



# OKLAHOMA UNIFORM BUILDING CODE COMMISSION RULES

## 748 - Uniform Building Code Commission Adopted Codes

### International Residential Code®, 2015 Edition (IRC®, 2015) 748:20-5-1 through 748:20-5-28

#### NOTICES:

1. Section headers within this document marked "Revoked" do not revoke the current chapter associated with this revocation language. This language simply means the modifications made in a previous adoption have been "revoked" and the language reverts to the published content of the currently adopted code without amendment.
2. Through its rulemaking process, the OUBCC has adopted the first printing of the 2015 edition of the International Residential Code® (IRC®, 2015), which has been promulgated as a permanent rule pursuant to Oklahoma law at OAC 748:20-5-1. Errata found and corrected by the ICC®, if any, in a printing of the code other than the specific printing listed previously in this notice, has not been reviewed or approved by any OUBCC technical committee, adopted by the OUBCC itself, or promulgated as a permanent rule by the OUBCC pursuant to Oklahoma law.
3. The rules of the Oklahoma Uniform Building Code found on this website are **unofficial**. The official rules are published in The Oklahoma Administrative Code and The Oklahoma Register, as required by 75 O.S. § 250 et seq. To order an official copy of these rules, contact the Office of Administrative Rules at: (405) 521-4911.

## CHAPTER 20 - ADOPTED CODES

[Authority: 59 O.S. 59 § 1000.23]  
[Source: Codified 7-15-11]

### SUBCHAPTER 5. IRC® 2015

#### 748:20-5-1. Adoption of IRC® 2015

(a) The Oklahoma Uniform Building Code Commission (the "OUBCC") hereby adopts the International Residential Code®, 2015 Edition (IRC® 2015) as amended and modified in this subchapter to be the statewide minimum code for residential construction within the State of Oklahoma for one- and two-family dwellings and townhouses pursuant to 59 O.S. § 1000.23.

(b) The OUBCC through formal action expressly chose to adopt the IRC® 2015 as amended and modified in this subchapter, as the statewide minimum code for residential construction in the State of Oklahoma. In like manner, the OUBCC through formal action expressly chose to not adopt the International Residential Code®, 2012 Edition (IRC® 2012) for any purpose.

(c) As part of its 2015 code cycle, the International Code Council, Inc.® (ICC®) reorganized the format of certain of its model codes as it was foreseeable to ICC® that additional appendices will need to be added in the future as model regulations for new processes or operations are developed. The format reorganization was designed by ICC® to accommodate such future appendices by providing reserved (unused) appendices in certain of its model codes as part of its 2015 code cycle. The format reorganization is adopted by the OUBCC to the extent provided in this subchapter by the phrase "reserved for future use" inserted in lieu of titles for appendices.

(d) This material contains information which is proprietary to and copyrighted by International Code Council, Inc. The acronym "ICC" and the ICC logo are trademarks and service marks of ICC. ALL RIGHTS RESERVED.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### 748:20-5-2. Effect of Adoption

The IRC® 2015, as amended and revised by these rules, is hereby established and adopted as the statewide minimum code for residential building construction for one- and two-family dwellings and townhouses in Oklahoma pursuant to 59 O.S. § 1000.23, and may only be amended or altered by other jurisdictions pursuant to Oklahoma law and the administrative rules of the OUBCC as set forth in Title 748, Chapter 15 of the Oklahoma Administrative Code.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### 748:20-5-3. IRC® 2015 Appendices

(a) The OUBCC through formal action has chosen not to adopt appendices A through Y of the IRC® 2015 for inclusion in the statewide minimum code for residential construction in the State of Oklahoma. Appendices A through Y are informative and provide prescriptive requirements which are not mandatory unless specifically referenced in the adopting ordinance or order by other jurisdictions within the State of Oklahoma in accordance with 59 O.S. § 1000.29.

(b) The OUBCC hereby creates a new appendix V, entitled "Appendix V Automatic Fire Systems." Sections R312.2 entitled "One- and two-family dwellings automatic fire systems" and "R312.2.1 entitled "Design and installation" have been removed from Chapter Three of the IRC® 2015 and relocated to Appendix V, entitled "Appendix V, Automatic Fire Systems."

(c) The OUBCC hereby creates a new appendix W, entitled "Appendix S W Energy Efficiency." Section N1101.14 entitled "Certificate" has been removed from Chapter Eleven of the IRC® 2015 and relocated to Appendix W, entitled "Appendix W, Energy Efficiency."

(d) The OUBCC hereby creates a new appendix X, entitled "Appendix X, Swimming Pools, Spas and Hot Tubs." Appendix G has been carried forward from the previous adoption of IRC® 2009 and relocated to Appendix X, entitled "Appendix X, Swimming Pools, Spas and Hot Tubs."

(e) The OUBCC hereby creates a new Appendix Y, entitled "Appendix Y, Residential Tornado Provisions."

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16; Amended 34 Ok Reg 2107, eff 9-15-17]

#### **748:20-5-4. IRC® 2015 Provisions Adopted and Modified**

(a) All chapters and provisions within chapters, including exceptions, of the IRC® 2009 2015 not specifically addressed within these rules as being modified, deleted, moved or removed are hereby adopted without modification as the statewide minimum code for residential construction within the State of Oklahoma for one- and two-family dwellings and townhouses pursuant to 59 O.S. § 1000.23. Chapters and provisions within chapters, including exceptions adopted with modifications are specifically addressed in these rules.

(b) The ICC® has reserved Appendix Q for possible future use. The OUBCC has not adopted Appendix Q and the appendix is not considered part of the statewide minimum code for residential construction within the State of Oklahoma.

(c) To the extent any references in the IRC® 2015 as amended and modified in this sub-chapter are made to any other code or standard, the particular edition for that reference is defined in the referenced standards found in the IRC® 2015 as amended and modified in this sub-chapter and in the IRC® 2015 Chapter 44 entitled "Referenced Standards."

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-4.1. Participation in federal programs and/or federally funded or financed projects**

In order to maximize federal financial aid, assistance, participation, financing and/or funding in any public project(s) and/or federal financial aid, participation, funding for and participation in any federal program(s) by the State of Oklahoma, its agencies, public trusts and instrumentalities, or by any Oklahoma municipalities and other political subdivisions, that receive financial aid, assistance, participation, financing and/or funding for and participate in any federal program(s), the State of Oklahoma, its agencies and instrumentalities, and any Oklahoma municipalities and other political subdivisions, may cooperate with the United States Government and any agency or instrumentality thereof, in the manner authorized and provided by federal law and regulation and in doing so may perform all necessary functions and take all necessary actions for accomplishing such federal purposes and programs, including but not limited to, following and/or complying with federal laws, regulations and/or requirements arising from or related to federal financial aid, assistance, participation, financing and/or funding, in the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, improvement, expansion, operation, maintenance, removal, and demolition of buildings and structures or any appurtenances attached to such buildings or structures, notwithstanding any provisions of any and all uniform building codes and standards adopted by the OUBCC to the contrary.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-5. IRC® 2015 Chapter 1 Scope and Administration**

Chapter 1 of the Oklahoma adopted IRC® 2015, includes the following Preamble at the very beginning of the chapter:

(1) Pursuant to 59 O.S. § 1000.23, the OUBCC has adopted the IRC® 2015 as amended and revised by the OUBCC, as the statewide minimum code to be used by all entities for residential building construction in jurisdictions throughout and including the State of Oklahoma. However, the OUBCC's adoption of Chapter 1 "Scope and Administration" of the IRC® 2015 is for continuity purposes and the OUBCC's adoption of Chapter 1 recognizes the methods of best practice in fully implementing the statewide minimum code for residential construction.

(2) All provisions of the adopted IRC® 2015, including Chapter 1, as amended and revised by the OUBCC, are hereby established and adopted as the statewide minimum code for residential building construction for one- and two-family dwellings and townhouses in Oklahoma pursuant to 59 O.S. § 1000.23, which may only be amended or altered pursuant to Oklahoma law and the administrative rules of the OUBCC as set forth in Title 748, Chapter 15 of the Oklahoma Administrative Code. However, the provisions of Chapter 1 adopted herein are only intended to be in force and effect to the extent that the respective provisions do not conflict with State law or the lawful exercise of code administration and enforcement jurisdiction by entities empowered to do so pursuant to applicable law.

(3) The OUBCC's adoption of Chapter 1 in this manner is made with the recognition that the legal authority granting state and local code administration and enforcement jurisdictions the power and discretion to administer and enforce codes arises from Oklahoma laws governing those jurisdictions. Furthermore, the OUBCC also recognizes that many state and local code administration and enforcement jurisdictions have already created, or have the lawful authority to create, departments, offices and administrative policies pursuant to various applicable laws and other adopted model codes with "Scope and Administration" provisions similar to Chapter 1 of the adopted IRC® 2015.

(4) This limited adoption of Chapter 1 is made in recognition of the authority and discretion possessed by jurisdictions to administer and enforce building codes. Exercising such authority and jurisdiction in a manner inconsistent with Chapter 1 must be supported by Oklahoma law. Code administration and enforcement jurisdictions shall not use the OUBCC's limited adoption of Chapter 1 to circumvent the remainder of the requirements established by the Oklahoma adopted IRC® 2015 and the OUBCC will strongly oppose any such practice.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-5.1. IRC® 2015 Chapter 2 Definitions**

Chapter 2 of the IRC® 2015 is adopted with the following modifications:

(1) **BUILDING DRAIN.** This definition has been modified to align with the industry standard where the site sewer (civil) picks up 5 feet outside of the building. This definition has been modified to read: **BUILDING DRAIN.** 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.

(2) **[RE] HIGH-EFFICACY LAMPS.** This definition has been modified to strike a reference to Chapter 11, Section N1101.6 and add language regarding applicable requirements for energy efficiency. This definition has been modified to read: **[RE] HIGH-EFFICACY LAMPS.** Compact fluorescent lamps, light emitting diode (L.E.D.) type lamps, T-8 or smaller diameter linear fluorescent lamps, or lamps with a minimum efficacy of:

(A) 60 lumens per watt for lamps over 40 watts;

(B) 50 lumens per watt for lamps over 15 watts to 40 watts; and

(C) 40 lumens per watt for lamps 15 watts or less.

(3) [RE] INSULATED SHEATHING. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: [RE] INSULATED SHEATHING. An insulating board having a thermal resistance of not less than R-2 of the core material.

(4) NATIONALLY RECOGNIZED TESTING LABORATORY. This definition has been added to define a Nationally Recognized Testing Laboratory. This definition has been added to read: 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.

(5) [RB] ROOF RECOVER. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: [RB] ROOF RECOVER. The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

(6) SAFE ROOM. The definition of a "SAFE ROOM" has been added to define a building, structure or portion thereof, built to provide protection from severe wind storm events such as tornados or hurricanes and includes sub-definitions for a community safe room and other safe room. The definition has been added to read: 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.

(A) 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.

(B) 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.

(7) [RE] SKYLIGHT. This definition has been stricken from the code.

(8) [RE] SLEEPING UNIT. This definition has been stricken from the code.

(9) STORM SHELTER. The definition of a "STORM SHELTER" has been added to define a building, structure or portion thereof built to provide protection from severe wind storm events such as tornados or hurricanes. The definition has been added to read: 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.

(A) Community storm shelter. A storm shelter not defined as a "Residential storm shelter."

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

(10) [RB] SUNROOM. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: [RB] SUNROOM. A one-story

structure attached to a dwelling with a glazing area in excess of 40 percent of the gross area of the structure's exterior walls and roof.

(11) [RB] THERMAL ISOLATION. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: [RB] THERMAL ISOLATION. Physical and space conditioning separation from conditioned space(s) consisting of existing or new walls, doors, or windows. The conditioned space(s) shall be controlled as separate zones for heating and cooling or conditioned by separate equipment.

