

ARTICLE I.
RESIDENTIAL CODE

Section 150.001 Adopted.

(a) The *International Residential Code*, ~~2015~~ [2012](#) edition including Appendix E, Appendix G, and Appendix H as published by the International Code Council Inc. as amended, is hereby adopted as the residential building code by the city for regulating the design, construction, quality of materials, erection, installation, alteration, movement, repair, equipment, use and occupancy, location, removal, and demolition of detached one- and two-family dwellings and town houses not more than three stories in height with a separate means of egress and their accessory structures, and provides for the issuance of permits and the collection of fees therefor.

(b) The adoption of the International Residential Code, 2015 edition will become effective May 1, 2016. The minimum building standards in the 2015 edition of the *International Residential Code* and amendments thereto shall be applied to any building permit issued after April 30, 2016.

(c) The city shall publish this ordinance, without attachments, after its passage. The attachments are on file and available for inspection at the office of the city clerk.

Section 150.002 AMENDMENTS, ADDITIONS, AND DELETIONS TO THE 2015 INTERNATIONAL RESIDENTIAL CODE.

The following sections and subsections of the 2015 International Residential Code adopted in this article shall be amended, added, or not adopted by the city as follows. All other sections or subsections of the 2015 International Residential Code as published shall remain the same.

R101.1 Title. These provisions shall be known as the *Residential Code for One- and Two-family Dwellings* of [the city of Sioux Falls](#), and shall be cited as such and will be referred to herein as “this code.”

Commentary: *This simply inserts that these local modifications are applicable to the “City of Sioux Falls.”*

R101.2 Scope. The provisions of the *International Residential Code for One- and Two-family Dwellings* shall apply to the construction, *alteration*, movement, enlargement, replacement, repair, *equipment*, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and *townhouses* not more than three stories above *grade plane* in height with a separate means of egress and their *accessory structures* not more than three stories above grade plane in height.

Exceptions: 1. Live/work units located in townhouses and complying with the requirements of Section 419 of the *International Building Code* shall be permitted to be

constructed in accordance with the *International Residential Code for One- and Two-Family Dwellings*. Fire suppression ~~required by Section 419.5 of the International Building Code where constructed under the International Residential Code for One- and Two-family Dwellings shall~~ if installed may conform to Section P2904.

2. Owner-occupied lodging houses with five or fewer guestrooms shall be permitted to be constructed in accordance with the *International Residential Code for One- and Two-family Dwellings*, ~~where equipped with a~~ A fire sprinkler system if installed may be in accordance with Section P2904.

3. Existing buildings undergoing repair, alteration or additions, and change of occupancy may be permitted to comply with the International Existing Building Code.

Commentary: This section establishes when the provisions of the residential code apply, whether all or in part. The amendments to Exceptions 1 and 2 eliminates any mandatory reference to the installation of an automatic extinguishing system consistent with State law. The amendment to Exception 3 is to clarify that instead of only using the provision of the IRC for repairs, remodels, alterations, changes of use, etc., that the designer or building owner has the ability to use the scoping provisions of the International Existing Building Code as an alternate.

R103.1 ~~Creation of e~~**Enforcement agency.** ~~The department of building safety- Building Services~~ is hereby created and the official in charge thereof shall be known as the *building official*.

Commentary: This inserts the correct title of the office that enforces minimum building standards, Building Services.

R103.2 Appointment. Not adopted by the City.

Commentary: This is eliminated because the building official is not an appointed position.

R104.8.1 Legal defense. Any suit or criminal complaint instituted against an officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be afforded all the protection provided by the city's insurance pool and any immunities and defenses provided by other applicable state and federal law and defended by legal representatives of the *jurisdiction* until the final termination of the proceedings. The *building official* or any subordinate shall not be liable for cost in any action, suit or proceeding that is instituted in pursuance of the provisions of this code.

This code shall not be construed to relieve from or lessen the responsibility of any person owning, operating, or controlling any building or structure for any damages to persons or property caused by defects, nor shall the code enforcement agency or the city be held as assuming any such liability by reason of the inspection authorized by this code or any permits or certificates issued under this code.

Commentary: This amendment inserts that an employee who enforces the code is protected from liability within the limitations of the City's insurance pool or any other applicable state or federal law.

The second paragraph maintains language from the legacy codes as it relates to assuming liability in the enforcement of the minimum building standards of the code.

R105.1 Required. Any owner or owner's authorized agent who intends to construct, enlarge, alter, repair, move, demolish or change the occupancy of a building or structure, or to erect, install, enlarge, alter, repair, remove, convert or replace any electrical, gas, mechanical or plumbing system, the installation of which is regulated by this code, or to cause any such work to be performed, shall first make application to the *building official* and obtain the required *permit*. [The building official may exempt permits for minor work.](#)

[Exclusive of a homeowner, no person or firm shall be issued a building permit for residential building defined as owner-occupied one- and two-family dwellings, including accessory garages, until that person or firm has been issued a residential contractor's license required by this chapter.](#)

Commentary: This gives the authority to exempt permits for work that is considered minor enough to not require inspections. It also references that any work that is contracted for an owner of an occupied one- and two- family dwelling is required to be permitted by a licensed residential contractor.

R105.2 Work exempt from permit. Exemption from *permit* requirements of this code shall not be deemed to grant authorization for any work to be done in any manner in violation of the provisions of this code or any other laws or ordinances of this *jurisdiction*. Permits shall not be required for the following:

- Building:** 1. One-story detached *accessory structures*, provided that the floor area does not exceed 200 square feet (18.58 m²). [A placement permit is required by the zoning division.](#)
2. Fences not over 7 feet (2134 mm) high. [A fence permit is required by the zoning division.](#)
3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the [grade elevation footing](#) to the top of the wall, unless supporting a surcharge.
4. Water tanks supported directly upon *grade* if the capacity does not exceed 5,000 gallons (18,927 L) and the ratio of height to diameter or width does not exceed 2 to 1.
5. Sidewalks and driveways. [A driveway permit is required by the zoning division.](#)
6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.
7. Prefabricated swimming pools that are less than [18 24](#) inches (~~457 610~~ mm) deep.
8. Swings and other playground equipment.
9. Window awnings supported by an exterior wall that do not project more than 54 inches (1,372 mm) from the exterior wall and do not require additional support.

10. Decks not exceeding 200 square feet (18.58 m²) in area, that are not more than 30 inches (762 mm) above *grade* at any point, are not attached to a dwelling and do not serve the exit door required by Section R311.4.

Electrical:

1. *Listed* cord-and-plug connected temporary decorative lighting.
2. Reinstallation of attachment plug receptacles but not the outlets therefor.
3. Replacement of branch circuit overcurrent devices of the required capacity in the same location.
4. Electrical wiring, devices, *appliances*, apparatus or *equipment* operating at less than 25 volts and not capable of supplying more than 50 watts of energy.
5. Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical *equipment* to *approved* permanently installed receptacles.

Gas:

1. Portable heating, cooking or clothes drying *appliances*.
2. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
3. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Mechanical:

1. Portable heating *appliances*.
2. Portable ventilation *appliances*.
3. Portable cooling units.
4. Steam, hot- or chilled-water piping within any heating or cooling *equipment* regulated by this code.
5. Replacement of any minor part that does not alter approval of *equipment* or make such *equipment* unsafe.
6. Portable evaporative coolers.
7. Self-contained refrigeration systems containing 10 pounds (4.54 kg) or less of refrigerant or that are actuated by motors of 1 horsepower (746 W) or less.

8. Portable-fuel-cell *appliances* that are not connected to a fixed piping system and are not interconnected to a power grid.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe; provided, however, that if any concealed trap, drainpipe, water, soil, waste or vent pipe becomes defective and it becomes necessary to remove and replace the same with new material, such work shall be considered as new work and a *permit* shall be obtained and inspection made as provided in this code.

2. The clearing of stoppages or the repairing of leaks in pipes, valves or fixtures, and the removal and reinstallation of water closets, provided such repairs do not involve or require the replacement or rearrangement of valves, pipes or fixtures.

Commentary: This section defines the types of work that do not require a building permit. Even though a building permit is not required for a shed less than 200 square feet, a zoning placement permit is nevertheless required; fences do not require a building permit, but there is a reference that a zoning permit is required; the height of a retaining wall that is exempt from permit issuance is clarified as the amount of grade that it supports, not from the bottom of the footing; the Zoning division requires permits for driveways; based on established ordinances for fence enclosures for pools, the exemption is 18 inches in water depth.

R106.1 Submittal documents. Submittal documents consisting of *construction documents*, and other data shall be submitted ~~in two or more sets~~ with each application for a *permit*. The *construction documents* shall be prepared by a registered *design professional* where required by the statutes of the *jurisdiction* in which the project is to be constructed. Where special conditions exist, the *building official* is authorized to require additional *construction documents* to be prepared by a registered *design professional*.

Exception: The *building official* is authorized to waive the submission of *construction documents* and other data not required to be prepared by a registered *design professional* if it is found that the nature of the work applied for is such that reviewing of *construction documents* is not necessary to obtain compliance with this code.

Commentary: With reference to residential submittals, this is to require only a hard copy set of plans to accommodate the actual code review.

R106.1.5 Energy efficiency. Construction documents for detached one- and two-family dwellings and townhomes shall be provided with the intended R-value for the ceilings, walls, floors, basement walls (if finished), slab perimeter R-value and depth, and crawl space walls.

Commentary: This clarifies that new dwelling plans detail the minimum energy efficiency values for ceilings, walls, floors, basement walls.

