaces. The joint shall be made while the cement is wet, and shall be in accordance with ASTM D 2855. Solvent-cement joints shall be installed above or below ground.

Section P3008.1 Sewage backflow. Where the flood level rims of plumbing fixtures are connected to below the elevation of the manhole cover of the next upstream manhole in the a private or public sewer, the fixtures shall be protected by a backwater valve installed in the building drain, branch of the building drain or horizontal branch servicing such fixtures. ~~Plumbing fixtures having flood level rims above the elevation of the manhole cover of the next upstream manhole in the public sewer shall not discharge through a backwater valve.~~

~~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.~~

Table P3009.9 LOCATION OF SUBSURFACE IRRIGATION SYSTEM. The table has been modified to read and a note to table:

**TABLE P3009.9
LOCATION OF SUBSURFACE IRRIGATION SYSTEM**

ELEMENT	MINIMUM HORIZONTAL DISTANCE	
	STORAGE TANK (feet)	IRRIGATION DISPOSAL FIELD (feet)
Buildings	5	2 <u>5</u>
Lot line adjoining private property	5 <u>15</u>	5 <u>15</u>
<u>Private Water Wells</u>	50 ^a	100 <u>50</u> ^a
Streams and lakes	50	50 <u>25</u>
<u>French/Curtain Drain</u>	<u>15</u>	<u>15</u>
Seepage pits	5	5
Septic Tanks	0 ^b	5
Water Service	5	5
Public water main	10	10
<u>Public water well</u>	<u>300</u>	<u>300</u>

- a. Distance shall be one hundred feet (100') if the soil percolates one inch (1") in less than five (5) minutes or is classified as a Group 1 soil in the separation range as identified by ODEQ.
- b. Distance shall be 50 feet from neighboring property of their septic tank.

P3112.2 Installation. Traps for island sinks and similar equipment shall be roughed in above the floor and may be vented by extending the vent as high as possible, but not less than the drainboard height and then returning it downward and connecting it to the horizontal sink drain immediately downstream from the vertical fixture drain. The return vent shall be connected to the horizontal drain through a wye-branch fitting and shall, in addition, be provided with a foot vent taken off the vertical fixture vent by means of a wye-branch immediately below the floor and extending to the nearest partition and then through the roof to the open air or may be connected to other vents at a point not less than six (6) inches (152 mm) above the flood level rim of the fixtures served.

Drainage fittings shall be used on all parts of the vent below the floor level and a minimum slope of one-quarter (1/4) inch per foot (20.9 mm/m) back to the drain shall be maintained. The return bend used under the drain-board shall be a one (1) piece fitting or an assembly of a forty-five (45) degree (0.79 radius), a ninety (90) degree (1.6 radius) and a forty-five (45) degree (0.79 radius) elbow in the order named. Pipe sizing shall be as elsewhere required in this Code. The island sink drain, upstream of the return vent, shall serve no other fixtures. An accessible cleanout shall be installed in the vertical portion of the foot vent.

Section E3402.2 Penetrations of fire-resistance-rated assemblies. Electrical installations in hollow spaces, vertical shafts and ventilation or air-handling ducts shall be made so that the possible spread of fire products of combustion will not be substantially increased. Electrical penetrations ~~into or~~ through fire-resistance-rated walls, partitions, floors or ceilings shall be protected by approved methods to maintain the fire-resistance rating of the element penetrated. Penetrations of fire-resistance-rated walls shall be limited as specified in Section R302.4 (300.21). **E3403.3 Listing and labeling.** Electrical materials, components, devices, fixtures and equipment shall be listed for the application, in accordance with NFPA 70®, shall bear the label of an approved agency and shall be installed, and used, or both, in accordance with the manufacturer's installation instructions [110.3(B)].

(Reason: This section has been modified to add a requirement to comply with the 2014 Edition of the National Electrical Code® (NEC®, 2014), NFPA 70®.

Section 3404.7 Integrity of Electrical Equipment. This section has been modified to read:

Section 3404.7 Integrity of Electrical Equipment. Internal parts of electrical equipment, including busbars, wiring terminals, insulators and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners or abrasives, and corrosive residues. There shall not be any damaged parts that might adversely affect safe operation or mechanical strength of the equipment such as parts that are broken; bent; cut; deteriorated by corrosion, chemical action, or overheating. Foreign debris shall be removed from equipment. Damaged materials, equipment, appliances, and devices shall not be reused unless such elements have been reconditioned, tested, and placed in good and proper working condition and approved by a Nationally Recognized Testing Laboratory (NRTL), or by the manufacturer of the equipment. Electrical equipment damaged by natural or man-made events shall be reused only as recommended by the manufacturer of such equipment. [110.12(B)]

Section E3405.2 Working clearances for energized equipment and panelboards. Except as otherwise specified in Chapter 34 through 43, the dimension of the working space in the direction of access to panelboards and live parts of other equipment likely to require examination, adjustment, servicing or maintenance while energized shall be not less than 36 inches (914 mm) in depth. Distances shall be measured from the energized parts where such parts are exposed or from the enclosure front or opening where such parts are enclosed. In addition to the 36 inch dimensions (914 mm), the work space shall not be less than 30 inches (762 mm) wide in front of the electrical equipment and not less than the width of such equipment. The work space shall be clear and shall extend from the floor or platform of 36 inches (914 mm) to a height of 6.5 feet

(1981 mm) or the height of the equipment, whichever is greater. In all cases, the work space shall allow at least a 90-degree (1.57 rad) opening of equipment doors or hinged panels. Equipment associated with electrical equipment shall be permitted to extend not more than 6 inches (152 mm) beyond the front of the electrical equipment. [110.26 (A) (1), (2), (3)]

Exceptions: *Rest of the text within the 2015 IRC is unchanged.*

Section E3601.6.2 Service disconnect location. The service disconnecting means shall be installed at a readily accessible location either outside of a building or inside ~~nearest the point of entrance~~ within five feet (5') of the service conductors. Service disconnecting means shall not be installed in bathrooms. Each occupant shall have access to the disconnect serving the dwelling unit in which they reside.

Section E3702.3 Fifteen- and 20-ampere branch circuits. A 15- or 20-ampere branch circuit shall be permitted to supply lighting units, or other utilization equipment, or a combination of both. The rating of any one cord-and-plug connected utilization equipment not fastened in place shall not exceed 80 percent of the branch-circuit ampere rating. The total rating of utilization equipment fastened in place, other than luminaries, shall not exceed 50 percent of the branch-circuit ampere rating where lighting units, cord-and-plug connected utilization equipment is not fastened in place, or both, are also supplied. 20-ampere general purpose branch circuits shall supply a maximum of 10 outlets. 15-ampere general-purpose branch circuits shall supply a maximum of 8 outlets. [210.23(A) (1) and (2)]

E4206.4.1 Maximum voltage. Luminaries shall not ~~be installed for operation on supply circuits over 150 volts between conductors~~ operate above the low-voltage contact limit as defined in E4202.1. [680.23(A)(4)].