(12) [RE] U-FACTOR THERMAL TRANSMITTANCE. This definition has been modified to strike a reference to Chapter 11, Section N1101.6 and add language for applicable requirements for energy efficiency. This definition has been modified to read: [RE] U-FACTOR THERMAL TRANSMITTANCE. The coefficient of heat transmission (air to air) through a building envelope component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cool side air films (BTU/h x square feet x Fahrenheit).

(13) VENTILATION. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: VENTILATION. The natural or mechanical process of supplying conditioned or unconditioned air to, or removing such air from, any space.

(14) WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. This definition has been modified to strike a reference to Chapter 11, Section N1101.6. This definition has been modified to read: WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-6. IRC® 2015 Chapter 3 Building Planning**

Chapter 3 of the IRC® 2015 is adopted with the following modifications:

(1) 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:

(A) There are three columns in the table entitled "Exterior Wall Element," "Minimum Fire-Resistance Rating," and "Minimum Fire Separation Distance."

(B) Under the column entitled "Exterior Wall Element" the first row, entitled "Walls – Fire-resistance rated," has been modified to change the requirement in the column "Minimum Fire Separation Distance" from "less than 5 feet" to "less than 3 feet."

(C) Under the column entitled "Exterior Wall Element" the second row, entitled "Walls – Not fire-resistance rated," has been modified to change the requirement in the column "Minimum Fire Separation Distance" from "greater than or equal to 5 feet" to "greater than or equal to 3 feet."

(E) Under the column entitled "Exterior Wall Element" the third row, entitled "Projections – Not allowed," has been stricken from the table.

(F) Under the column entitled "Exterior Wall Element" the fourth row, entitled "Projections – Fire-resistance rated," has been modified to change the requirement in the column "Minimum Fire Separation Distance" from "greater than or equal to 2 feet to less than 5 feet" to "less than 3 feet."

(G) Under the column entitled "Exterior Wall Element" the fifth row, entitled "Projections – Not fire-resistance rated," has been modified to change the requirement in the column "Minimum Fire Separation Distance" from "greater than or equal to 5 feet" to "greater than or equal to 3 feet."

(H) Under the column entitled "Exterior Wall Element" the sixth row, entitled "Openings in walls – Not allowed," has not been modified from the requirements in the existing table.

(I) Under the column entitled "Exterior Wall Element" the seventh row, entitled "Openings in walls – 25 percent maximum of wall area," has been stricken from the code.

(J) Under the column entitled "Exterior Wall Element" the eighth row, entitled "Openings in walls – Unlimited," has been modified to change the requirement in the column "Minimum Fire Separation Distance" from "5 feet" to "greater than or equal to 3 feet."

(K) Under the column entitled "Exterior Wall Element" the ninth row, entitled "Penetrations – All," has been modified to change the requirement for the second sub-row in the column entitled "Minimum Fire Separation Distance" from "3 feet" to "greater than or equal to 3 feet."

(2) 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:

(A) There are three columns in the table entitled "Exterior Wall Element," "Minimum Fire-Resistance Rated," and "Minimum Fire Separation Distance."

(B) There are four rows entitled "Walls," "Projections", "Openings in Walls" and "Penetrations."

(C) The row entitled "Walls" under the column "Exterior Wall Elements" contains two sub-rows entitled "Fire-resistance rated" and "Not fire-resistance rated" No modifications have been made to this row and the associated sub-rows.

(D) The row entitled "Projections" under the column "Exterior Wall Elements" contains three sub-rows entitled "Not allowed," "Fire-resistance rated" and "Not fire-resistance rated." The sub-row entitled "Projections – Not allowed" has been stricken from the table. The remaining sub-rows have not been modified.

(E) The row entitled "Openings in walls" under the column "Exterior Wall Elements" contains two sub-rows entitled "Not allowed" and "Unlimited." No modifications have been made to this row and the associated sub-rows.

(F) The row entitled "Penetrations" under the column "Exterior Wall Elements" does not have any sub-rows and has not been modified.

(3) Section R303.1 Habitable rooms. The first exception to this section has been modified to change the aggregate glazing area when certain conditions are met. This section has been modified to read: 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:

(A) The glazed areas need not be openable where the opening is not required by Section R310 and an approved mechanical ventilation system 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.

(B) 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 6footcandles (65 lux) over the area of the room at a height of 30 inches (762 mm) above the floor level.

(C) 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.

(4) Section R311.1 Means of egress. This section has been modified to require garages to comply with the section requirements while allowing the means of egress from the garage to go through an adjacent dwelling. This section has been modified to read: 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 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.

(5) Section R311.2 Egress door. This section has been modified to require garages to comply with the section requirements. This section has been modified to read: R311.2 Egress door. Not less than one egress door shall be provided for each dwelling unit or 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.

(6) Section R311.7.5.1 Risers. This section has been modified to add a third exception that allows the top and bottom riser height to vary by 3/4 inch (19 mm). This section has been modified to read: 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:

(A) The openings between adjacent treads is not limited on spiral stairways.

(B) The riser height of spiral stairways shall be in accordance with Section R311.7.10.1.

(C) The top and bottom riser in each flight of stairs may vary by 3/4 inch (19 mm).

(7) Section R313.2 One- and two-family dwellings automatic fire systems. This section, including the exception, has been moved to the newly created Appendix V, entitled "Appendix V, Automatic Fire Systems" and is not adopted as a part of the statewide minimum code for residential construction within the State of Oklahoma. This section has



been renumbered in Appendix V to become V101.1. The section number R313.2 itself, will stay as part of this code for numbering alignment but will not have any requirements attached to it.

(8) Section R313.2.1 Design and installation. This section has been moved to the newly created Appendix V, entitled "Appendix V, Automatic Fire Systems" and is not adopted as a part of the statewide minimum code for residential construction within the State of Oklahoma. This section has been renumbered in Appendix V to become V101.2. The section number R313.2.1 itself, will stay as part of this code for numbering alignment but will not have any requirements attached to it.

(9) Section R314.2.2 Alterations, repairs and additions. This section has been modified to include minor electrical alterations, repairs and additions in the second exception to the section. This section has been modified to read: 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:

(A) 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.

(B) Installation, alteration, or repairs of electrical, plumbing or mechanical systems are exempt from the requirements of this section.

(10) Section R315.2.2 Alterations, repairs and additions. This section has been modified to include minor electrical alterations, repairs and additions in the second exception to the section. This section has been modified to read: 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:

(A) 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.

(B) Installation, alteration, or repairs of electrical, plumbing or mechanical systems are exempt from the requirements of this section.

(11) Section R323.1 General. This section has been modified to include above and below ground storm shelters and safe rooms and to limit the use of the terms storm shelter and safe room. This section has been modified to read: R323.1 General. This section applies to 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.

(12) R323.2 Definitions. This section has been added to show the following terms were added to Chapter Two of this code. This section shall read: R323.2 Definitions. The following definitions are defined in Chapter 2 of this code:

(A) SAFE ROOM

- (i) Community safe room.
- (ii) Other safe room.
- (B) STORM SHELTER
  - (i) Community storm shelter.
  - (ii) Residential storm shelter.

(13) Section R326.1 General. This section has been modified to remove the requirement for the construction of swimming pools, spas, and hot tubs to comply with the International Swimming Pool and Spa Code™ and to require compliance with Sections R326.2 through R326.4. This section has been modified to read: R326.1 General. Residential swimming pools, spas, and hot tubs requiring a permit shall comply with Sections R326.2 through R326.4.

(14) Section R326.2 Enclosure.\* This section has been added to provide enclosure requirements for residential swimming pools, spas, and hot tubs. This section has been added to read: R326.2 Enclosure. Swimming pools shall be completely enclosed by a fence or barrier not less than 4 feet (1290 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:

(A) Swimming pools, spas and hot tubs on lots in excess of 2 acres are exempt from the requirements.

(B) 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.

(15) Section R326.3 Gates. This section has been added to provide gate requirements for residential swimming pools, spas and hot tubs. This section has been added to read: 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.

(16) R326.4 Entrapment avoidance. This section has been added to require suction outlets to comply with ANSI/APSP-7. This section has been added to read: R326.4 Entrapment avoidance. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-7. IRC® 2015 Chapter 4 Foundations**

Chapter 4 of the IRC® 2015 is adopted with the following modifications:

(1) Section R402.2 Concrete. This section has been modified to include an exception for interior concrete slabs on grade and enclosed garage slabs to the requirement the concrete be air entrained. This section has been modified to read: 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.

(2) Table R403.1(1) Minimum width and thickness for concrete footings for light-frame construction (inches). This table has been modified to strike footnote "b" from underneath the table. The footnote area at the bottom of the table has been amended to read: a. Interpolation allowed. Extrapolation is not allowed.

(3) Table R403.1(2) Minimum width and thickness for concrete footings for light-frame construction with brick veneer (inches). This table has been modified to strike footnote "b" from underneath the table. The footnote area at the bottom of the table has been amended to read: a. Interpolation allowed. Extrapolation is not allowed.

(4) Table R403.1(3) Minimum width and thickness for concrete footings with cast-in-place concrete or fully grouted masonry wall construction (inches). This table has been modified to strike footnote "b" from underneath the table. The footnote area at the bottom of the table has been amended to read: a. Interpolation allowed. Extrapolation is not allowed.

(5) Figure R403.1(1) Plain concrete footings with masonry and concrete stem walls in SDC A, B, and C. The figure heading has been amended to include a superscript "g" to indicate an associated footnote. The "Notes" area at the bottom of this figure has been modified to add a note "g" to require reinforcement in the footings of structures in SDC A, B, and C. The "Notes" at the bottom of the figure have been amended to read:

(A) a. See Section 404.3 for sill requirements.

(B) b. See Section 403.1.6 for sill attachment.

(C) c. See Section R506.2.3 for vapor barrier requirements.

(D) d. See Section R403.1. for base.

(E) e. See Figure R403.1.3 for additional footing requirements for structures in SDC D0, D1, and D2 and townhouses in SDC C.

(F) f. See Section R408 for under-floor ventilation and access requirements.

(G) 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.

(6) Section R403.1.6 Foundation anchorage. This section has been modified to specify hand driven cut and concrete nails are not an approved fastener and include an exception for wood sole plates of braced wall panels anchorage under specific criteria. This section has been modified to read:

(A) 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.

(B) 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.

(C) 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 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:

- (i) 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).
  - (ii) 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).
  - (iii) 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.
- (7) Section R403.1.7.3 Foundation Elevation. This section has been stricken from the code.
- (8) Section R403.1.9. Protection of footings. This section has been added to provide protection to footings when trenching work is needed. This section has been added to read: 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.
- (9) Section R406.2 Concrete and masonry foundation waterproofing. This section has been modified to include an additional option for waterproofing. This section has been modified to read:
- (A) 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:
    - (i) Two-ply hot-mopped felts.
    - (ii) Fifty-five-pound (25 kg) roll roofing.
    - (iii) Six-mil (0.15 mm) polyvinyl chloride.
    - (iv) Six-mil (0.15 mm) polyethylene.
    - (v) Forty-mil (1 mm) polymer-modified asphalt.
    - (vi) Sixty-mil (1.5 mm) flexible polymer cement.
    - (vii) One-eighth-inch (3 mm) cement-based, fiber-reinforced waterproof coating.
    - (viii) Sixty-mil (1.5 mm) solvent-free liquid-applied synthetic rubber. (ix) Bentonite.
  - (B) 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 pargings 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).