R106.1.6 Foundation reinforcement. Construction for detached one- and two-family dwellings and town houses shall be provided with the intended reinforcement of foundation walls

referenced in Tables R404.1.1(2), R404.1.1(3), and R404.1.1(4) for reinforced masonry foundation walls; Tables R404.1.2(2), R404.1.2(3), R404.1.2(4), and R404.1.1(8) for flat concrete foundation walls; Tables 404.1.2(5) and R404.1.2(6) for waffle-grid basement walls; and Table R404.1.2(7) for screed-grid basement walls where the foundation wall exceeds the provisions for plain masonry and concrete foundation walls.

Commentary: This requires that new dwelling plans detail the minimum size and spacing of reinforcement for foundation walls.

R106.2 Site plan or plot plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing the size and location of new construction and existing structures on the site and distances from *lot lines*. Site plans for new dwellings are required to specify the minimum ground elevation (MGE) which designates the elevation of the top of the black dirt under the grass, or the top of the landscape rock or other landscape material at the lowest exposed part of the house. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The *building official* is authorized to waive or modify the requirement for a site plan where the application for *permit* is for *alteration* or repair or where otherwise warranted.

Commentary: The MGE is critical to assure that the structure is set above a level to prevent surface water from entering the home and will be required to be specified on plans for new homes prior to permit issuance.

R106.3.1 Approval of construction documents. Where the *building official* issues a *permit*, the *construction documents* shall be submitted and reviewed ~~approved in writing or by a stamp that states "REVIEWED FOR CODE COMPLIANCE."~~ One set of *construction documents* so reviewed shall be retained by the *building official*. ~~The other set shall be returned to the applicant, shall be kept at the site of work and shall be open to inspection by the *building official* or a duly authorized representative.~~

Commentary: Building Services does not require that a second copy of reviewed plans be returned to the permit holder.

R108.2 Schedule of permit fees. On buildings, structures, electrical, gas, mechanical and plumbing systems or *alterations* requiring a *permit*, a fee for each *permit* shall be paid as required, in accordance with the schedule as established by the city, applicable governing authority.

The fee for each residential building permit shall be set forth in Table 1-A, and other inspections and fees shall be in accordance with Table 1-C.

Table No. 1-A.
Residential Building Permit Fees Group R Division 3
(Including Congregate Residences Defined as R-3 and Accessory Group U Occupancies)

<u>Total Valuation</u>	<u>Fee</u>
<u>\$1 to \$1,100</u>	<u>\$20</u>
<u>\$1,101 to \$2,000</u>	<u>For valuations in excess of \$1,100, \$10 for the first \$500, plus \$1.50 for each additional \$100 or fraction thereof, to and including \$2,000</u>
<u>\$2,001 to \$25,000</u>	<u>\$32.50 for the first \$2,000, plus \$6 for each additional \$1,000 or fraction thereof, to and including \$25,000</u>
<u>\$25,001 to \$50,000</u>	<u>\$170.50 for the first \$25,000, plus \$4.50 for each additional \$1,000 or fraction thereof, to and including \$50,000</u>
<u>\$50,001 to \$100,000</u>	<u>\$283 for the first \$50,000, plus \$3 for each additional \$1,000 or fraction thereof, to and including \$100,000</u>
<u>\$100,001 and up</u>	<u>\$433 for the first \$100,000, plus \$2.50 for each additional \$1,000 or fraction thereof</u>

Table 1-C. Other Inspections and Fees

<u>1. Inspection outside of normal business hours, per hour* (minimum charge—one hour).....</u>	<u>\$70.00</u>
<u>2. Reinspection fees, per hour.....</u>	<u>\$70.00</u>
<u>3. Inspections for which no fee is specifically indicated, per hour* (minimum charge—one-half hour).....</u>	<u>\$70.00</u>
<u>4. Additional plan review required by changes, additions, or revisions to approved plans, per hour* (minimum charge—one-half hour).....</u>	<u>\$70.00</u>
<u>*Or the total hourly cost to the jurisdiction, whichever is the greatest. This cost shall include supervision, overhead, equipment, hourly wages, and fringe benefits of the employees involved.</u>	
<u>5. Wrecking permit fees.....</u>	<u>\$20.00</u>
<u>6. Swimming pool fence enclosures.....</u>	<u>\$20.00</u>
<u>7. Residential reshingles.....</u>	<u>\$20.00</u>
<u>8. Residential resides.....</u>	<u>\$20.00</u>
<u>9. Residential window replacements with no structural modifications (Group R and U occupancies).....</u>	<u>\$20.00</u>

10. Board of appeals fees: Before any action is taken by the board, the party or parties requesting such hearing shall deposit with the secretary of the board, or his authorized agent, the sum of \$65.00 to cover the approximate cost of the procedure. Under no condition shall said sum or any part thereof be refunded for failure of said request to be approved.
11. A mileage fee at the current rate per mile as established by the finance department shall be charged for any inspection occurring outside city limits.
12. Residential contractor's license examination fee.....\$75.00
13. Bond claims. An administrative fee shall be charged to cover the administrative cost of filing a claim.....\$150.00

Commentary: This inserts those fees to cover the costs of the work expended by Building Services staff which includes plan review, inspections, administering permit issuance and department overhead. No fee increases are included for this code cycle.

R108.6 Work commencing before permit issuance. Any person who commences work requiring a *permit* on a building, structure, electrical, gas, mechanical or plumbing system before obtaining the necessary permits shall be subject to a fee established by the applicable governing authority that shall be in addition to the required *permit* fees. Administrative citations and legal and/or civil proceedings may also be commenced.

Commentary: This clarifies that work that is commenced without the issuance of a building permit can result in the issuance of administrative citations through the code enforcement process and which could include subsequent legal proceedings.

R108.7 Delinquent accounts. The administrative authority may refuse to issue permits or conduct inspections for any person or business whose account is delinquent.

Commentary: This clarifies that permits and inspections can be refused for a contractor whose accounts are delinquent with the City.

R109.1.1 Footing Foundation inspection. Inspection of the footing foundation shall be made after poles or piers are set or trenches or *basement* areas are excavated and any required forms erected and any required reinforcing steel is in place and supported prior to the placing of concrete. The footing foundation inspection shall include excavations for thickened slabs intended for the support of bearing walls, partitions, structural supports, or *equipment* and special requirements for wood foundations.

Commentary: The reference to foundation inspections is eliminated because inspections occur for the footings but do not occur prior to the pouring of foundation walls.

R109.1.3 Floodplain inspections. For construction in flood hazard areas as established by Chapter 156, Floodplain Management Table R301.2(1), upon placement of the lowest floor, including *basement*, and prior to further vertical construction, the floodplain administrator building official shall require submission of documentation, prepared and sealed by a registered

design professional, of the elevation of the lowest floor, including *basement*, required in [Chapter 156, Floodplain Management](#) ~~Section R322~~.

Commentary: *This is to clarify that floodplain provisions are found in the Floodplain Management Ordinance and not in the Residential Code.*

R109.1.6.1 Elevation documentation. If located in a flood hazard area, the documentation of elevations required in Section R322.1.10 shall be submitted to the [floodplain administrator](#) ~~building official~~ prior to the final inspection.

Commentary: *This is to clarify that elevation certificates are submitted to the Floodplain Administrator, not the Building Official.*

R110.1 Use and occupancy. A building or structure shall not be used or occupied, and a change in the existing use or occupancy classification of a building or structure or portion thereof shall not be made, until the *building official* has issued a certificate of occupancy therefor as provided herein [and final inspections have been obtained from the electrical, mechanical, plumbing, and building inspection divisions of building services. An inspection placard shall be posted on the electrical panel, which is signed after final inspections have occurred by the electrical inspector, mechanical inspector, and plumbing inspector for new one- and two-family dwelling units and multiple single-family dwellings \(town houses\).](#) Issuance of a certificate of occupancy shall not be construed as an approval of a violation of the provisions of this code or of other ordinances of the [city jurisdiction](#). Certificates presuming to give authority to violate or cancel the provisions of this code or other ordinances of the [city jurisdiction](#) shall not be valid.

Exceptions: 1. Certificates of occupancy are not required for work exempt from permits under Section R105.2.

2. Accessory buildings or structures.

R110.6 Placards. [Placards or inspection record tags placed on the job by the inspectors to indicate approval of the work inspected shall not be removed, except when authorized by the building official.](#)

Commentary: *These provisions clarify that occupancy in new dwellings is allowed to occur after final inspections from each respective division of Building Services. This directs the posting of a placard that is signed by each assigned inspector from each division of Building Services; i.e.; building, plumbing, mechanical, and electrical. The signatures designate that life safety provisions have been confirmed from each respective division of Building Services.*

R112.1 General. In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, [to review all proposed changes to the respective codes and to submit recommendations to the responsible official and the city council, to review requests for house moves, to examine applicants for licensing, and to investigate matters brought before the board,](#) there shall be and is hereby created a [building](#) board of appeals [and examiners](#). The *building official* shall be an ex officio member of said board but shall not have a vote on any matter before the board. ~~The board of~~ [appeals Members](#) shall be appointed by the [mayor with the consent of the council](#) and shall hold

~~office for a term of three years governing body and shall hold office at its pleasure.~~ The board shall adopt rules of procedure for conducting its business, and shall render decisions and findings in writing to the appellant with a duplicate copy to the *building official* and/or the fire marshal.

The board, in exercising its authority over house moving, may deny the building request or may require additional stipulations to be placed on the building permit to address the protection of the property values and neighborhood compatibility.

Commentary: Whereas the primary purpose of the Building Board of Appeals is to review interpretations of the Building and Fire Officials, these modifications include the additional responsibilities of the Board which relates to review of ordinances, review residential house moves, and review of residential licensure. This also clarifies that the members are appointed by the Mayor with the advice and consent of the Council and that any findings are referred to the appellant in writing.

R112.2 Limitations on authority. An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply or an equally good or better form of construction is proposed. The board shall not have authority relative to the interpretation of the administrative provisions of this code nor shall the board be empowered to waive requirements of this code.

Commentary: This language was in the legacy codes but not included in the International Codes. The purpose of the Board is to review technical determinations by the Building and Fire Code Officials, and not administrative provisions which defines the authority, establishes inspections, determines fees, etc.

R113.3 Prosecution of violation. If the notice of violation is not complied with in the time prescribed by such notice, the *building official* is authorized to request the legal counsel of the *jurisdiction* to deem the violation as a strict liability offense and institute the appropriate proceeding at law or in equity to restrain, correct or abate such violation, or to require the removal or termination of the unlawful occupancy of the building or structure in violation of the provisions of this code or of the order or direction made pursuant thereto.

Section R202. Definitions. Add the following definition.

Strict liability offense. An offense in which the prosecution in a legal proceeding is not required to prove criminal intent as a part of its case. It is enough to prove that the defendant either did an act which was prohibited or failed to do an act which the defendant was legally required to do.

Commentary: Strict liability offense is inserted to clarify that it is applicable to any violation of a residential building code provision. This term brings the code in line with the current legal terminology used in other codes with regard to the prosecution of violations. With this term the prosecutor is not required to prove that code violations were intended by a defendant or were even due to negligence. It is difficult to prove such intentions or negligence in a court of law. This provision is located only in the Property Maintenance Code at the national level but is inserted into all of the adopted Building Services codes locally.

Table R301.2(1)
Climatic and Geographic Design Criteria

GROUND SNOW LOAD ⁿ	<u>40 psf contour</u>
WIND DESIGN	
Wind Speed ^d	<u>115 mph</u>
Topographic Effects ^k	<u>No</u>
SEISMIC DESIGN CATEGORY ^f	<u>A</u>
SUBJECT TO DAMAGE FROM	
Weathering ^a	<u>Severe</u>
Frost Line Depth ^b	<u>42 inches (1,067 mm)</u>
Termite Damage ^c	<u>Slight to Moderate</u>
WINTER DESIGN TEMPERATURE ^e	<u>-11 degrees Fahrenheit</u>
ICE BARRIER UNDERLAYMENT REQUIREMENT ^h	<u>Yes</u>
FLOOD HAZARDS ^g <u>Sioux Falls entered the regular phase of the National Flood Insurance Program on September 17, 1979.</u>	
AIR FREEZING INDEX ⁱ	<u>3,000</u>
MEAN ANNUAL TEMPERATURE ^j	<u>46 degrees Fahrenheit</u>

For SI: 1 pound per square foot = 0.0479 kPa, 1 mile per hour = 0.447 m/s.

a. Weathering may require a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code. The weathering column shall be filled in with the weathering index "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(3). The grade of masonry units shall be determined from ASTM C 34, C 55, C 62, C 73, C 90, C 129, C 145, C 216 or C 652.

b. The frost line depth may require deeper footings than indicated in Figure R403.1(1). The jurisdiction shall fill in the frost line depth column with the minimum depth of footing below finish grade.

c. The jurisdiction shall fill in this part of the table to indicate the need for protection depending on whether there has been a history of local subterranean termite damage.

d. The jurisdiction shall fill in this part of the table with the wind speed from the basic wind speed map [Figure R301.2(4)A]. Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

e. The outdoor design dry-bulb temperature shall be selected from the columns of 97 ½ percent values for winter from Appendix D of the *International Plumbing Code*. Deviations from the Appendix D temperatures shall be permitted to reflect local climates or local weather experience as determined by the building official.

f. The jurisdiction shall fill in this part of the table with the seismic design category determined from Section R301.2.2.1.

g. The jurisdiction shall fill in this part of the table with (a) the date of the jurisdiction's entry into the National Flood Insurance Program (date of adoption of the first code or ordinance for management of flood hazard areas), (b) the date(s) of the Flood Insurance Study and (c) the panel numbers and dates of the currently effective FIRMs and FBFMs or other flood hazard map adopted by the authority having jurisdiction, as amended.

h. In accordance with Sections R905.1.2, R905.4.3.1, R905.5.3.1, R905.6.3.1, R905.7.3.1 and R905.8.3.1, where there has been a history of local damage from the effects of ice damming, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall fill in this part of the table with "NO."

i. The jurisdiction shall fill in this part of the table with the 100-year return period air freezing index (BF-days) from Figure R403.3(2) or from the 100-year (99 percent) value on the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32° F)."

j. The jurisdiction shall fill in this part of the table with the mean annual temperature from the National Climatic Data Center data table "Air Freezing Index-USA Method (Base 32° F)."

k. In accordance with Section R301.2.1.5, where there is local historical data documenting structural damage to buildings due to topographic wind speed-up effects, the jurisdiction shall fill in this part of the table with "YES." Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

l. In accordance with Figure 301.2(4)A, where there is local historical data documenting unusual wind conditions, the jurisdiction shall fill in this part of the table with "YES" and identify the specific requirements. Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

m. In accordance with Section R301.2.1.2.1, the jurisdiction shall indicate the wind-blown debris zone(s). Otherwise the jurisdiction shall indicate "NO" in this part of the table.

n. On roof systems that are not engineered, conventionally framed roof slopes with a rise of 3 inches (76.2 mm) or less to 12 inches (305 mm) shall be designed for a full or unbalanced snow load of not less than 30 pounds per square foot (1.44 kN/square meter) of horizontal projection. Where a roof system is designed to slope less than 1/4 inch (6.35 mm) per 12 inches (305 mm), a surcharge load of not less than 5 pounds per square foot (0.24 kN/square meter) in addition to the required live load due to snow shall be designed for. Roof slopes with over 3 inches (76.2 mm) of rise per 12 inches (305 mm) shall be designed for a full or unbalanced snow load of not less than 25 pounds per square foot (1.2 kN/square meter) of horizontal projection. Potential unbalanced accumulation of snow at valleys, parapets, roof structures, and offsets in roofs of uneven configuration shall be considered.

Commentary: Table R301.2(1) defines the minimum geographic design criteria for residential building construction. The footnotes give directions for a local jurisdiction to reference for such loading requirements such as minimum live loads due to snow, wind speed for lateral force capability, seismic zone location, etc. Footnote n carries over a local legacy amendment that defines a specific snow load which approximates the ground snow criteria and is used for span tables for rafters, which are made available to residential contractors locally.

Table R301.5
Minimum Uniformly Distributed Live Loads
(in pounds per square foot)

USE	LIVE LOAD
Uninhabitable attics without storage ^b	10
Uninhabitable attics with limited storage ^{b, g}	20
Habitable attics and attics served with fixed stairs	30
Balconies (exterior) and decks ^e	40
Fire escapes	40
Guardrails and handrails ^d	200 ^h
Guardrails in-fill components ^f	50 ^h
Passenger vehicle garages ^a	50 ^a
Rooms other than sleeping rooms	40
Sleeping rooms	30
Stairs	40 ^c

For SI: 1 pound per square foot = 0.0479 kPa, 1 square inch = 645 mm², 1 pound = 4.45 N.

a. Elevated garage floors shall be capable of supporting a 2,000-pound load applied over a 20-square-inch area.

b. Uninhabitable *attics* without storage are those where the clear height between joists and rafters is not more than 42 inches, or where there are not two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. This live load need not be assumed to act concurrently with any other live load requirements.

c. Individual stair treads shall be designed for the uniformly distributed live load or a 300-pound concentrated load acting over an area of 4 square inches, whichever produces the greater stresses.

d. A single concentrated load applied in any direction at any point along the top.

e. See Section R507.1 for decks attached to *exterior walls*.

f. *Guard* in-fill components (all those except the handrail), balusters and panel fillers shall be designed to withstand a horizontally applied normal load of 50 pounds on an area equal to 1 square foot. This load need not be assumed to act concurrently with any other live load requirement.

g. Uninhabitable *attics* with limited storage are those where the clear height between joists and rafters is not greater than 42 inches, or where there are two or more adjacent trusses with web configurations capable of accommodating an assumed rectangle 42 inches in height by 24 inches in width, or greater, within the plane of the trusses. The live load need only be applied to those portions of the joists or truss

bottom chords where all of the following conditions are met:

1. The *attic* area is accessible from an opening not less than 20 inches in width by 30 inches in length that is located where the clear height in the *attic* is not less than 30 inches.
2. The slopes of the joists or truss bottom chords are not greater than 2 inches vertical to 12 inches horizontal.
3. Required insulation depth is less than the joist or truss bottom chord member depth.

The remaining portions of the joists or truss bottom chords shall be designed for a uniformly distributed concurrent live load of not less than 10 pounds per square foot.

h. Glazing used in handrail assemblies and *guards* shall be designed with a safety factor of 4. The safety factor shall be applied to each of the concentrated loads applied to the top of the rail, and to the load on the infill components. These loads shall be determined independent of one another, and loads are assumed not to occur with any other live load.