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

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-8. IRC® 2015 Chapter 5 Floors**

Chapter 5 of the IRC® 2015 is adopted with the following modifications:

(1) Section R506.2.1 Fill. This section has been modified to provide fill lift measurements and delete a requirement for the slab and stem wall system to be designed by accepted engineering practice/standards by a design professional. This section has been modified to read: 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 48 inches (1220 mm) for clean sand or gravel and 8 inches (203 mm) for earth.

(2) Section R506.2.3 Vapor retarder. This section has been modified to allow for other industry accepted vapor retarders installed according to the manufacturer's specifications. This section has been modified to read: 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:

(A) Garages, utility buildings and other unheated accessory structures.

(B) For unheated storage rooms having an area less than 70 square feet (6.5 square meters) and carports.

(C) Driveways, walks, patios and other flatwork not likely to be enclosed and heated at a later date.

(D) Where approved by the building official, based on local site conditions.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-9. IRC® 2015 Chapter 6 Wall Construction**

Chapter 6 of the IRC® 2015 is adopted with the following modifications:

(1) Table R602.3(1) Fastening schedule. This table has been amended to add a footnote "a" to the table, applicable only to row 16 under the "Wall" section of the table after the words "Top or bottom plate to stud." This footnote has been added to read: a. When 7/16 inch structural sheathing is used with a minimum nailing spacing of 6 inches (152 mm) on the edge and 12 inches (305 mm) in the field, two- 3 inch x 0.131 inch nails are acceptable for end nail conditions for the top and bottom plate to stud connection.

(2) Table R602.3(3) Requirements for wood structural panel wall sheathing used to resist wind pressures with superscript "a, b, and c" to indicate an associated footnote. This table has been amended to add footnote "d" to the table heading to allow for alternative fasteners when certain criteria is met. The footnotes have been modified to read:

(A) a. Panel strength axis parallel or perpendicular to supports. Three-plywood sheathing with studs spaced more than 16 inches on center shall be applied with panel strength axis perpendicular to supports.

(B) b. Table is based on wind pressures acting toward and away from building surfaces in accordance with Section R301.2. Lateral bracing requirements shall be in accordance with Section R602.10.

(C) c. Wood structural panels with span ratings of Wall-16 or Wall-24 shall be permitted as an alternate to panels with a 24/0 span rating. Plywood siding rated at 16 o.c. or 24 o.c. shall be permitted as an alternate to panels with a 24/16 span rating. Wall-16 and Plywood siding 16 o.c. shall be used with studs spaced not more than 16 inches on center.

(D) d. The following alternative fasteners will be acceptable with a wind exposure category of C or D, 0.099 inch x 2-1/4 inches at 3 inches o.c. along the edge and 6 inches o.c. in the field. Or 0.113 inch x 2-3/8 inches at 6 inches o.c. along the edge and 12 inches o.c. in the field.

(3) R602.7.5 Supports for headers. This section has been modified to provide an exception that clarifies the section applies only when the building eave height is above 22 feet (6705 mm). The section has been modified to read: R602.7.5 Supports for headers. Headers shall be supported on each end with one or more jack studs or with approved framing anchors in accordance with Table R602.7(1) or R602.7(2). The full-height stud adjacent to each end of the header shall be end nailed to each end of the header with four-16d nails (3.5 inches x 0.135 inch). The minimum number of full-height studs at each end of a header shall be in accordance with Table R602.7.5. Exception: This section only applies for buildings with eave heights above 22 feet (6705 mm).

(4) Section R602.10.5 Minimum length of a braced wall panel. This section has been modified to allow for the portal frame to begin at 12 1/2 feet (3810 mm) from the wall line end for CS-PF method. This section has been modified to read: 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.

(5) Section R602.10.8 Braced wall panel connections. This section has been modified to include a fourth requirement to the section for anchoring wood sole plates to the building interiors on monolithic slabs using connectors with specific requirements. This section has been modified to read: R602.10.8 Braced wall panel connections. Braced wall panels shall be connected to the floor framing or foundations as follows:

(A) 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).

(B) 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).

(C) Connections of braced wall panels to concrete or masonry shall be in accordance with Section R403.1.6.

(D) 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).

(6) Section R602.12 Simplified wall bracing\* This section has been modified to change wall height, roof eave height, and wind speed conditions. This section has been modified to read: 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.

(A) 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.

(B) Floors shall not cantilever more than 24 inches (607 mm) beyond the foundation or bearing wall below.

(C) Wall height shall not be greater than 12 feet (3658 mm)

(D) The building shall have a roof eave-to-ridge height of 20 feet (6096 mm) or less.

(E) 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.

(F) The structure shall be located where the ultimate design wind speed is less than or equal to 115 mph (51.4 m/s), and the exposure category is B or C.

(G) 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.

(H) Cripple walls shall not be permitted in three-story buildings.

(7) Section R602.12.2 Sheathing materials. This section has been modified to change the minimum thickness of wood structural panels. This section has been modified to read: 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.

(A) Wood structural panels with a minimum thickness of 7/16 inch (11.11 mm) fastened in accordance with Table R602.3(3).

(B) Structural fiberboard sheathing with a minimum thickness of 1/2 inch (12.7 mm) fastened in accordance with Table R602.3(1).

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

## **748:20-5-10. IRC® 2015 Chapter 7 Wall Covering**

Chapter 7 of the IRC® 2015 is adopted with the following modifications:

(1) Section R703.4 Flashing. This section has been modified to clarify that 6-mil polyethylene sheeting is an approved corrosion-resistant flashing in certain circumstances and to clarify flashing above doors are not required where it is unlikely to have rain or other moisture accumulation occur above the door. This section has been modified to read: R703.4 Flashing. Approved corrosion-resistant flashing shall be applied shingle-fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. 6-mil polyethylene sheeting is an approved corrosion-resistant flashing when not exposed to UV rays. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashings in exterior walls shall comply with

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

(A) Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section R703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:

(i) The fenestration manufacturer's installation instructions and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, flashing to be installed per 1.2, 1.3, 1.4 or, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in a such a manner as to direct water to the surface of the exterior wall finish or to the water-resistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.

(ii) In accordance with the flashing design or method of a registered design professional.

(iii) In accordance with other approved methods.

(iv) Flashing above doors are not required where it is unlikely to have rain or other moisture accumulation occur above the door.

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

(C) Under and at the ends of masonry, wood or metal copings and sills.

(D) Continuously above all projecting wood trim.

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

(F) At wall and roof intersections.

(G) At built-in gutters.

(2) 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) a. See Sections R703.8.5, R703.8.6, and R703.4.

(B) b. See Section R703.2 and R703.8.4.

(C) c. See Section R703.8.4.2 and Table R703.8.4.

(D) d. See Section R703.8.3.

(E) 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) 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) 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.



(3) Figure R703.8.2.1 Exterior Masonry Veneer Support by Steel Angles. This figure has been modified to add a footnote "a" to the figure heading with a superscript "a" to indicate an associate footnote. Footnote "a" has been added to read: 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.

(4) Figure R703.8.2.2 Exterior Masonry Veneer Support by Roof Members. This figure has been modified to add a footnote "a" to the figure heading with a superscript "a" to indicate an associate footnote. Footnote "a" has been added to read: 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.

(5) Section R703.8.3.1 Allowable span. This section has been modified to provide guidance to builders using a typical for Oklahoma lintel. This section has been modified to read: 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 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.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-11. IRC® 2015 Chapter 8 Roof-Ceiling Construction**

Chapter 8 of the IRC® 2015 is adopted with the following modifications:

(1) Section R801.3 Roof drainage. This section has been stricken from the code.

(2) Section R802.3 Framing details. This section has been modified to change the ridge rafter requirements, provide a definition of a brace, and add an exception to the section. This section has been modified to read: R802.3 Framing details.

(A) 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.

(B) 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.

(C) Definition of brace includes:

(i).A triangular configuration of framing members with a horizontal tie and rafter members, (ii) 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.

(D) Exception: This exception helps address many situations where due to the design, building bracing is not achievable. This exception shall read: 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.

(3) Section R802.3.1 Ceiling joist and rafter connections. This section has been modified to reflect current framing practices. This section has been modified to read: R802.3.1 Ceiling joists and rafter connections.

(A) 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.

(B) 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 constructed in accordance with this code.

(C) 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).

(D) 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.

(4) Section R802.5 Allowable rafter spans. This section has been modified to provide guidance for builders framing rafters above the top sill of the wall system and provide an exception to require collar ties to be sized not less than the required size of the rafters they are connected to. This section has been modified to read: 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.

(5) Section R802.5.1 Purlins. This section has been modified to include an exception for spacing the braces at not more than 6 feet (1829 mm) when certain conditions are met. The

section has been modified to read: 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).

(6) Section R802.7.1.2 Ceiling joist taper cut. This section has been modified to include an exception to the section requirements for ceiling joists not carrying more than a 25 pound tributary load for limited attic storage. This section has been modified to read: R802.7.1.2 Ceiling joists taper cut. Taper cuts at the ends of the ceiling joists shall not exceed one-fourth the depth of the member in accordance with Figure R802.7.1.2. Exception: For ceiling joists not carrying more than 25 pounds of tributary load (limited attic storage) then taper cut at end of joint may be able to be increased to D/2.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-11.1. IRC® 2015 Chapter 9 Roof Assemblies**

Chapter 9 of the IRC® 2015 is adopted with the following modifications:

(1) Section R905.2.1 Sheathing requirements. This section has been modified to clarify solidly sheathed decking should be in accordance with Section R803 or to the asphalt shingle manufacturer's installation instructions. This section has been modified to read: 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.

(2) Section R905.2.8.5 Drip edge.\* This section has been modified to add an exception to the section when certain criteria is met. This section has been modified to read: R905.2.8.5 Drip edge. A drip edge shall be provided at eaves and rake edges of shingle roofs. Adjacent segments of drip edge shall be overlapped not less than 2 inches (51 mm). Drip edges shall extend not less than 1/4 inch (6.4 mm) below the roof sheathing and extend up back onto the roof deck not less than 2 inches (51 mm). Drip edges shall be mechanically fastened to the roof deck at not less than 12 inches (305 mm) o.c. with fasteners as specified in Section R905.2.5. Underlayment shall be installed over the drip edge along eaves and under the underlayment along rake edges. Exception: If a nominal 1 inch by 2 inch (25 mm by 51 mm) shingle mold is used, attached to the fascia and the starter course of shingles is extended a minimum of 1/4 inch (6.35 mm) and not more than 1 inch (25 mm) then a metal drip edge is not required.

(3) Section R908.3.1.1 Roof re-cover. This section has been modified to list a fourth condition for when a roof re-cover shall not be permitted. This section has been modified to read: R908.3.1.1. Roof re-cover. A roof re-cover shall not be permitted where any of the following conditions occur:

(A) 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.

(B) Where the existing roof covering is slate, clay, cement or asbestos-cement tile.

- (C) Where the existing roof has two or more applications of any type of roof covering.
- (D) Where the existing roof has one or more application of asphalt shingles additional applications of asphalt shingles shall not be permitted.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-11.2. IRC® 2015 Chapter 10 Chimneys and Fireplaces**

Chapter 10 of the IRC® 2015 is adopted with the following modification: Section R1005.7 Factory-built chimney offsets. This section has been modified to provide an exception for listed and labeled factory-built chimneys that are part of a fireplace and chimney assembly to be installed according to the manufacturer's installation instructions. This section has been modified to read: 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.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-12. IRC® 2015 Chapter 11 Energy Efficiency**

Chapter 11 of the IRC® 2015 is adopted with the following modifications:

- (1) N1101.1 Scope. This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by adding an exception that existed in the 2009 version and by striking the "Note" that appears underneath the section heading regarding which code the sections N1101.2 through N1105 were extracted from. This section has been modified to read: 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.
- (2) Section N1101.2 (R101.3) Intent. This section has been stricken from the code.
- (3) Section N1101.3 (R101.5.1) Compliance materials. This section has been stricken from the code.
- (4) Section N1101.4 (R102.1.1) Above code programs. This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R102.1.1), and by striking the language requiring mandatory requirements. This section has been modified to read: N1101.4 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 chapter.
- (5) Section N1101.5 (R103.2) Information on construction documents. This section has been stricken from the code.
- (6) Section N1101.5.1 (R103.2.1) Thermal envelope depiction. This section has been stricken from the code.
- (7) Section N1101.6 (R202) Defined Terms. This section and all associated terms and definitions have been stricken from the code.
- (8) Section N1101.7 (R301.1) Climate zones. This section has been stricken from the code.
- (9) Section N1101.7.1 (R301.2) Warm humid counties. This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by striking a portion of the

section heading (R301.2). This section has been modified to read: N1101.7.1 Warm humid counties. Warm humid counties are identified in Table N1101.7 by an asterisk.

(10) Section N1101.7.2 (R301.3) International climate zones. This section has been stricken from the code.

(11) Section N1108 (R301.4) Tropical climate zone. This section has been stricken from the code.

(12) Figure N1101.7 (R301.1) Climate zones. This figure has been modified to bring it in line with the corresponding section in the 2009 IRC® by striking a portion of the figure heading, (R301.1). This figure heading has been modified to read: Figure N1101.7 Climate zones.

(13) Table N1101.7 (R301.1) Climate zones, moisture regimes, and warm-humid designations by state, county and territory. This table has been modified to bring it in line with the corresponding table in the 2009 IRC® by striking a portion of the table heading, (R301.1) and by striking all states, counties and territories other than the state and counties of the State of Oklahoma. This table heading has been modified to read: Table N1101.7 Climate zones, moisture regimes, and warm-humid designations by state, county and territory.

(14) Table N1101.7.2(1) [R302.3.(1)] International climate zone definitions. This table has been stricken from the code.

(15) Table N1101.7.2(2) [R301.3(2)] International climate zone definitions. This table has been stricken from the code.

(16) Section N1101.9 (R302.1) Interior design conditions. This section has been stricken from the code.

(17) Section N1101.10 (R303.1) Identification. This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R303.1), and by requiring compliance with the chapter instead of the code. This section has been modified to read: N1101.10 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this chapter.

(18) Section N1101.10.1 (R303.1.1) Building thermal envelope insulation. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R303.1.1), and by replacing the words "greater in width" with "or more wide", "insulated siding" with "sprayed polyurethane foam (SPF) insulation", "certification" with "certificate" in the last two sentences, and by adding wording regarding the installed thickness of sprayed polyurethane foam. This section has been modified to read: N1101.10.1 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 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 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.

(19) Section N1101.10.1.1 (R303.1.1.1) Blown or sprayed roof/ceiling insulation. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R303.1.1.1), and by replacing the wording "in

height" with "high", and "certification" with "certificate." This section has been modified to read: N1101.10.1.1 Blown or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least once for every 300 square feet (28 square meters) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with a minimum initial installed thickness with numbers not less than of 1 inch (25 mm) high. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed R-value shall be listed on the certificate provided by the insulation installer.

(20) Section N1101.10.2 (R303.1.2) Insulation mark installation. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R303.1.2). This section has been modified to read: Section N1101.10.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's R-value mark is readily observable upon inspection.

(21) Section N1101.10.3 (R303.1.3) Fenestration product rating.\* This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by deleting a portion of the section heading (R303.1.3), and by striking the exception and striking a requirement for visual transmittance. This section has been modified to read:

(A) 1101.10.3 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.

(B) 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).

(22) Table N1101.10.3(1) [R303.1.3(1)] Default glazed fenestration U-factors. This table heading has been modified to bring it in line with corresponding section in the 2009 IRC® by striking a portion of the table heading [R303.1.3(1)]. This table heading has been modified to read: Table N1101.10.3(1) Default glazed fenestration U-factors.

(23) Table N1101.10.3(2) [R303.1.3(2)] Default door U-factors. This table heading has been modified to bring it in line with corresponding section in the 2009 IRC® by striking a portion of the table heading [R303.1.3(2)]. This table heading has been modified to read: Table N1101.10.3(2) Default door U-factors.

(24) Table N1101.10.3(3) [R303.1.3(3)] Default glazed fenestration SHGC and VT. This table heading has been modified to bring it in line with corresponding section in the 2009 IRC® by striking a portion of the table heading [R303.1.3(3)], and by striking all references to VT from the table and heading. This table has been modified to read: N1101.10.3(3). Default glazed fenestration SHGC. The second row of the table, entitled "VT" has been stricken.

(25) Section N1101.10.4 (R303.1.4) Insulation product rating. This section has been modified to bring it in line with corresponding section in the 2009 IRC® by striking a portion of the section heading (R303.1.4) and by striking language in reference to clarifying a requirement to the U.S. Federal Trade Commission R-value rule. This section has been modified to read: N1101.10.4 Insulation product rating. The thermal resistance (R-value) of insulation shall be determined in accordance with the 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).

(26) Section N1101.10.4.1 (R303.1.4.1) Insulated siding. This section has been stricken from the code.

(27) Section N1101.11 (R303.2). Installation. This section has been modified to bring it in line with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R303.2), and by requiring installation of all materials, systems and equipment meet the manufacturer's installation instructions and the provisions of the code. This section has been modified to read: N1101.11 Installation. All materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and the provisions of this code.

(28) Section N1101.11.1 (R303.2.1) Protection of exposed foundation installation. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading, (R303.2.1). This section has been modified to read: N1101.11.1 Protection of exposed foundation installation. Insulation applied to the exterior basement walls, crawlspace walls, and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistance protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

(29) Section N1101.12 (R303.3) Maintenance information. This section has been stricken from the code.

(30) Section N1101.13 (R401.2) Compliance. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R401.2) and by deleting all the requirements listed in the 2015 edition for this section and adding the compliance provisions from 2009 edition for this section. This section has been modified to read: N1101.13 Compliance. 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.

(31) Section N1101.13.1 (R401.2.1) Tropical zone. This section has been stricken from the code.

(32) Section N1101.14 (R401.3) Certificate (Mandatory). This section has been moved to the newly created Appendix W, entitled "Appendix W, Energy Efficiency" and is not adopted as a part of the statewide minimum code for residential construction within the State of Oklahoma. This section has been renumbered in Appendix W to become W101.1. The section number N1101.14 itself, will stay as part of the code for numbering alignment but will not have any requirements attached to it.

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

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

(35) Section N1102.1.2 (R402.1.2) Insulation and fenestration criteria. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R402.1.2). This section has been modified to read: N1102.1.2 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table N1102.1.2 based on the climate zone specified in Section N1101.7.

(36) Section N1102.1.3 (R402.1.3) R-value computation. This section has been modified to bring it in line with the corresponding section of the 2009 IRC® by deleting a portion of the section heading (R402.1.3), and by striking a requirement for reducing the manufacturer's labeled R-value on insulated siding. This section has been modified to read: N1102.1.3 R-value computation. Insulation material used in layers, such as framing cavity 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.

(37) Table N1102.1.2 (R402.1.2) Insulation and fenestration requirements by component. This table has been modified to bring it in line with corresponding table in the 2009 IRC® by striking a portion of the table heading (R402.1.2), and by striking specific rows and by editing and adding to the footnotes at the end of the table. The table has been modified to read: 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:

(A) 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).

(B) 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.

(C) 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 "1" has been added to indicate an associated footnote.

(D) 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."
- (E) 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.
- (F) 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.
- (G) Footnote "b." has been modified to read: The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
- (H) 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.
- (I) 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.
- (J) Footnote "e." There are no SHGC requirements in the Marine Zone.
- (K) Footnote "f." Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.7 and Table N1101.7.
- (L) Footnote "g." Or insulation sufficient to fill the framing cavity, R-19 minimum.
- (M) 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.
- (N) 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.
- (O) 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.
- (P) 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.
- (Q) 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.

(38) Table N1102.1.4 (R402.1.4) Equivalent U-Factors. This table has been modified to bring it in line with corresponding table in the 2009 IRC® by striking a portion of the table heading (R402.1.4), and by striking specific rows and by editing the footnotes at the end of the table. The table has been modified to read: 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:

(A) 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."

(B) 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.

(C) 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."

(D) 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."

(E) 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.

(F) Footnote "a" reads as: Nonfenestration U-factors shall be obtained from measurements, calculation or an approved source.

(G) 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.

(H) 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.

(39) Section N1102.1.4 (R402.1.4) U-factor alternative. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.1.4). This section has been modified to read: N1102.1.4 U-factor alternative. An assembly with a U-factor equal to or less than that specified in Table N1102.1.4 shall be permitted as an alternative to the R-value in Table N1102.1.2.

(40) Section N1102.1.5 (R402.1.5) Total UA alternative. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.1.5). This section has been modified to read: N1102.1.5 Total UA alternative. If the total building thermal envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table 1102.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1.2. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.

(41) Section N1102.2 (R402.2) Specific insulation requirements (Prescriptive). This section has been modified to bring it in alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R402.2) and (Prescriptive), and by striking the language associated with the section, leaving only the section title. This section has been modified to read: N1102.2 Specific insulation requirements.

(42) Section N1102.2.1 (R402.2.1) Ceilings with attic spaces. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.1), and by modifying a reference in the section and striking certain other portions of the section. This section has been modified to read: N1102.2.1 Ceilings with attic spaces. Where Section N1102.1.2 would require R-38 in the ceiling, R-30 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, R-38 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.

(43) Section N1102.2.2 (R402.2.2) Ceilings without attic spaces. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.2), and by adding clarifying language when the roof/ceiling assembly does not allow sufficient space for the required insulation. This section has been modified to read: N1102.2.2 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. 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.

(44) Section N1102.2.3 (R402.2.3) Eave baffle. This section has been stricken from the code.

(45) Section N1102.2.4 (R402.2.4) Access hatches and doors. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.4), and deleting the exception to the section. This section has been modified to read: N1102.2.4 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.

(46) Section N1102.2.5 (R402.2.5) Mass walls. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.5), and striking a requirement for other walls having a heat capacity greater than or equal to 6 Btu divided by square feet times Fahrenheit (123 kJ divided by square meters times K). This section has been modified to read: N1102.2.5 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.

(47) Section N1102.2.6 (R402.2.6) Steel-frame ceilings, walls, and floors. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.6), and by adding an exception for the reduction continuous insulation requirements in Table N1102.2.6 for climate zones 1 and 2 when certain conditions are met. This section has been modified to read: N1102.2.6 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.

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

(49) Section N1102.2.8 (R402.2.8) Floors. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.2.8), and striking an exception to the section. This section has been modified to read: N1102.2.8 Floors. Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

(50) Section N1102.2.9 (R402.2.9) Basement walls. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of

the section heading (R402.2.9), and by making the requirement applicable to the exterior walls of the basement. This section has been modified to read: N1102.2.9 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.

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

(A) 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 sub-categories:

(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.

(B) 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 "Cold-formed steel equivalents" as R-13 +9 or R-19 +8 or R-25 +7.

(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.

(C) 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.

(52) Section N1102.2.10 (R402.2.10) Slab-on-grade floors. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the section heading (R402.2.19). This section has been modified to read: N1102.2.10 Slab-on-grade floors. Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table N1102.1.2. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table N1102.1.2 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45 degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the building official as having a very heavy termite infestation.

(53) Section N1102.2.11 (R402.2.11) Crawl space walls. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section title (R402.2.11). This section has been modified to read: N1102.2.11 Crawl space walls. As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with this code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend not less than 6 inches (153 mm) up the stem wall and shall be attached to the stem wall.