Commentary: This table defines the minimum loads based on the use of a particular area or portion of the structure that must be considered for the design of the corresponding structural element for a residence. The table is consistent with ASCE 7 and the IBC. The local amendment maintains the same live load in a bedroom as any other portion of the house consistent with the previous legacy codes.

**TABLE R302.1(1)
EXTERIOR WALLS**

Exterior Wall Element		Minimum Fire-Resistance Rating	Minimum Fire Separation Distance
Walls	Fire-resistance rated	1 hour—tested in accordance with ASTM E 119 or UL 263 with exposure from both sides	< 5 feet
	Not fire-resistance rated	0 hours	≥ 5 feet
Projections	Fire-resistance rated	1 hour on the underside	≥ 2 to < 3 5-feet
	Not fire-resistance rated	0 hours	≥ 3 5 -feet
Openings	Not allowed	N/A	< 3 feet
	25% Maximum of Wall Area	0 hours	3 feet
	Unlimited	0 hours	5 feet
Penetrations	All	Comply with Section R317.3	< 5 feet
		None required	5 feet

For SI: 1 foot = 304.8 mm.
N/A = Not Applicable.

a. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave if fireblocking is provided from the wall top plate to the underside of the roof sheathing.

b. Roof eave fire-resistance rating shall be permitted to be reduced to 0 hours on the underside of the eave provided that gable vent openings are not installed.

Commentary: This relaxes the mandate to install gypsum sheathing on the underside of a projecting element such as a roof overhang that is closer than 5 feet to a property line. The amendment would require a fire resistive membrane where a projecting element is closer than 3 feet to a property line consistent with previous legacy codes and previous editions of the I-Codes.

R302.2 Townhouses. Common walls separating *townhouses* shall be assigned a fire-resistance rating in accordance with Section R302.2, Item 1 or 2. The common wall shared by two *townhouses* shall be constructed without ~~plumbing or~~ mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be in accordance with ~~Chapters 34 through 43~~ [the National Electrical Code](#). Penetrations of the membrane of common walls for electrical outlet boxes shall be in accordance with Section R302.4. [Plumbing installations shall be in accordance with the Uniform Plumbing Code. Membrane or through penetrations of common walls for plumbing systems shall be in accordance with Section 302.4.](#)

1. Where a fire sprinkler system in accordance with Section P2904 is provided, the common wall shall be not less than a 1-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263.

2. Where a fire sprinkler system in accordance with Section P2904 is not provided, the common wall shall be not less than a 2-hour fire-resistance-rated wall assembly [or equivalent](#) tested in accordance with ASTM E 119 or UL 263.

[Commentary: This reduces the required fire resistivity of a common wall between townhouse units from two hours to one hour, but is based upon the national model code that mandates sprinklers for all townhouses. The local amendment recognizes that a reduced fire resistivity is acceptable if there is a sprinkler system installed, which is not a local code mandate but an option of the owner. The 2015 provision eliminated the penetration of the common wall by plumbing and mechanical systems. Because mechanical systems rarely penetrate common walls, said requirement will remain. Although the section has been modified locally to specify that any membrane or through penetrations are required to be fire stopped to maintain the integrity of the common wall.](#)

R302.2.1 Continuity. The fire-resistance-rated wall or assembly separating *townhouses* shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached enclosed *accessory structures*.

[Exterior walls that extend beyond an adjacent structure that has a fire separation distance less than 5 feet \(1,523 mm\) to a common property line shall have not less than a one-hour fire rating with exposure from both sides with no openings allowed therein.](#)

[Projections such as a deck that have a fire separation distance of less than 3 feet \(914 mm\) to a common property line shall have a 1-hour fire rating with exposure from both sides with no openings allowed therein that extends at least 30 inches \(762 mm\) above the projection.](#)

Commentary: This is intended to clarify that when one side of a town house extends past a common wall between units, the extended wall and/or projecting element is required to be of a fire-resistive construction consistent with location on property provisions.

R302.2.4 Structural independence. Each individual *townhouse* shall be structurally independent.

- Exceptions:**
1. Foundations supporting *exterior walls* or common walls.
 2. Structural roof and wall sheathing from each unit fastened to the common wall framing.
 3. Nonstructural wall and roof coverings.
 4. Flashing at termination of roof covering over common wall.
 5. *Townhouses* separated by a common wall as provided in Section R302.2, Item 1 ~~or~~ 2.

Commentary: The 2015 IRC eliminates the requirement for structural independence, but also eliminates any membrane or through penetrations of the fire wall separation. In a townhouse not provided with a sprinkler system, the penetrations with a fire stop system will continue to be allowed as will the requirement for structural independence. If a townhouse is provided with a sprinkler system, the requirement for the elimination of the structural independence is allowed.

R302.13 Fire protection of floors. Not adopted by the City.

Commentary: The national provision requiring all floor assemblies consisting of light frame construction to be protected on the underside continues to be eliminated locally. This would have required a homeowner who chooses to finish a basement at a later date to remove the covering to accommodate mechanical, electrical, and plumbing systems.

R303.5.1 Intake openings. Mechanical and gravity outdoor air intake openings shall be located not less than 10 feet (3048 mm) from any hazardous or noxious contaminant, such as vents, chimneys, plumbing vents, streets, alleys, parking lots and loading docks.

For the purpose of this section, the exhaust from *dwelling* unit toilet rooms, bathrooms and kitchens shall not be considered as hazardous or noxious.

- Exceptions:**
1. The 10-foot (3048 mm) separation is not required where the intake opening is located 3 feet (914 mm) or greater below the contaminant source.
 2. Vents and chimneys serving fuel-burning appliances shall be terminated in accordance with the applicable provisions of Chapters 18 and 24.
 3. Clothes dryer exhaust ducts shall be terminated in accordance with Section M1502.3.

4. For equipment replacements on existing structures, gravity outdoor intake openings for combustion air shall be located a minimum of 3 feet (914 mm) from any hazardous or noxious contaminant.

Commentary: The 10-foot distance is reduced to 3 feet in existing conditions because of the impracticality of existing space limitations.

R309.5 Fire sprinklers. ~~Not adopted by the City. Private garages shall be protected by fire sprinklers where the garage wall has been designed based on Table R302.1(2), Footnote a. Sprinklers in garages shall be connected to an automatic sprinkler system that complies with Section P2904. Garage sprinklers shall be residential sprinklers or quick-response sprinklers, designed to provide a density of 0.05 gpm/ft². Garage doors shall not be considered obstructions with respect to sprinkler placement.~~

Commentary: This adds provisions to permit non-fire-rated exterior walls and projections for garages with zero clearance to a lot line subject to mandating that the garage be provided with an automatic fire-extinguishing system. The provision is eliminated locally based on state law that does not allow a county or a municipality to require an automatic fire-extinguishing system in one- and two-family dwelling, townhouse, and their accessory structures.

R310.2.1 Minimum opening area. Emergency and escape rescue openings shall have a net clear opening of not less than 5.0 5.7 square feet (0.465 0.530 m²). The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside. The net clear height opening shall be not less than 24 inches (610 mm) and the net clear width shall be not less than 20 inches (508 mm).

~~**Exception:** Grade floor or below grade openings shall have a net clear opening of not less than 5 square feet (0.465 m²).~~

R310.2.2 Window sill height. Where a window is provided as the emergency escape and rescue opening, it shall have a sill height of not more than 48 44 inches (1,219 1118 mm) above the floor; where the sill height is below grade, it shall be provided with a window well in accordance with Section R310.2.3.

R310.2.3.1 Ladder and steps. Window wells with a vertical depth greater than 48 44 inches (1,219 1118 mm) shall be equipped with a permanently affixed ladder or steps usable with the window in the fully open position. Ladders or steps required by this section shall not be required to comply with Sections R311.7 and R311.8. Ladders or rungs shall have an inside width of not less than 12 inches (305 mm), shall project not less than 3 inches (76 mm) from the wall and shall be spaced not more than 18 inches (457 mm) on center vertically for the full height of the window well.

Commentary: These provisions maintain local modifications to allow sill heights of windows and the height of a window well where a ladder is required to be increased from 44 inches to 48 inches. Also, instead of having two standards for the openable area of an egress window, a 5-square-foot clear openable area is deemed acceptable locally.

R311.3.1 Floor elevations at the required egress doors. Landings or finished floors at the required egress door shall be not more than 1 1/2 inches (38 mm) lower than the top of the threshold.

Exception: The landing or floor on the exterior side shall be not more than 8 73/4 inches (202 196 mm) below the top of the threshold provided the door does not swing over the landing or floor.

Where exterior landings or floors serving the required egress door are not at *grade*, they shall be provided with access to *grade* by means of a ramp in accordance with Section R311.8 or a stairway in accordance with Section R311.7.

R311.3.2 Floor elevations for other exterior doors. Doors other than the required egress door shall be provided with landings or floors not more than 8 73/4 inches (202 196 mm) below the top of the threshold.

Exception: A top landing is not required where a stairway of not more than two risers is located on the exterior side of the door, provided that the door does not swing over the stairway.

R311.7.5.1 Risers. The riser height shall be not more than 8 73/4 inches (202 196 mm). The riser shall be measured vertically between leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Risers shall be vertical or sloped from the underside of the nosing of the tread above at an angle not more than 30 degrees (0.51 rad) from the vertical. Open risers are permitted, provided that the openings located more than 30 inches (762 mm), as measured vertically, to the floor or grade below do not permit the passage of a 4-inch diameter (102 mm) sphere.