(54) Section N1102.2.12 (R402.2.12) Masonry veneer. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section title (R402.2.12). This section has been modified to read: N1102.2.12 Masonry veneer. Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

(55) Section N1102.2.13 (R402.2.13) Sunroom insulation. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking and renaming portions of the section title and by striking portions of the section and the exception to the section and bringing the two requirements from the exception into the body of the section requirements. This section has been modified to read: N1102.2.13 Thermally isolated sunroom insulation. 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.

(56) Section N1102.3 (R402.3) Fenestration (Prescriptive). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R402.3) and (Prescriptive), and the language requiring compliance with Section N1102 and N1102.3.1 through N1102.4.5. This section has been modified to read: N1102.3. Fenestration.

(57) Section N1102.3.1 (R402.3.1) U-factor. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.3.1). This section has been modified to read: N1102.3.1 U-factor. An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements.

(58) Section N1102.3.2 Glazed fenestration SHGC. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.3.2), and by deleting language that allows dynamic glazing to satisfy the SHGC requirements when it meets specific criteria and by striking the exception to the section. This section has been modified to read: 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.

(59) Section N1102.3.3 (R402.3.3) Glazed fenestration exemption. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the section heading (R402.3.3). This section has been modified to read: N1102.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4 square meters) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section N1102.1.2. This exemption shall not apply to the U-factor alternative approach in N1102.1.4 and the total UA alternative approach in N1102.1.5.

(60) Section N1102.3.4 (R402.3.4) Opaque door exemption. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the section heading (R402.3.4). This section has been modified to read: N1102.3.4 Opaque door exemption. One side-hinged opaque door assembly up to 24 square feet (2.22 square meters) in area is exempted from the U-factor requirement in Section N1102.1.2. This exemption shall not apply to the U-factor alternative approach in Section N1102.1.4 and the total UA alternative in Section N1102.1.5.

(61) Section N1102.3.5 (R402.3.5) Sunroom fenestration. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking and renaming the section heading, and striking the requirement for the sunroom enclosing conditioned space to meet the fenestration requirements of the code, and striking a portion of the exception and moving the remainder of the exception into the code language for the section. This section has been modified to read: N1102.3.5 Thermally isolated sunroom U-factor. 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.

(62) Section N1102.3.6 Replacement fenestration. This section has been added to the code to add a requirement for replacement fenestration to meet the U-factor and SHGC requirements in Table N1102.2.6. This section has been added to read: 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.

(63) Section N1102.4 (R402.4) Air leakage (Mandatory). This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking portions of the section heading (R402.4) and (Mandatory), and by deleting the requirement for the building thermal envelope to be constructed to limit air leakage in accordance with the requirements of Sections R1102.4.1 through R1102.4.4. This section has been modified to read: N1102.4 Air leakage.

(64) Section N1102.4.1 (R402.4.1) Building thermal envelope. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the section heading (R402.4.1), and by striking the requirement for the building thermal envelope to comply with Sections N1102.4.1.1 and N1102.4.1.2 and adding requirements for the building thermal envelope to be durably sealed to limit infiltration and requiring several areas to be caulked, gasketed, weather-stripped or otherwise sealed with an air barrier. This section has been modified to read: N1102.4.1 Building thermal envelope. The building thermal envelope shall 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.

(A) All joints seams and penetrations.

(B) Site-built windows, doors and skylights.

(C) Openings between window and door assemblies and their respective jambs and framing.

(D) Utility penetrations.

(E) Dropped ceilings or chases adjacent to the thermal envelope.

(F) Knee walls.

(G) Walls and ceilings separating the garage from conditioned spaces.

(H) Behind tubs and showers on exterior walls.

(I) Common walls between dwelling units.

(J) Attic access openings.

(K) Rim joists junction.

(L) Other sources of infiltration.

(65) Section N1102.4.1.1 (R402.4.1.1) Installation. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking and renaming portions of the section heading and striking a requirement for the components of the building thermal envelope as listed in Table N1102.4.1.1 to be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1 and by adding a requirement for the building envelope air tightness and insulation installation be demonstrated to comply with one of the options given by Sections N1102.4.2.1 or N1102.4.2.2. This section has been modified to read: N1102.4.1.1 Air sealing and insulation. 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.

(66) Section N1102.4.1.2 (R402.4.1.2) Testing. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading, (R402.4.1.2); adding the word "option" to the section heading; deleting



requirements for the building or dwelling unit testing and verification to have an air leakage rate meeting certain criteria; and adding other testing requirements. This section has been modified to read: N1102.4.1.2 Testing option. 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:

- (A) Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;
- (B) Dampers shall be closed, but not sealed; including exhaust, intake, makeup air, back draft and flu dampers;
- (C) Interior doors shall be open;
- (D) Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;
- (E) Heating and cooling system(s) shall be turned off;
- (F) HVAC ducts shall not be sealed; and
- (G) Supply and return registers, shall not be sealed.

(67) 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.

(68) Section N1102.4.2. (R402.4.2) Fireplaces. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the heading (R402.4.2) and requiring new wood-burning fireplaces have outdoor combustion air. This section has been modified to read: N1102.4.2 Fireplaces. New wood-burning fireplaces shall have outdoor combustion air.

(69) Section N1102.4.3 (R402.4.3) Fenestration air leakage. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by deleting a portion of the section heading, (R402.4.3). This section has been modified to read: N1102.4.3 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L divided by s divided by square meters), and swinging doors no more than 0.5 cfm per square foot (2.5 L divided by s divided by square meters), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. Exception: Site-built windows, skylights, and doors.

(70) Section N1102.4.4 (R402.4.4) Rooms containing fuel burning appliances. This section has been stricken from the code.

(71) Table N1102.4.1.1 (R402.1.1) Air barrier and insulation installation. This table has been modified to bring it into alignment with the corresponding table in the 2009 IRC®. The table contains three columns and eighteen rows as published in the 2015 IRC®. The first row contains the column headings: "Component", "Air Barrier Criteria" and "Insulation Installation Criteria." The table description with modifications, is listed below:

- (A) In Row 1, the second column, entitled "Air Barrier Criteria" has been modified to strike the words "Air Barrier" and is now entitled "Criteria."
- (B) 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.
- (C) 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.
- (D) 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.
- (E) 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."
- (F) 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.
- (G) 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.
- (H) 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.

(I) 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.

(J) 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.

(M) 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.

(N) 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.

(O) 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.

(P) 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.

(Q) 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.
- (R) 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.
- (S) 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.
- (72) Section N1102.4.5 (R402.4.5) Recessed lighting. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R402.4.5), and by changing the air leakage rate requirements for recessed luminaries. This section has been modified to read: N1102.4.5 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 meeting ASTM E 283 when tested at 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.
- (73) Section N1102.5 (R402.5) Maximum fenestration U-factor and SHGC (Mandatory). This section has been stricken from the code.
- (74) Section N1103.1 (R403.1) Controls (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.1) and (Mandatory), and striking the word "provided" and adding the word "installed." This section has been modified to read: N1103.1 Controls. At least one thermostat shall be installed for each separate heating and cooling system.
- (75) Section N1103.1.1 (R403.1.1) Programmable thermostat. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the heading (R403.1.1), and making it a requirement for at least one thermostat to be programmable where the primary heating system is a forced air furnace. This section has been modified to read: N1103.1.1 Programmable thermostat. 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).

(76) Section N1103.1.2 (R403.1.2) Heat pump supplementary heat (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.1.2) and (Mandatory). This section has been modified to read: N1103.1.2 Heat pump supplementary heat. Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

(77) Section N1103.2 (R403.2) Hot water boiler outdoor temperature setback. This section has been stricken from the code.

(78) Section N1103.3 (R403.3) Ducts. This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking a portion of the section heading (R403.3) and by striking the requirement for ducts and air handlers to be in accordance with Sections N1103.3.1 through N1103.3.5. This section has been modified to read: Section N1103.3 Ducts.

(79) Section N1103.3.1 (R403.3.1) Insulation (Prescriptive). This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking portions of the section heading (R403.3.1) and (Prescriptive), and by requiring supply ducts in attics to be insulated to a minimum of R-8 and all other ducts to be insulated to a minimum of R-6. This section has been modified to read: N1103.3.1 Insulation. Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6. Exception: Ducts or portions thereof located completely inside the building thermal envelope.

(80) Section N1103.3.2 (R403.3.2) Sealing (Mandatory). This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking portions of the section heading (R403.3.2) and (Mandatory), and by requiring building cavities used as ducts to be sealed, striking a requirement for joints and seams to comply with the International Mechanical Code®, requiring duct tightness to be verified by one of two tests: rough-in or post construction, by deleting two exceptions to the section and to include the following exception: Visual inspection may be used instead of the rough-in test and post construction test. This section has been modified to read: N1103.2.2 Sealing. Ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with 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:

(A) 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.

(B) 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.

(C) Visual verification by the Authority Having Jurisdiction or an approved agency.

(D) Exception: Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

(81) Section N1103.3.2.1 (R403.2.1) Sealed air handler. This section has been stricken from the code.

(82) Section N1103.3.3 (R403.3.3) Duct testing (Mandatory). This section has been stricken from the code.

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

(84) Section N1103.3.5 (R403.3.5) Building cavities (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.3.5) and (Mandatory), and by prohibiting building cavities from being used as supply ducts. This section has been modified to read: N1103.3.5 Building cavities. Building framing cavities shall not be used as supply ducts.

(85) Section N1103.4 (R403.4) Mechanical system piping insulation (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.4) and (Mandatory), and by changing the R-value. This section has been modified to read; N1103.4 Mechanical system piping insulation. Mechanical system piping capable of carrying fluids above 105 degree Fahrenheit (41 degrees Celsius) or below 55 degrees Fahrenheit (13 degrees Celsius) shall be insulated to a minimum of R-2.

(86) Section N1103.4.1 (R403.4.1) Protection of piping insulation. This section has been stricken from the code.

(87) Section N1103.5 (R403.5) Service hot water systems. This section has been modified by striking a portion of the section heading (R403.5), amending the section heading to include the word "Circulation," and adding the wording "potable" to the text of the section to further define the system type. This section has been modified to read: N1103.5 Circulation service hot water systems from N1103.5.1 and N1103.5.2. Energy conservation measures for circulation service potable hot water systems shall be in accordance with Sections N1103.5.1 and N1103.5.2.

(88) Section N1103.5.1 (R403.5.1) Heated water circulation and temperature maintenance systems (Mandatory). This section has been modified to remove a portion of the section heading (R403.5.1). This section has been modified to read: N1103.5.1 Heated water circulation and temperature systems (Mandatory). Heated water circulation systems shall be in accordance with Section R1103.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R1103.5.1.2. Automatic controls, temperature sensors and pumps shall be accessible. Manual controls shall be readily accessible.

(89) Section N1103.5.1.1 (R403.5.1.1) Circulation systems. This section has been modified to remove a portion of the section heading (R403.5.1.1). This section has been modified to read: N1103.5.1.1 Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermo-syphon circulation systems shall be prohibited.

Controls for circulating hot water system pumps shall start the pump based on the identification of a demand for hot water within the occupancy. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water.

(90) Section N1103.5.1.2 (R403.5.1.2) Heat trace systems. This section has been modified to remove a portion of the section heading (R403.5.1.2). This section has been modified to read: N1103.5.1.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1 or UL 515. Controls for such systems shall automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.

(91) Section N1103.5.2 (R403.5.2) Demand recirculation systems. This section has been modified to strike a portion of the section heading (R403.5.2). This section has been modified to read: N1103.5.2 Demand recirculation systems. A water distribution system having one or more recirculation pumps that pump water from a heated water supply pipe back to the heated water source through a cold water supply pipe shall be a demand recirculation water system. Pumps shall have controls that comply with both of the following:

(A) The control shall start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture or sensing the flow of hot or tempered water to a fixture fitting or appliance.