Exceptions: 1. The opening between adjacent treads is not limited on spiral stairways.

2. The riser height of spiral stairways shall be in accordance with Section R311.7.10.1.

Commentary: These provisions maintain the maximum 8-inch riser for a step at a landing or stair. This riser height was changed to a maximum height of 7 3/4 inches with the first edition of the I-Codes, but has been reverted to an 8-inch which had been the standard for riser heights for years from the previous legacy codes.

R311.7.8.2 Continuity. Handrails for stairways shall extend be continuous for the full length of the flight, from a point directly above the top riser of the flight to a point directly above the lowest riser of the flight. Handrail ends shall be returned or shall terminate in newel posts or safety terminals. Handrails adjacent to a wall shall have a space of not less than 1 1/2 inches (38 mm) between the wall and the handrails.

Exceptions: 1. Handrails shall be permitted to be interrupted by a newel post at the turn.

2. The use of a volute, turnout, starting easing or starting newel shall be allowed over the lowest tread.

R311.7.8.3 Grip-size. Required handrails shall be of one of the following types or provide equivalent graspability.

1. Type I. Handrails with a circular cross section shall have an outside diameter of not less than 1 1/4 inches (32 mm) and not greater than 2 inches (51 mm). If the handrail is not circular, it shall have a perimeter dimension of not less than 4 inches (102 mm) and not greater than 6 1/4 inches (160 mm) with a cross section of dimension of not more than 2 1/4 inches (57 mm). Edges shall have a radius of not less than 0.01 inch (0.25 mm).

2. Type II. Handrails with a perimeter greater than 6 1/4 inches (160 mm) shall have a graspable finger recess area on both sides of the profile. The finger recess shall begin within a distance of 3/4 inch (19 mm) measured vertically from the tallest portion of the profile and achieve a depth of not less than 5/16 inch (8 mm) within 7/8 inch (22 mm) below the widest portion of the profile. This required depth shall continue for not less than 3/8 inch (10 mm) to a level that is not less than 1 3/4 inches (45 mm) below the tallest portion of the profile. The width of the handrail above the recess shall be not less than 1 1/4 inches (32 mm) and not more than 2 3/4 inches (70 mm). Edges shall have a radius of not less than 0.01 inch (0.25 mm).

Exception: Exterior stairs are allowed to have a horizontal 2X member to form a 1 1/2-inch graspable dimension in lieu of the above-referenced perimeter dimensions.

Commentary: This maintains the requirement for a handrail on one side of a stair, but does not require a continuous handrail to provide flexibility for an offset handrail that may terminate at a floor/wall intersection. The exception recognizes that a flat or horizontal 2X member on an exterior deck provides an adequate gripping surface.

R312.1.3 Opening limitations. Required *guards* shall not have openings from the walking surface to the required *guard* height that allow passage of a sphere 5 4 inches (127 102 mm) in diameter.

Exception: The triangular openings at the open side of stair, formed by the riser, tread and bottom rail of a *guard*, shall not allow passage of a sphere 6 inches (153 mm) in diameter.

~~2. Guards on the open side of stairs shall not have openings that allow passage of a sphere 4 3/8 inches (111 mm) in diameter.~~

Commentary: This maintains a 5-inch spacing between intermediates on an open handrail or guardrail instead of the more restrictive 4-inch spacing that dates back to legacy code criteria.

R313.1 Townhouse automatic fire sprinkler systems. Not adopted by the city. An automatic residential fire sprinkler system shall be installed in townhouses.

~~**Exception:** An automatic residential fire sprinkler system shall not be required where *additions or alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~

R313.1.1 Design and installation. ~~When A~~automatic residential fire sprinkler systems for *townhouses* are installed, it shall be designed and installed in accordance with Section P2904 or NFPA 13D.

R313.2 One- and two-family dwellings automatic fire systems. ~~Not adopted by the city. 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.~~

R313.2.1 Design and installation. ~~When A~~automatic residential fire sprinkler systems are installed, it shall be designed and installed in accordance with Section P2904 or NFPA 13D.

Commentary: These provisions have been deleted because South Dakota state law does not allow a county or municipality to mandate automatic fire extinguishers in townhouses or one- and two-family dwellings and their accessory structures. The provisions that define the standard for residential automatic fire-extinguishing systems, a minimum NFPA-13 D or equivalent, is specified for a building owner that chooses to install a residential sprinkler system.

R314.2.2 Alterations, repairs and additions. Where *alterations, repairs or additions* requiring a permit occur with a valuation of more than \$1000, or where one or more sleeping rooms are added or created in existing *dwellings*, the individual *dwelling unit* shall be equipped with smoke alarms located as required for new *dwellings*.

Exceptions: 1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, the *addition* or replacement of windows or doors, or the addition of a porch or deck, are exempt from the requirements of this section.

2. Installation, alteration or repairs of plumbing or mechanical systems are exempt from the requirements of this section.

Commentary: This maintains a legacy code requirement of a \$1000 threshold to not require the installation of smoke detectors for small interior projects.

R314.3 Location. Smoke alarms shall be installed in the following locations:

1. In each sleeping room.
2. Outside each separate sleeping area in the immediate vicinity of the bedrooms.

3. On each additional story of the dwelling, including basements and habitable attics and not including crawl spaces and uninhabitable attics. In dwellings or dwelling units with split levels and without an intervening door between the adjacent levels, a smoke alarm installed on the upper level shall suffice for the adjacent lower level provided that the lower level is less than one full story below the upper level.

4. Smoke alarms shall be installed not less than 3 feet (914 mm) horizontally from the door or opening of a bathroom that contains a bathtub or shower unless this would prevent placement of a smoke alarm required by Section R314.3.

5. Where the ceiling height of a room is open to the hallway serving a bedroom exceeds that of the hallway by 24 inches (610 mm) or more, smoke detectors shall be installed in the hallway and in the adjacent room.

Exception. Hallways less than 4 feet (1,220 mm) in length are allowed to omit the smoke detector within the hallway adjacent to the bedrooms.

Commentary: Item 4 was added nationally to clarify that smoke detectors need to be located at least 3 feet from a bathroom door to eliminate false alarms. This maintains a legacy code requirement to provide the protection of an earlier smoke detector activation on a cathedral or vaulted ceiling located adjacent to bedrooms or a hallway serving bedrooms.

R315.2.2 Alterations, repairs, and additions. Where *alterations*, repairs or *additions* requiring a permit occur with a valuation of more than \$1000, or where one or more sleeping rooms are added or created in existing *dwellings*, the individual *dwelling unit* shall be equipped with carbon monoxide alarms located as required for new *dwellings*.

Exceptions: 1. Work involving the exterior surfaces of *dwellings*, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck, is exempt from the requirements of this section.

2. Installation, alteration or repairs of plumbing or mechanical systems are exempt from the requirements of this section.

Commentary: Previous IRC editions required carbon monoxide detectors for any work requiring a permit including work on the outside where no inspection occurred on the inside to verify the placement of the detectors which was previously not adopted by local amendment. The 2015 IRC now requires carbon monoxide detectors consistent when smoke detectors are required. This maintains a \$1,000 threshold to not require the installation of smoke detectors for small interior projects.

R326.1 General. The design and construction of barriers for pools and spas shall comply with the *International Swimming Pool and Spa Code* following.

R326.2 Definitions. For the purposes of these requirements, the terms used shall be defined as follows and as set forth in Chapter 2.

ABOVE-GROUND/ON-GROUND POOL. See “Swimming pool.”

BARRIER. A fence, wall, building wall or combination thereof that completely surrounds the swimming pool and obstructs access to the swimming pool.

HOT TUB. See “Swimming pool.”

IN-GROUND POOL. See “Swimming pool.”

RESIDENTIAL. That which is situated on the premises of a detached one- or two-family dwelling or a one-family *town house* not more than three stories in height.

SPA, NONPORTABLE. See “Swimming pool.”

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.

SWIMMING POOL. Any structure intended for swimming or recreational bathing that contains water more than 18 inches (457 mm) deep. This includes in-ground, aboveground, and on-ground swimming pools, hot tubs, and spas.

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

SWIMMING POOL, OUTDOOR. Any swimming pool that is not an indoor pool.

R326.3 Application. The provisions of this appendix 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.

This requirement shall be applicable to all new swimming pools hereafter constructed, other than indoor pools, and shall apply to all existing pools, which have a depth of 18 inches (457 mm) or more of water. No person in possession of land within the city, either as owner, purchaser, lessee, tenant, or a licensee, upon which is situated a swimming pool having a depth of 18 inches (457 mm) or more shall fail to provide and maintain such barrier as herein provided.

R326.4 Outdoor swimming pool. An outdoor swimming pool, including an in-ground, above-ground, or on-ground pool, hot tub or spa, shall be surrounded by a barrier that shall be installed, inspected, and approved prior to filling with water that completely surrounds and obstructs access to the swimming pool, which shall comply with the following:

1. The top of the barrier shall be at least 42 inches (1067mm) above *grade* measured on the side of the barrier that 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 that 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, such as the pool structure, 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).

2. Openings in the barrier shall not allow the passage of a 4-inch-diameter (102 mm) sphere.
3. Where an aboveground 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, then:
 - 3.1. The ladder or steps shall be capable of being secured, locked, or removed to prevent access; or
 - 3.2. The ladder or steps shall be surrounded by a barrier, which meets the requirements of Item 1 above. When the ladder or steps are secured, locked, or removed, any opening created shall not allow the passage of a 4-inch-diameter (102 mm) sphere.
4. All gates or door openings through the barrier shall be equipped with self-closing and self-latching devices for keeping the door or gate securely closed at all times when the pool is not in actual use, except that the door of any dwelling that forms part of the enclosure need not be so equipped.

R326.4.1 Barrier exceptions. Spas or hot tubs with a safety cover that comply with ASTM F 1346 shall be exempt from the provisions of this appendix. Modifications in individual cases, upon a showing of good cause with respect to height, nature, or location of a fence, wall, gates, or latches, or the necessity thereof, may be made by the building official, provided the protection as sought hereunder is not reduced thereby. The building official may grant permission for other protective devices or structures to be used as long as the degree of protection afforded by this substitute device or structure is not less than the protection afforded by the wall, fence, gate, and latch described herein. A reasonable period within which to comply with the requirements of this section for existing swimming pools shall be allowed, which period shall not exceed 90 days after notification by the building official.

Commentary: *This maintains a local ordinance that requires a barrier or fence to separate a pool or spa that has a depth of water of greater than 18 inches.*

R403.1.4.1 Frost protection. Except where otherwise protected from frost, foundation walls, piers, and other permanent supports of buildings and structures shall be protected from frost by one or more of the following methods:

1. Extended below the frost line specified in Table R301.2.(1).
2. Constructed in accordance with Section R403.3.
3. Constructed in accordance with ASCE 32.
4. Erected on solid rock.

Exceptions: 1. Protection of freestanding *accessory structures* with an area of 1500 ~~600~~ square feet (139 ~~56~~ m²) or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.

2. Protection of freestanding *accessory structures* with an area of 400 square feet (37 m²) or less, of other than light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.

3. Decks not supported by a dwelling need not be provided with footings that extend below the frost line.

Footings shall not bear on frozen soil unless the frozen condition is permanent.

Commentary: This increases the allowable area of a non-occupied building from 600 to 1,500 square feet before there is a requirement for the footings and foundations to be frost protected. This would allow up to a 5-stall garage to be located on a floating slab.

R502.3.1 Sleeping areas and attic joists. Table R502.3.1(1) shall be used to determine the maximum allowable span of floor joists that support sleeping areas and *attics* that are accessed by means of a fixed stairway in accordance with Section R311.7 provided that the design live load does not exceed 40 ~~30~~ pounds per square foot (1.92 ~~1.44~~ kPa) and the design dead load does not exceed 20 pounds per square foot (0.96 kPa). The allowable span of ceiling joists that support *attics* used for limited storage or no storage shall be determined in accordance with Section R802.4.

Commentary: The referenced live load of a bedroom floor is changed from 30 to 40 psf to be consistent with the change that was made to Table R301.5, Minimum Uniformly Distributed Live Load.

R602.10.1.2 Offsets along a braced wall line. Exterior walls parallel to a *braced wall line* shall be offset not more than 4 feet (1219 mm) from the designated *braced wall line* location as shown in Figure R602.10.1.1. Interior walls used as bracing shall be offset not more than 4 feet (1219 mm) from a *braced wall line* through the interior of the building as shown in Figure R602.10.1.1.

Exception: The offset out-of-plane may exceed 4 feet (1219 mm) and the out-to-out offset dimension may exceed 8 feet (2438 mm) if the area of the offset is less than 200 square feet (18.6 m²).

Commentary: This maintains the capability to build a relatively small addition without structural engineered analysis or conventional wind bracing capability.

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

1. There shall be not more than three stories above the top of a concrete or masonry foundation or basement wall. Permanent wood foundations shall not be permitted.
2. Floors shall not cantilever more than 24 inches (607 mm) beyond the foundation or bearing wall below.
3. Wall height shall not be greater than 12 ~~10~~ feet (3,658 ~~3048~~ mm).
4. The building shall have a roof eave-to-ridge height of 20 ~~15~~ feet (6096 ~~4572~~ mm) or less.
5. Exterior walls shall have gypsum board with a minimum thickness of 1/2 inch (12.7 mm) installed on the interior side fastened in accordance with Table R702.3.5.
6. The structure shall be located where the ultimate design wind speed is less than or equal to 130 mph (58 m/s), and the exposure category is B or C.
7. The structure shall be located in Seismic Design Category A, B or C for detached one- and two-family dwellings or Seismic Design Category A or B for townhouses.
8. Cripple walls shall not be permitted in three-story buildings.

Commentary: Section R602.12 provides for a simplified prescriptive procedure for bracing wall lines for houses. This simplified set of rules avoids the complexity of changes made to braced wall panels and wall lines that was introduced into the 2009 IRC and remains in the 2015 IRC. Locally this method has been expanded to wall heights of 12 feet and eave to ridge heights of 20 feet or less.

R602.12.1 Circumscribed rectangle. The bracing required for each building shall be determined by circumscribing a rectangle around the entire building on each floor as shown in Figure R602.12.1. The rectangle shall surround all enclosed offsets and projections such as sunrooms and attached garages. Open structures, such as carports and decks, shall be permitted to be excluded. The rectangle shall not have a side greater than 80 ~~60~~ feet (24,384 ~~18,288~~ mm), and the ratio between the long side and short side shall be not greater than 3:1.

**TABLE R602.12.4
MINIMUM NUMBER OF BRACING UNITS ON EACH SIDE
OF THE CIRCUMSCRIBED RECTANGLE**

STORY LEVEL	EAVE-TO-RIDGE HEIGHT (feet)	MINIMUM NUMBER OF BRACING UNITS ON EACH LONG SIDE								MINIMUM NUMBER OF BRACING UNITS ON EACH SHORT SIDE							
		Length of short side (feet)								Length of long side (feet)							
		10	20	30	40	50	60	<u>70</u>	<u>80</u>	10	20	30	40	50	60	<u>70</u>	<u>80</u>
	10	1	2	2	2	3	3	<u>4</u>	<u>4</u>	1	2	2	2	3	3	<u>4</u>	<u>5</u>
		2	3	3	4	5	6	<u>6</u>	<u>7</u>	2	3	3	4	5	6	<u>6</u>	<u>7</u>
	20	1	2	3	3	4	4	<u>5</u>	<u>5</u>	1	2	3	3	4	4	<u>5</u>	<u>5</u>
		2	3	4	5	6	7	<u>7</u>	<u>8</u>	2	3	4	5	6	7	<u>7</u>	<u>8</u>

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm.

a. Interpolation shall not be permitted.

b. Cripple walls or wood-framed basement walls in a walk-out condition shall be designated as the first story and the stories above shall be redesignated as the second and third stories, respectively, and shall be prohibited in a three-story structure.

c. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.

d. For Exposure Category C, multiply bracing units by a factor of 1.20 for a one-story building, 1.30 for a two-story building and 1.40 for a three-story building.

Commentary: Section R602 provides for a simplified prescriptive procedure for bracing wall lines for houses. This simplified set of rules avoids the complexity of changes made to braced wall panels and wall lines that was introduced into the 2009 IRC and remains in the 2015 IRC. Whereas the 2015 IRC limits this application of wind analysis to a maximum 60-foot length houses, by local modification the simplified wind analysis has been expanded to an 80-foot maximum width.

When these requirements are met, the simplified method determines required wall bracing based on a circumscribed rectangle drawn around the exterior of the building. The intent of the ratio of the length to width is based on 3:1 or less. Long narrow buildings commonly are not intended to take advantage of this simplified criteria.

Table R602.12.4 lists the required number of bracing units for each side of the building based on the perpendicular side length of the circumscribed rectangle and the eave-to-ridge height. Once the rectangle is drawn around the building on a plan, all side lengths used to determine the required amount of bracing are taken from the circumscribed rectangle, as shown in the figure addressing maximum side length.

Bracing units located along the wall lines must meet the following requirements:

- *The first bracing unit on the wall line must begin within 12 feet of the corner.*
- *The maximum distance between the edges of two bracing units is 20 feet.*
- *Wall segments longer than 8 feet must have at least one bracing unit.*

R602.12.3 Bracing unit. A bracing unit shall be a full height sheathed segment of the exterior wall without openings or vertical or horizontal offsets and a minimum length as specified herein [for intermittent sheathing. Bracing units shall be considered per story for continuously sheathed structural wood panels.](#) Interior walls shall not contribute toward the amount of required bracing. Mixing of Items 1 and 2 is prohibited on the same story.

1. Where all framed portions of all exterior walls are sheathed in accordance with Section R602.12.2, including wall areas between bracing units, above and below openings and on gable end walls, the minimum length of a bracing unit shall be 3 feet (914 mm).

2. Where the exterior walls are braced with sheathing panels in accordance with Section R602.12.2 and areas between bracing units are covered with other materials, the minimum length of a bracing unit shall be 4 feet (1219 mm).

Commentary: This is applicable to the exterior walls being continuously sheathed with wood structural panels (WSP). If there is insufficient full height wall length per story (again a local modification) along one or more exterior wall lines, conventional wind bracing per Section R602.10 must be utilized, or there must be submitted a structural engineered analysis.

Based on the wall lines being continuously sheathed, the minimum braced wall length is 3 feet. When the bracing units are intermittent with other materials along the braced wall line, the minimum bracing unit length is 4 feet. If the bracing units are longer than the minimum, they may be considered as multiple units for the purpose of counting bracing units.

R802.11.1 Uplift resistance. Roof assemblies shall have uplift resistance in accordance with Sections R802.11.1.1 and R802.11.1.2.