(B) The control shall limit the temperature of the water entering the cold water piping to 104 degrees Fahrenheit (40 degrees Celsius).

(92) Section N1103.5.3 (R403.5.3) Hot water pipe insulation (Prescriptive). This section has been modified to strike a portion of the header (R403.5.3), and by changing the size of piping required to have insulation from 3/4 inch to 1 inch. This section has been modified to read: N1103.5.3 Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of R-3 shall be applied to the following:

(A) Piping 1 inch (25 mm) and larger in nominal diameter.

(B) Piping serving more than one dwelling unit.

(C) Piping located outside the conditioned space.

(D) Piping from the water heater to the distribution manifold.

(E) Piping located under a floor slab.

(F) Buried in piping.

(G) Supply and return piping in recirculation systems other than demand recirculation systems.

(93) Section N1103.5.4 (R403.5.4) Drain water heat recovery units. This section has been stricken from the code.

(94) Section N1103.6 (R403.6) Mechanical ventilation (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.6) and (Mandatory), and by requiring outdoor air intakes and exhausts to have automatic or gravity dampers that close when the ventilation system is not operating. This section has been modified to read: N1103.6 Mechanical ventilation. Outdoor air intakes shall have automatic or gravity dampers that close when the ventilation system is not operating.

(95) Section N1103.6.1 (R403.6.1) Whole-house mechanical ventilation system fan efficacy. This section has been stricken from the code.

(96) Section N1103.7 (R403.7) Equipment sizing and efficiency rating (Mandatory). This section has been modified by bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.7) and (Mandatory), and by requiring the heating and cooling equipment to be sized according to Section M1401.3. This section has been modified to read: N1103.7 Equipment sizing and efficiency rating. Heating and cooling equipment shall be sized as specified in M1401.3.

(97) Table N1103.6.1 (R403.6.1) Mechanical ventilation system fan efficacy. This table has been stricken from the code.

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

(99) Section N1103.9 (R403.9) Snow melt system controls (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading (R403.9) and (Mandatory). This section has been modified to read: N1103.9 Snow melt system controls. Snow- and ice-melting systems, supplied through energy service to the building shall include automatic controls capable of shutting off the system when the pavement temperature is above 50 degrees Fahrenheit (10 degrees Celsius), and no precipitation is falling and an automatic or manual control that will allow the shutoff when the outdoor temperature is above 40 degrees Fahrenheit (5 degrees Celsius).

(100) Section N1103.10 (R403.10) Pools and permanent spa energy consumption (Mandatory). This section has been modified to bring it into alignment with the corresponding section of the 2009 IRC® by striking portions of the section heading (R403.10) and (Mandatory), and by modifying the heading and the requirements in the section so the section is applicable only for pools. This section has been modified to read: N1103.10 Pools. Pools shall be provided with energy conservation measures in accordance with Sections N1103.10.2 through N1103.10.4.

(101) Section N1103.10.1 (R403.10.1) Residential pools and permanent residential spas. This section has been stricken from the code.

(102) Section N1103.10.2 (R403.10.2) Heaters. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R403.10.2), modifying the Section heading to include the word "Pool" and modifying the section to require all pool heaters to be equipped with a readily accessible on-off switch without adjusting the thermostat settings and prohibiting all pool heaters fired by natural gas or LPG to have continuously burning pilot lights. This section has been modified to read: N1103.10.2 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch 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.

(103) Section N1103.10.3 (R403.10.3) Time switches. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R403.10.3), and requiring time switches on all pool heaters and pumps that can automatically turn off the heater or pump. This section has been modified to read: N1103.10.3 Time switches. Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps. Exceptions:

(A) Where public health standards require 24-hour pump operation.



(B) Where pumps are required to operate solar- and waste-heat-recovery pool heating systems.

(104) Section N1103.10.4 (R403.10.4) Pool covers. This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R403.10.4), striking the exception to the section, and removing the requirement for heated pools to have a vapor retardant pool cover on or at the water surface. This section has been modified to read: N1103.10.4 Pool covers. Pools heated to more than 90 degrees Fahrenheit (32 degrees Celsius) shall have a pool cover with a minimum insulation value of R-12.

(105) Section N1103.11 (R403.11) Portable spas (Mandatory). This section has been stricken from the code.

(106) Section N1103.12 (R403.12) Residential pools and permanent residential spas. This section has been stricken from the code.

(107) Section N1104 (R404) Electrical power and lighting systems (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking portions of the section heading. This section has been revised to read: N1104 Lighting Systems.

(108) Section N1104.1 (R404.1) Lighting equipment (Mandatory). This section has been modified to bring it into alignment with the corresponding section in the 2009 IRC® by striking a portion of the section heading (R404.1) and to include the wording "luminaries" in place of "lighting fixtures" in the code language. This section has been modified to read: N1104.1 Lighting equipment. Not less than 75 percent of the lamps in permanently installed luminaries shall be high-efficacy lamps or not less than 75 percent of the permanently installed luminaries shall contain only high-efficacy lamps. Exception: Low-voltage lighting.

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

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

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

(112) Section N1107 (R501) Existing Buildings – General. This section, including all subsections, has been stricken from the code.

(113) Section N1108 (R502) Additions. This section, including all subsections, has been stricken from the code.

(114) Section N1109 (R503) Alterations. This section, including all subsections, has been stricken from the code.

(115) Section N1110 (R504) Repairs. This section, including all subsections, has been stricken from the code.

(116) Section N1111 (R505) Change of occupancy or use. This section, including all subsections, has been stricken from the code.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-13. IRC® 2015 Chapter 15 Exhaust Systems**

Chapter 15 is adopted with the following modifications:

(1) Section M1502.3 Duct termination. This section has been modified to add a requirement that exhaust ducts terminate a minimum of 12 inches (305 mm) above the ground or any obstruction. This section has been modified to read: 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.

(2) M1502.4.2 Duct installation. This section has been modified to prohibit ducts from being joined with any screws or similar fasteners that protrude into the inside of the duct and to change the length of support intervals from 12 feet to 4 feet. This section has been modified to read: M1502.4.2 Duct installation. Exhaust ducts shall be supported at 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. Ducts shall not be joined with screws or similar fasteners that protrude into the inside of the duct.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-13.1. IRC® 2015 Chapter 16 Duct Systems**

Chapter 16 of the 2015 IRC® is adopted with the following modifications:

(1) Table M1601.1.1 Duct construction minimum sheet metal thickness for single dwelling units has been stricken from the code and replaced with a newly created table with the same table heading. The newly created table contains three columns and three rows and a footnote. The description of the newly created table is listed below:

(A) 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 sub-column 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."

(B) 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 sub-columns) 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."
- (C) 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."
- (D) Between the end of the table and Footnote "a" is the wording "For SI: 1 inch is equal to 25.4 mm."
- (E) 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.
- (2) Section M1601.4.1 Joints, seams, and connections. This section has been modified to add a fourth exception for duct systems with sheet metal plenums, Y's and supply boots with liquid applied sealants. This section has been modified to read: M1601.4.1 Joints, seams and connections.
- (A) 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.
  - (B) 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.
  - (C) Closure systems used to seal all ductwork shall be installed in accordance with the manufacturers' instructions.

(D) Exceptions:

(i) Spray polyurethane foam shall be permitted to be applied without additional joint seals.

(ii) 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.

(iii) 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.

(iv) 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.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

**748:20-5-13.2. IRC® 2015 Chapter 19 Special Appliances, Equipment and Systems**

Chapter 19 of the IRC® 2015 is adopted with the following modification. Section M1903.1.1 Electrical requirements has been added to the code. This section has been added to read: 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.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

**748:20-5-14. IRC® 2015 Chapter 24 Fuel Gas**

Chapter 24 is of the IRC® 2015 adopted with the following modification: Section G2415.12 Minimum burial depth. This section has been modified to require all underground piping systems to be installed a minimum of 18 inches below grade. This section has been revised to read: G2415.12 Minimum burial depth. Underground piping systems shall be installed a minimum depth of 18 inches (457.5 mm) below grade, except as provided for in Section G2415.12.1.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

**748:20-5-15. IRC® 2015 Chapter 25 Plumbing Administration**

Chapter 25 of the IRC® 2015 is adopted with the following modifications:

(1) P2503.4 Building sewer testing. \* This section has been modified to clarify that the building sewer test is only necessary when the local authority having jurisdiction requires the testing to be done and to change the building sewer test height requirement from a 10-foot high test to a 5-foot high test. This section has been modified to read: P2503.4 Building sewer testing.

(A) 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 (1024 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.

(B) 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.

(2) P2503.7 Water-supply system testing. This section has been modified to delete the word "plastic" and replace it with the terms "PVC" and "CPVC." This section has been modified to read: 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 PVC or 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.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-16. IRC® 2015 Chapter 26 General Plumbing Requirements**

Chapter 26 of the IRC® 2015 is adopted with the following modifications:

- (1) Section P2603.4 Pipes through foundation walls. This section has been modified to add a requirement for the relieving arch or pipe sleeve to comply with the materials and standards listed in Table 3002.1(2). This section has been modified to read: 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.
- (2) Section P2603.5.1 Sewer depth. This section has been modified to include a depth for the septic tank connection unless otherwise approved by the authority having Jurisdiction. This section has been modified to read: P2603.5.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall be not less than 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 12 inches (305 mm) below grade.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-17. IRC® 2015 Chapter 27 Plumbing Fixtures**

Chapter 27 of the IRC® 2015 is adopted with the following modifications:

- (1) Section P2704.1 General. This section has been modified to allow installation of slip joints between the fixture to within 18 inches downstream of the trap outlet seal. This section has been modified to read: P2704.1 General. Slip joints shall be made with an approved elastomeric gasket and shall be installed 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.
- (2) Section P2709.2 Lining required. This section has been modified to clarify it is only effective where required and to change the distance the lining material must extend from 2 inches to 3 inches (51 mm to 76 mm). This section has been modified to read: P2709.2 Lining required.
  - (A) Where required, the adjoining walls and floor framing enclosed on-site built-up shower receptors shall be lined with one of the following materials:
    - (i) Sheet lead.
    - (ii) Sheet copper.
    - (iii) Plastic liner material complies with ASTM D 4068 or ASTM D 4551.
    - (iv) Hot mopping in accordance with Section P2709.2.3.

(v) Sheet-applied load-bearing, bonded waterproof membranes that comply with ANSI A118.10.

(B) The lining material shall extend not less than 3 inches (76 mm) beyond or around the rough jambs and not less than 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.

(3) Section P2715.1 Laundry tray waste outlet. This section has been modified to replace the word "tub" with the word "tray" in the section heading and section language. This section has been modified to read: P2715.1 Laundry tray waste outlet. Each compartment of a laundry 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.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-18. IRC 2009 Chapter 28 Water Heaters [REVOKED]**

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Revoked at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-19. IRC® 2015 Chapter 29 Water Supply and Distribution**

Chapter 29 of the IRC® 2015 is adopted with the following modifications:

(1) Section P2902.5.3 Lawn irrigation systems. This section has been modified to add a spill resistant backflow preventer as an option for protection. This section has been modified to read: 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, a spill resistance vacuum breaker 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.

(2) Section P2903.10 Hose bibb. This section has been modified to strike the requirement for a stop and waste type valve and the exception. This section has been modified to read: P2903.10 Hose bibb. Hose bibs subject to freezing, including the "frost-proof" type, shall be equipped with an accessible valve inside the building so that they can be controlled and/or drained during cold periods.

(3) Section P2904.1.1 Required sprinkler locations. This section has been modified to clarify sprinklers shall only be installed to protect all areas of a townhouse dwelling unit. This section has been modified to read: Section P2904.1.1 Required sprinkler locations. Sprinklers shall be installed to protect all areas of a townhouse dwelling unit.