Where the uplift force does not exceed 200 pounds (90.8 kg), rafters and trusses spaced not more than 24 inches (610 mm) on center shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1) and be connected to wall plate by the use of approved connectors, consisting of truss/rafter to wall connector, having a resistance to uplift of not less than 175 installed in accordance with the manufacturer's specifications or.

Where the basic wind speed does not exceed 115 mph, the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, rafters and trusses spaced not more than 24 inches (610 mm) on center shall be permitted to be attached to their supporting wall assemblies in accordance with Table R602.3(1).

Commentary: Previous editions of the IRC simply referenced a connector for 175 pounds to be installed on all trusses and rafter subject to wind uplift. The local amendment maintains the standard that all trusses have uplift connectors, but allows as an alternate the new provisions for roof connections to resist wind uplift force, which have been updated to current engineering standards. Table 802.11 has been replaced to provide accurate values for both low- and high-sloped roofs in both wind gust factors B and C.

N1101.2 (R101.3) Intent. This chapter shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each new building. Additions, alterations, renovations, or repairs to an existing building, building system or portion thereof may conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. This chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This chapter is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

Commentary: This provision mandates that any additions, alterations, or repairs comply with the same energy efficiency standards as is required for new construction, but goes on to clarify certain building elements that are exempted, which was not required in previous residential codes. This amendment clarifies that the energy efficiency standards apply to new construction but takes away the mandatory

language to provide an option in those cases when it is not practical to maintain more stringent requirements onto existing construction.

**TABLE N1102.1.1 (R402.1.1)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a**

CLIMATE ZONE	FENESTRATION U-FACTOR ^b	SKYLIGHT ^b U-FACTOR	GLAZED FENESTRATION SHGC ^{b,c}	CEILING R-VALUE	WOOD FRAME WALL R-VALUE	MASS WALL R-VALUE	FLOOR R-VALUE	BASEMENT ^c WALL R-VALUE	SLAB ^d R-VALUE	CRAWL SPACE ^e WALL VALUE
6	0.32	0.55	NR	49	20+5 or 13+10 20 or 13 + 5 ^h	15/19 19/21	30 ^g	10/13 15/19	10.4 ft	10/13 15/19

For SI: 1 foot = 304.8 mm.

a. *R*-values are minimums. *U*-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall not be less than the *R*-value specified in the table.

b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.

Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

c. “15/19” means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. “15/19” shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. “10/13” means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall. [The perimeter wall of an enclosed mechanical room is allowed to not be a component of the thermal envelope.](#)

d. R-5 shall be added to the required slab edge *R*-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.

e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.10 and Table N1101.10.

g. Or insulation sufficient to fill the framing cavity, R-19 minimum.

h. The first value is cavity insulation, the second value is continuous insulation, so “13+5” means R-13 cavity insulation plus R-5 continuous insulation.

i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.

[j. The minimum R-value for ceilings is further based on a minimum 6-inch \(152 mm\) heel height to allow the ceiling insulation to extend over the top plate.](#)

Commentary: Table N1102.1.1 (R402.1.1) requires the jurisdiction to insert those thermal envelope elements that are applicable to the Climate Zone that the jurisdiction is located. The changes to the prescriptive energy requirements that are found in Climate Zone 6 are:

- *Fenestration remains at 0.32.*
- *Skylight U-Factors remains at 0.55.*
- *Ceiling R-value remains at 49.*
- *Walls were increased from an R-20/13+5 to an R20+5/13+10 in the 2012 IRC, and it was the consensus of the HBA to maintain the status quo of a wall R-Value of the entire wall assembly to remain at 20.*
- *Basements and Crawl spaces remained from a continuous R10 or cavity R13 to a continuous R-15 or cavity R-19. Again, it was the consensus of the HBA to maintain the existing basement wall value at an R 10/13.*

N1102.2.9 (R402.2.9) Basement walls. 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.

Exception: Exterior basement walls of enclosed mechanical rooms.

Commentary: The HBA requested that the thermal envelope not extend into an enclosed mechanical room in a basement due to space limitations, and that there is a redundancy of insulating the walls when outside air is introduced into the area by either combustion air or outside air into the return air based on the new whole house ventilation requirements.

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

~~During testing: 1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weather stripping or other infiltration control measures.~~

~~2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.~~

~~3. Interior doors, if installed at the time of the test, shall be open.~~

~~4. Exterior doors for continuous ventilation systems and heat recovery ventilators shall be closed and sealed.~~

~~5. Heating and cooling systems, if installed at the time of the test, shall be turned off.~~

~~6. Supply and return registers, if installed at the time of the test, shall be fully open.~~

Commentary: This provision requires the testing of a new dwelling unit to demonstrate the building's air tightness. Section N1102.4.1.2 continues to be national mandate of the IRC to require blower door tests on every new dwelling. This provision specifies that when the blower door test determines an air infiltration rate of less than 5 air changes per hour, whole house ventilation is required. Discussions with the HBA agree that there is no need to incur the cost of a blower door test to determine that today's dwellings have an air infiltration rate of less than 5 air changes per hour. As dwelling envelopes become more air-tight, there is evidence that indoor contaminant levels are rising. Poor indoor air quality, the inability to rely on openable windows for natural ventilation with South Dakota's winters, and the decreasing rates of air-infiltration have led the code to require mechanical ventilation consisting of bringing in outside air and exhausting inside air in dwellings. This provision is modified locally to say that whole house ventilation is not required if a builder chooses to prove by means of a blower door test that the dwelling exceeds an air infiltration rate of greater than 5 air changes per hour, which by today's building practices is a very high rate of infiltration. The HBA considered such a test as an unwarranted cost to the homeowner and requested that the mandate be deleted.

~~**N1102.4.4 (R402.4.4) Rooms containing fuel-burning appliances.** Not adopted by the city. ~~In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table N1102.1.2, where the walls, floors and ceilings shall meet a minimum of the basement wall R-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section N1103. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.~~~~

~~**Exceptions:** 1. Direct vent appliances with both intake and exhaust pipes installed continuous to the outside.~~

~~2. Fireplaces and stoves complying with Sections N1102.4.2 and R1006.~~

~~*Commentary: This new provision to insulate a mechanical room where an outside combustion air opening is provided to the mechanical room was not supported by the Homebuilders Association.*~~

~~**N1103.3.2.1 (R403.3.2.1) Sealed air handler.** Not adopted by the city. ~~Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.~~~~

~~*Commentary: There is apprehension as to whether the manufacturers are held to a maximum 2 % air leakage requirement at this time. Staff has verified that major manufacturers of air handlers are not subject to the ASHRAE 193 test at this time.*~~

N1103.3.3 (R403.3.3) Duct testing (Mandatory). ~~Not adopted by the city. Ducts shall be pressure tested to determine air leakage by one of the following methods:~~

~~1. Rough in test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure if installed at the time of the test. All registers shall be taped or otherwise sealed during the test.~~

~~2. Postconstruction test: Total leakage shall be measured with a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. Registers shall be taped or otherwise sealed during the test.~~

~~**Exception:** A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.~~

~~A written report of the results of the test shall be signed by the party conducting the test and provided to the code official.~~

Commentary: The testing of duct sealing in a new house would be an expense of approximately \$400 or more. This maintains a local amendment to visually inspect for air leakage instead of having a testing and balancing company perform the test.

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

Exception: Stud spaces and floor joist cavities may be used for return air plenums

Commentary: With the local exception, the use of a floor joist and stud space that is inside of the thermal envelope is allowed to continue instead of a new mandate to require all plenums to be ducted.

N1103.5 (R403.5) Service hot water systems. Energy conservation measures for service hot water systems shall be in accordance with [Sections N1103.5.1 and N1103.5.4 the plumbing code.](#)

Commentary: This reverts any insulation of hot water services within a dwelling to the Plumbing Code.

N1104.1 (R404.1) Lighting equipment (Mandatory). ~~Not adopted by the city. Not less than 75 percent of the lamps in permanently installed lighting fixtures shall be high efficacy lamps or not less than 75 percent of the permanently installed lighting fixtures shall contain only high efficacy lamps.~~

~~**Exception:** Low voltage lighting.~~

Commentary: To conserve energy, the IRC in 2009 required 50 percent and the 2012 and 2015 IRC requires at least 75 percent of the lamps in permanently installed lighting fixtures to be compact fluorescent lamps or other high-efficacy lamps. The 75 percent requirement of CFL's may be met at the time of inspection, but the owner may install or replace with less expensive options. The provision that was eliminated in the 2009 IRC is again proposed to be deleted locally in the 2015 IRC.

N1107.1.1 (R501.1.1) Additions, alterations, or repairs: General. Additions, alterations, or repairs to an existing building, building system or portion thereof ~~may shall~~ comply with Section N1108, N1109 or N1110. Unaltered portions of the existing building or building supply system shall not be required to comply with this chapter.

N1109.1 (R503.1) General. *Alterations* to any building or structure ~~may shall~~ comply with the requirements of the code for new construction. *Alterations* shall be such that the existing building or structure is no less conforming with the provisions of this chapter than the existing building or structure was prior to the *alteration*.

Alterations to an existing building, building system or portion thereof ~~may shall~~ conform to the provisions of this chapter as they relate to new construction without requiring the unaltered portions of the existing building or building system to comply with this chapter. Alterations shall not create an unsafe or hazardous condition or overload existing building systems. *Alterations* shall be such that the existing building or structure uses no more energy than the existing building or structure prior to the *alteration*. Alterations to existing buildings shall comply with Sections N1109.1.1 through N1109.2.