(4) Section P2906.4 Water service pipe. This section has been modified to require piping materials not third-party certified for water distribution, to terminate at least 30 inches outside of the exterior wall. It has also been modified to strike the requirement of the termination to be before the full open valve located at the entrance to the structure. This section has been modified to read: 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 least 30 inches outside the exterior wall.

Ductile iron water service piping shall be cement mortar lined in accordance with AWWA C104/A21.4.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-20. IRC® 2015 Chapter 30 Sanitary Drainage**

Chapter 30 of the IRC® 2015 is adopted with the following modifications:

(1) Section P3003.2 Prohibited joints. This section has been modified to include an exception: for "Saddle-type" fittings. This section has been modified to read: 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:

(A) Cement or concrete.

(B) Mastic or hot-pour bituminous joints.

(C) Joints made with fittings not approved for the specific installation.

(D) Joints between different diameter pipes made with elastomeric rolling O-rings.

(E) Solvent-cement joints between different types of plastic pipe.

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

(2) Section P3003.9.2 Solvent cementing. This section has been modified to delete the exception that allows for primer to not be used under certain conditions. This section has been modified to read: 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.

(3) Section P3008.1 Sewage backflow. This section has been modified by striking the requirements of plumbing fixtures having flood level rims above the elevation of the next upstream manhole cover in the public sewer system and by deleting the exception. This section has been modified to read: P3008.1 Sewage backflow. Where the flood level rims of plumbing fixtures are below the elevation of the manhole cover of the next upstream manhole in the 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.

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-21. IRC 2009 Chapter 31 Vents [REVOKED]**

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Revoked at 33 Ok Reg 1852, eff 11-1-16]

### **748:20-5-22. IRC® 2015 Chapter 34 General Requirements (Electrical)**

Chapter 34 of the IRC® 2015 is adopted with the following modifications:

(1) Section E3402.2 Penetrations of fire-resistance-rated assemblies. This section has been modified to correct the reference section cited from R317.3 to R302.4 (300.21). The section has been modified to read: E3042.2 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 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).

(2) Section E3403.3 Listing and labeling. This section has been modified to add a requirement to comply with the 2014 Edition of the National Electrical Code® (NEC®, 2014), NFPA 70®. The section has been modified to read: 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)].

(3) Section 3404.7 Integrity of Electrical Equipment. This section has been modified to allow for the reuse of existing electrical equipment, rather than requiring new replacements when certain conditions are met. This section has been modified to read: E3404.7 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)]

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Amended at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-22.1. IRC 2015 Chapter 37 Branch Circuit and Feeder Requirements**

Chapter 37 of the IRC® 2015 is adopted with the following modification: Section E3702.3 Fifteen- and 20-ampere branch circuits, has been modified to provide adequate loads per circuit. This section has been modified to read: 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)]

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-23. IRC 2009 Chapter 40 Devices and Luminaries [REVOKED]**

[Source: Added at 28 Ok Reg 2122, eff 7-15-11; Revoked at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-24. IRC 2015® Chapter 42 Swimming Pools**

Chapter 42 of the IRC® 2015 is adopted with the following modification: Section 4206.4.1 Maximum voltage has been modified to limit the operation of luminaries in swimming pools to the low-voltage contact limits defined in Section E4202.1. This section has been modified to read: E4206.4.1 Luminaries shall not operate above the low-voltage contact limit as defined in E4202.1. [680.23(A)(4)].



[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-25. Appendix V, Automatic Fire Systems**

This appendix has been newly created and entitled "Automatic Fire Sprinkler Systems." The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or order.

(1) Section V101 General. This section heading has been added to clarify the sections of text applicable to installing residential fire sprinkler systems in one- and two-family dwellings.

This section heading has been added to read: V101 General.

(2) Section V101.1 One- and two-family dwellings automatic fire sprinkler systems. This section formerly numbered Section R313.2 has been moved into appendix V, entitled "Automatic Fire Sprinkler Systems" and specifies the provisions of this appendix shall apply to one- and two-family dwellings. It has been added to read: V101.1 One- and two-family dwellings automatic fire sprinkler 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.

(3) Section V101.2 Design and installation. This section, formerly numbered Section R313.2.1 has been moved into Appendix V, entitled "Automatic Fire Sprinkler Systems" and specifies the design and installation of automatic residential fire sprinkler systems shall comply with the provisions of this appendix and NFPA 13D. This section has been added to read: V101.2 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with the provisions of this appendix and NFPA 13D.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-26. Appendix W, Energy Efficiency**

This appendix has been newly created and entitled "Energy Efficiency." The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or order.

(1) W101 General. This section has been added to clarify the scope for this appendix. This section has been added to read: W101 General. This section has been added to specify the provisions of this appendix shall apply exclusively to the requirements for a Certificate listing energy efficiency components included in a residential dwelling unit.

(2) W101.1 Certificate. This section, formerly numbered N1101.14 has been moved into appendix W, entitled "Energy Efficiency." This section has been added to read: W101.1 Certificate. A permanent certificate shall be completed by the builder or registered design professional and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label, or other required labels. The certificate shall list the predominate R-values of insulation installed in or on the ceiling/roof, walls, foundation (slab, basement wall, crawl space wall/or floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric

heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-27. Appendix X, Swimming Pools, Spas, and Hot Tubs**

(a) This appendix has been newly created and entitled "Swimming Pools, Spas, and Hot Tubs." The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or order.

(b) X101 Swimming Pools, Spas and Hot Tubs. This section header has been added to clarify the sections of text that apply to the general requirements for swimming pools, spas and hot tubs.

This section has been added to read: X101 Swimming Pools, Spas and Hot Tubs.

(1) Section X101.1 General. This section has been added to clarify the design and construction of swimming pools, spas, and hot tubs installed in or on the lot of a one- or two-family dwelling. This section has been added to read: X101.1 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.

(2) Section X101.2 Pools in flood hazard areas. This section has been added to require all pools located in flood hazard areas comply with section X101.2.1 or X101.2.2. This section has been added to read: X101.2 Pools in flood hazard areas. Pools that are located in flood hazard areas established by Table R301.2(1), including above-ground pools, on-ground pools, and in-ground pools that involve placement of fill, shall comply with Sections X101.2.1 or X101.2.2. Exception: Pools located in riverine flood hazard areas which are outside of designated floodways.

(3) Section X101.2.1. Pools located in designated floodways. This section has been added to require documentation to demonstrate the pool construction will not increase the design flood elevation at any point in the jurisdiction for all pools located in designated floodways. This section has been added to read: X101.2.1 Pools located in designated floodways. Where pools are located in designated floodways, documentation shall be submitted to the building official, which demonstrates that the construction of the pool will not increase the design flood elevation at any point within the jurisdiction.

(4) Section X101.2.2. Pools located where floodways have not been designated. This section has been added to require the applicant to provide a floodway analysis to demonstrate that the proposed pool will minimally increase the design flood elevation at any point within the jurisdiction, when the pool will be located where design flood elevations are specified by floodways. This section has been modified to read: X101.2.2 Pools located where floodways have not been designated. Where pools are located where design flood elevations are specified but floodways which have not been designated, the applicant shall provide a floodway analysis that demonstrates that the proposed pool will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.

(c) X102 Definitions. This section heading has been added to clarify the section of text that applies to the definitions. This header has been added to read: X102 Definitions.

(1) Section X102.1 General. This section has been added to define specific terms to be utilized in this appendix as set forth in Chapter 2. This section has been modified to read: X102.1 General. For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

(2) ABOVE-GROUND/ON-GROUND POOL. See "Swimming pool."

(3) BARRIER. A fence, wall, building wall or combination thereof which completely surrounds the swimming pool and obstructs access to the swimming pool.

(4) HOT TUB. See "Swimming pool."

(5) IN-GROUND POOL. See "Swimming pool."

(6) RESIDENTIAL. That which is situated on the premises of a detached one- or two-family dwelling or a one-family townhouse not more than three stories in height.

(7) SPA, NONPORTABLE. See "Swimming pool."

(8) SPA, PORTABLE. A nonpermanent structure intended for recreational bathing, in which all controls, water-heating and water-circulating equipment are an integral part of the product.

(9) SWIMMING POOL. Any structure intended for swimming or recreational bathing that contains water over 24 inches (610 mm) deep. This includes in-ground, above-ground, and on-ground swimming pools, hot tubs and spas.

(10) SWIMMING POOL, INDOOR. A swimming pool which is totally contained within a structure and surrounded on all four sides by the walls of the enclosing structure.

(11) SWIMMING POOL, OUTDOOR. Any swimming pool which is not an indoor pool.

(d) X103 Swimming Pools. This section header has been added to clarify the sections of text that apply specifically to in-ground, above-ground and on-ground swimming pools. This heading has been added to read: Section X103 Swimming Pools.

(1) Section X103.1. In-ground pools. This section has been added to list the specifications to which all in-ground pools shall be designed and constructed. This section has been added to read: X103.1 In-ground pools. In-ground pools shall be designed and constructed in conformance with ANSI/NSPI-5 as listed in Section X108.

(2) Section X103.2 Above-ground and on-ground pools. This section has been added to list the specifications to which all above-ground and on-ground pools shall be designed and constructed. This section has been added to read: X103.2 Above-ground and on-ground pools. Above-ground and on-ground pools shall be designed and constructed in conformance with ANSI/NSPI-4 as listed in Section X108.

(3) Section X103.3 Pools in flood hazard areas. This section has been added to specify the specifications to which all pools located in flood hazard areas shall be designed and constructed to. This section has been added to read: X103.3 Pools in flood hazard areas. In flood hazard areas established by Table R301.2(1), pools in coastal high hazard areas shall be designed and constructed in conformance with ASCE 24.

(e) X104 Spas and Hot Tubs. This section header has been added to clarify the section of this appendix that apply specifically to spas and hot tubs. This section heading has been added to read: X104 Spas and Hot Tubs.

(1) Section X104.1 Permanently installed spas and hot tubs. This section has been added to specify the requirements for the design and construction of permanently installed spas and hot tubs. This section has been added to read: X104.1 Permanently installed spas and hot tubs. Permanently installed spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-3 as listed in Section X108.

(2) Section X104.2 Portable spas and hot tubs. This section has been added to specify the requirements for the design and construction of portable spas and hot tubs. This section has been added to read: X104.2 Portable spas and hot tubs. Portable spas and hot tubs shall be designed and constructed in conformance with ANSI/NSPI-6 as listed in Section X108.

(f) X105 Barrier Requirements. This section header has been added to clarify the sections of this appendix that apply specifically to barrier requirements. This section has been added to read: X105 Barrier Requirements.

(1) Section X105.1 Application. This section has been added to list the provisions that shall control the design of barriers for residential swimming pools, spas and hot tubs. This section has been added to read: X105.1 Application. The provisions of this chapter shall control the design of barriers for residential swimming pools, spas and hot tubs. These design controls are intended to provide protection against potential drownings and near drownings by restricting access to swimming pools, spas and hot tubs.

(2) Section X105.2 Outdoor swimming pool. This section has been added to provide the specifications to which all outdoor pools, spas and hot tub barriers shall meet. This section has been added to read: X105.2 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground, or on-ground pool, hot tub or spa shall comply with one of the following:

(A) The top of the barrier shall be at least 48 inches (1219 mm) above grade measured on the side of the barrier which faces away from the swimming pool. The maximum vertical clearance between grade and the bottom of the barrier shall be 2 inches (51 mm) measured on the side of the barrier which faces away from the swimming pool. Where the top of the pool structure is above grade, such as an above-ground pool, the barrier may be at ground level or mounted on top of the pool structure. Where the barrier is mounted on top of the pool structure, the maximum vertical clearance between the top of the pool structure and the bottom of the barrier shall be 4 inches (102 mm).

(B) Openings in the barrier shall not allow passage of a 4-inch-diameter sphere.

(C) Solid barriers which do not have openings, such as a masonry or stone wall, shall not contain indentations or protrusions except for normal construction tolerances and tooled masonry joints.

(D) Where the barrier is composed of horizontal and vertical fence members and the distance between the tops of the horizontal members is less than 45 inches (1143 mm), the horizontal members shall be located on the swimming pool side of the fence. Spacing between vertical fence members shall not exceed 1 3/4 inches (44 mm) in width. Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 3/4 inches (44 mm) in width.

(E) Where the barrier is composed of horizontal and vertical fence members and the distance between the tops of the horizontal members is 45 inches (1143 mm) or more, spacing between the vertical fence members shall not exceed 4 inches (102 mm). Where there are decorative cutouts within vertical members, spacing within the cutouts shall not exceed 1 3/4 inches (44 mm) in width.

(F) Maximum mesh size for chain link fences shall be 2 1/4 inches (57 mm) square unless the fence has slats fastened at the top or bottom which reduce the openings to not more than 1 3/4 inches (44 mm).

(G) Where the barrier is composed of diagonal members, such as lattice fence, the maximum opening formed by the diagonal members shall not be more than 1 3/4 inches (44 mm).

(H) Access gates shall comply with the requirements of Section X105.2 Items A through G, and shall be equipped to accommodate a locking device. Pedestrian access gates shall open outward away from the pool and shall be self-closing and have a self-latching

device. Gates other than pedestrian access 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 gate, the release mechanism and openings shall comply with the following:

- (i) The release mechanism shall be located on the pool side of the gate at least 3 inches (76 mm) below the top of the gate; and
- (ii) The gate and barrier shall have no opening larger than 1/2 inch (12.7 mm) within 18 inches (457 mm) of the release mechanism.

(I) Where a wall of a dwelling serves as part of the barrier, one of the following conditions shall be met:

- (i) The pool shall be equipped with a powered safety cover in compliance with ASTM F 1346; or
- (ii) Doors with direct access to the pool through that wall shall be equipped with an alarm which produces an audible and visual warning when the door and/or its screen, if present, are opened. The alarms shall be listed and labeled in accordance with UL 2017. The deactivation switch(es) shall be located at least 54 inches (1372 mm) above the threshold of the door; or
- (iii) Other means of protection, such as self-closing doors with self-latching devices, which are approved by the governing body, shall be acceptable as long as the degree of protection afforded is not less than the protection afforded by Item G.i or G.ii as described above.

(J) Where an above-ground pool structure is used as a barrier or where the barrier is mounted on top of the pool structure, and the means of access is a ladder or steps;

- (i) The ladder or steps shall be capable of being secured, locked or removed to prevent access; or
- (ii) The ladder or steps shall be surrounded by a barrier which meets the requirements of Section X105.2, Items A through I. When the ladder or steps are secured, locked or removed, any opening created shall not allow the passage of a 4-inch (102 mm) sphere.

(3) Section X105.3 Indoor swimming pool. This section has been added to require a wall surrounding an indoor pool to comply with Section X105.2, Item I. This section has been added to read: X105.3 Indoor swimming pool. Wall surrounding an indoor swimming pool shall comply with Section X105.2, Item I.

(4) Section X105.4 Prohibited locations. This section has been added to clarify that barriers shall be located to prohibit permanent structures, equipment or similar object to be utilized to climb over the pool barrier. This section has been added to read: X105.4 Prohibited locations. Barriers shall be located to prohibit permanent structures, equipment or similar objects from being used to climb over the pool barrier.

(5) Section X105.5 Barrier exceptions. This section has been added to clarify the exception to the barrier requirements. This section has been added to read: X105.5 Barrier exceptions. Spas or hot tubs with a safety cover which complies with ASTM F 1345, as listed in Section X107, shall be exempt from the barrier provisions of this appendix.

(g) X106 Entrapment Protection for Swimming Pool and Spa Suction Outlets. This section heading has been added to clarify the section of text that addresses entrapment protection. This section heading has been added to read: X106 Entrapment Protection for Swimming Pool and Spa Suction Outlets.

(h) Section X106.1 General. This section has been added to clarify how suction outlets shall be designed and installed. This section has been added to read: X106.1 General. Suction outlets shall be designed and installed in accordance with ANSI/APSP-7.

(i) X107 Abbreviations. This section heading has been added to clarify the section of the text that addresses abbreviations in the appendix. The section heading has been added to read: X107 Abbreviations.

(1) ANSI – American National Standards Institute, 11 West 42<sup>nd</sup> Street, New York, NY 10036

(2) APSP – Association of Pool and Spa Professionals

(3) NSPI – National Spa and Pool Institute, 2111 Eisenhower Ave, Alexandria, VA 22314

(4) ASCE – American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 98411-0700

(5) ASTM – ASTM International, 1000 Barr Harbor Drive, West Conshohocken, PA 19428

(6) UL – Underwriters Laboratories, Inc., 333 Pfingsten Rd., Northbrook, IL 60062-2096

(j) X108 Standards. This section header has been added to clarify portions of this appendix that addresses the standards and location of the referenced standards utilized in the appendix. This section heading has been added to read: X108 Standards.

(1) ANSI/NSPI-3-99 Standard for Permanently Installed Residential Spas, Section X104.1

(2) ANSI/NSPI-4-99 Standard for Above-ground/On-ground Residential Swimming Pools, Section X103.2

(3) ANSI/NSPI-5-2003 Standard for Residential In-ground Swimming pools, Section X103.1

(4) ANSI/NSPI-6-99 Standard for Residential Portable Spas, Section X104.2

(5) ANSI/APSP-7-06 Standard for Suction Entrapment avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs and Catch Basins, Section X106.1

(6) ASCE/SEI-24-05 Flood Resistant Design and Construction, Section X103.3

(7) ASTM F-1346-91 (2003) Performance Specification for Safety Covers and Labeling Requirements for All Covers for Swimming Pools, Spas and Hot Tubs Sections X105.2, X105.5

(8) UL 2017-2000 Standard for General-purpose Signaling Devices and Systems – with Revisions through June 2004, Section X105.1

[Source: Added at 33 Ok Reg 1852, eff 11-1-16]

#### **748:20-5-28. Appendix Y, Residential Tornado Provisions**

(a) This appendix has been newly created and entitled "Residential Tornado Provisions." The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance or order.

(b) Y101 Scope. This section heading has been added to specify the sections of this appendix that deal with the Scope of the appendix. This section header has been added to read: Y101. Scope.

(1) Section Y101.1 General. This section has been added to clarify the provisions shall be applicable for new construction. This section has been added to read: Y101.1 General. These provisions shall be applicable for new construction where residential tornado provisions are required. This appendix provides prescriptive based requirements for construction of a residential structure meeting or exceeding a 135 mph wind event corresponding to an EF-2 tornado rating. The single most important objective in protecting a structure against high wind is achieving a continuous load path from the roof to the foundation. Based on the findings of studies and failures associated with various construction types, a group of 11

building practices (each associated with a different aspect of the structure) are summarized in this section.

(2) Section Y101.2 Application. This section has been added to clarify the administrative provisions of this appendix are applicable in the administrative and building planning and construction requirements in Chapters 1 through 10 of this code. The section has been added to read: Y101.2 Application. In addition to the general administration requirements of Chapter 1, the administrative provisions of this appendix shall also apply to the building planning and construction requirements of Chapters 1 through 10.

(3) Section Y101.3 Wind design criteria. This section has been added to clarify that if Section R301.2.1 is modified, the buildings and portions thereof shall be constructed in accordance with the code and the ultimate wind speed design of 135 mph. This section has been added to read: Y101.3 Wind design criteria. Modifying section R301.2.1 buildings and portions thereof shall be constructed in accordance with the wind provisions of this code using the ultimate design wind speed 135 mph.

(4) Section Y101.4 Lumber sheathing. This section has been added to address the permitted forms of lumber sheathing. This section has been added to read: Y101.4 Lumber sheathing. Only OSB or plywood sheathing is permitted. Dimensional lumber sheathing may not be used. Allowable spans and attachment for lumber used as roof or exterior wall sheathing shall conform to the following:

(A) Y101.4.1 Sixteen Inch Framing. For rafter, stud, or beam spacing of 16 inches, the minimum nominal sheathing panel thickness will be 7/16 inch, the minimum wood structural panel span rating 24/16, to be nailed with 8d ring shank (0.131 inch x 2.5 inch) or 10d (0.148 inch x 3 inch) nails on 4 inches on center along the edges and 6 inches on center in the field.

(B) Y101.4.2 Twenty-four Inch Framing. For rafter, stud or beam spacing of 24 inches, the minimum nominal sheathing panel thickness will be 23/32 inch, the minimum wood structural panel span rating 24/16 to be nailed with 8d ring shank (0.131 inch x 2.5 inch) or 10d (0.148 inch x 3 inch) nails on 4 inches on center along the edges and 4 inches on center in the field.

(5) Section Y101.5 Ceiling joist and rafter connections. This section has been added to require ceiling joists and rafters to be nailed to each other in a manner to achieve a connection that can transfer a 500 pound force in both compression and tension across the connections. This section has been added to read: Y101.5 Ceiling joist and rafter connections. In addition to the provisions of Chapter 8, ceiling joists and rafters shall be nailed to each other in a manner to achieve a connection that can transfer a 500 pound force in both compression and tension across the connection.

(6) Section Y101.6 Rafter uplift resistance. This section has been added to require individual rafters to be attached to supporting wall assemblies by connections capable of resisting uplift forces of 500 pounds. This section has been added to read: Y101.6 Rafter uplift resistance. Individual rafters shall be attached to supporting wall assemblies by connections capable of resisting uplift forces of 500 pounds.

(7) Section Y101.7 Gable end walls. This section has been added to clarify connections and sheathing for gable end walls. This section has been added to read: Y101.7 Gable end walls. Gable end walls will be sheathed per Y101.4 and will have connections to both a.) supporting wall assemblies and b.) roof framing by connections capable of resisting uplift forces of 500 pounds in both compression and tension across the connection.

(8) Section Y101.8 Exterior wall bracing. This section has been added to clarify sheathing methods to be utilized to brace exterior walls and prohibit intermittent bracing on exterior walls. This section has been added to read: Y101.8 Exterior wall bracing. Only continuous sheathing methods per R602.10.4.2 may be used to brace exterior walls. Frame garage doors using the sheathed portal frame method CS-PF. Lumber sheathing and attachment per Y101.4. Any form of intermittent bracing is not allowed on an exterior wall. Intermittent bracing may only be used for interior braced wall lines.

(9) Section Y101.9 Multi story construction. This section has been added to require nailing upper and lower story wall sheathing to a common rim board. This section has been added to read: Y101.9 Multi story construction. Nail upper and lower story wall sheathing to common rim board in order to maintain continuity between stories.

(10) Section Y101.10 Wood floor above crawl space construction. This section has been added to require extending structural wood sheathing to lap the sill plate. This section has been added to read: Y101.10 Wood floor above crawl space construction. Extend structural wood sheathing to lap the sill plate. Nail to sill plate at 4 inches on center along the edges. Nail to rim board if present with 8d ring shank (0.131 inch x 2.5 inch) or 10d (0.148 inch x 3 inch) nails at 4 inches on center along both the top and bottom edges of the rim board.

(11) Section Y101.11 Garage Doors. This section has been added to require garage doors to be rated for 135 mile per hour winds. This section has been added to read: Y101.11 Garage Doors. Garage doors are to be wind rated to 135 mph.

[Source: Added at 33 Ok Reg 1852, eff 11-1-16, Amended at 34 Ok Reg 2107, eff 9-15-17]