N1110.1 (R504.1) General. Buildings, structures and parts thereof ~~may shall~~ be repaired in compliance with Section N1107.3 and this section. Work on non-damaged components necessary for the required *repair* of damaged components shall be considered part of the *repair* and shall not be subject to the requirements for *alterations* in this chapter. Routine maintenance required by Section N1107.3, ordinary repairs exempt from *permit*, and abatement of wear due to normal service conditions shall not be subject to the requirements for *repairs* in this section.

Commentary: These amendments clarify that the energy efficiency standards apply to new construction but takes away the mandatory language to provide an option in those cases when it is not practical to maintain more stringent requirements onto existing construction.

M1301.4 Plastic pipe, fittings and components. ~~Not adopted by the city. Plastic pipe, fittings and components shall be third party certified as conforming to NSF-14.~~

Commentary: Mechanical piping systems currently have no such rating in Sioux Falls.

M1305.1.4.1 Ground clearance. *Equipment* and *appliances* supported from the ground shall be level and firmly supported on a concrete slab or other *approved* material extending not less than ~~1 1/2 3~~ inches (~~38 76~~ mm) above the adjoining ground. Such support shall be in accordance with the manufacturer's installation instructions. *Appliances* suspended from the floor shall have a clearance of not less than 6 inches (152 mm) from the ground.

Equipment and appliances including the service areas shall be provided with a minimum 80-inch (2032 mm) headroom clearance.

Commentary: Prefab concrete slabs used to support residential appliances are not thicker than 1 1/2 inches. This additionally maintains a headroom clearance of 6 feet 8 inches to accommodate future service work for a mechanical appliance.

M1411.9 Minimum Duct size. The minimum unobstructed total area of the outside and return air ducts or openings and supply air ducts to a heat pump and/or air conditioners shall be not less than 6 square inches per 1000Btu/h (13,208 mm²/kW) output rating or as indicated by the conditions of the listing of the heat pump or air conditioner.

Commentary. The mechanical code section that used to include this requirement has been changed. Since a duct design layout is not required on every house, this ensures a minimum size for proper operation of cooling equipment.

M1502.4.2 Duct installation. Exhaust ducts shall be supported at 4-foot (1219 mm) intervals not to exceed 12 feet (3658 mm) and shall be secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Exhaust duct joints shall be sealed in accordance with Section M1601.4.1. ~~and shall be mechanically fastened.~~ Ducts shall not be joined with screws or similar fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct.

Commentary: This provision is inconsistent with the other portions of the IMC, IFGC, and the fuel gas provision of the residential code. Any protrusion of a screw into a clothes dryer exhaust would catch lint and create a fire hazard.

M1506.2 Duct length. The length of exhaust and supply ducts used with ventilating equipment shall not exceed the lengths determined in accordance with Table M1506.2 as revised.

Exception: Duct length shall not be limited where the duct system complies with the manufacturer's design criteria or where the flow rate of the installed ventilating equipment is verified by the installer or approved third party using a flow hood, flow grid or other airflow measuring device.

**TABLE M1506.2
DUCT SIZE**

Fan Airflow Rating (CFM)	0-80	81-125	126-200	201-300	Over 300
Minimum duct diameter (inches)	4	5	6	7	8

Commentary: Table M1506.2 has been revised locally because the table in the IRC that references duct length will be difficult to use and enforce. In addition, local amendments limit the allowable length of flexible duct to 14 feet.

M1506.3 Exhaust openings. Air exhaust openings shall terminate not less than 3 feet (914 mm) from property lines; 3 feet (914 mm) from operable ~~and nonoperable~~ openings into the building and 10 feet (3048 mm) from mechanical air intakes except where the opening is located 3 feet (914 mm) above the air intake. Openings shall comply with Sections R303.5.2 and R303.6. Minimum clearance between the exhaust and intake openings of an HRV/PRV system shall be in accordance with the manufacturer's installation instructions.

Commentary: There is no risk of an exhaust termination to the outside adjacent to a non-operable opening. HRV/PRV systems are UL listed, tested and engineered designed pieces of equipment and this clarifies that the manufacturer's installation instructions are applicable.

Section M1508 Subslab Soil Exhaust Systems.

M1508.1 General. When a subslab soil exhaust system is provided, the duct shall conform to the requirements of this section.

M1508.2 Materials. Subslab soil exhaust system duct material shall be air duct material listed and labeled to the requirements of UL 181 for Class 0 air ducts, or any of the following piping materials that comply with the *Plumbing Code* as building sanitary drainage and vent pipe: cast iron; galvanized steel; brass or copper pipe; copper tube of a weight not less than that of copper drainage tube, Type DWV; and plastic piping.

M1508.3 Grade. Exhaust system ducts shall not be trapped and shall have a minimum slope of 1/8 unit vertical in 12 units horizontal (1 percent slope).

M1508.4 Termination. Subslab soil exhaust system ducts shall extend through the roof and terminate at least 6 inches (152 mm) above the roof and at least 10 feet (3,048 mm) from any operable openings or air intake.

Commentary: This provision is found in an appendix chapter that has not been adopted. If it is chosen to install a sub slab soil exhaust system, this placement into Chapter 15 at least provides a standard for slope and termination requirements.

M1601.1.1 Above-ground duct systems. Above-ground duct systems shall conform to the following:

1. Equipment connected to duct systems shall be designed to limit discharge air temperature to not greater than 250°F (121°C).
2. Factory-made ducts shall be listed and labeled in accordance with UL 181 and installed in accordance with the manufacturer's instructions. Flexible air ducts shall be limited in length to 14 feet. Flexible air connectors are not allowed.
3. Fibrous glass duct construction shall conform to the SMACNA *Fibrous Glass Duct Construction Standards* or NAIMA *Fibrous Glass Duct Construction Standards*.
4. Field-fabricated and shop-fabricated metal and flexible duct constructions shall conform to the SMACNA HVAC Duct Construction Standards—Metal and Flexible except as allowed by Table M1601.1.1. Galvanized steel shall conform to ASTM A 653, except that sheet steel and strip used for duct, connectors, and round duct shall be G40 galvanized steel of lock-forming quality.

5. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125°F (52°C) and exposed surfaces are not subject to condensation.

6. *Duct systems* shall be constructed of materials having a flame spread index of not greater than 200.

7. Stud wall cavities and the spaces between solid floor joists to be used as air plenums shall comply with the following conditions:

7.1. These cavities or spaces shall not be used as a plenum for supply air.

7.2. These cavities or spaces shall not be part of a required fire-resistance-rated assembly.

7.3. Stud wall cavities shall not convey air from more than one floor level.

7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fire blocking in accordance with Section R602.8.

7.5. Stud wall cavities in the outside walls of the building envelope assemblies shall not be utilized as air plenums.

Commentary: With reference to Item 2, due to high restrictions in flexible air ducts, this material has been limited locally to a maximum length of 14 feet. With reference to Item 4, SMACNA standards are referenced in the residential code for the first time. These standards are typically used for commercial and industrial construction. The standard would have required a thicker galvanized coating, a G60, which has been modified to a G40 which is the standard thickness of galvanizing for residential ducts.

M1601.4.1 Joints, seams and connections. Longitudinal and transverse joints, seams and connections in metallic and nonmetallic ducts shall be constructed as specified in SMACNA HVAC Duct Construction Standards—Metal and Flexible and NAIMA Fibrous Glass Duct Construction Standards. Joints, longitudinal and transverse seams, and connections in ductwork outside the building thermal envelope; all return ducts located within 10 feet (3.05 m) of any appliance or all return ducts within a mechanical room; and all supply main trunk ducts and branch duct connections to the main trunk ducts shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems, liquid sealants or tapes. Tapes and mastics used to seal fibrous glass ductwork shall be listed and labeled in accordance with UL 181A and shall be marked “181A-P” for pressure-sensitive tape, “181 A-M” for mastic or “181 A-H” for heat-sensitive tape.

Tapes and mastics 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. Crimp joints for round metallic ducts shall have a contact lap of not less than 1 inch (25 mm) and shall be mechanically fastened by means of not less than three sheet-metal screws or rivets equally spaced around the joint.

Closure systems used to seal all ductwork shall be installed in accordance with the manufacturers' instructions.

- Exceptions:**
1. Spray polyurethane foam shall be permitted to be applied without additional joint seals.
 2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
 3. For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams and locking-type joints and seams of other than the snap-lock and button-lock types.

Commentary: The code has required all ducts to be sealed for the last four code cycles. The HVAC industry requested that only certain portions of a duct system necessitated sealing such as ducts outside of the thermal envelope and the ducts within the vicinity of a mechanical room due to a possible carbon monoxide mishap. The sealing of all ducts inside of the thermal envelope is considered as an additional expense as compared to the amount of air loss which occurs on an unsealed duct inside of the thermal envelope.

M1601.4.4 Support. Factory-made ducts listed in accordance with UL 181 shall be supported in accordance with the manufacturer's installation instructions. Field- and shop-fabricated fibrous glass ducts shall be supported in accordance with the SMACNA *Fibrous Glass Duct Construction Standards* or the NAIMA *Fibrous Glass Duct Construction Standards*. Field- and shop-fabricated metal and flexible ducts shall be supported in accordance with the SMACNA *HVAC Duct Construction Standards—Metal and Flexible*. Metal ducts shall be supported by 1/2-inch-wide (13 mm) 18-gage, 1-inch-wide (25 mm) 24-gage, or 1 1/2-inch-wide (39 mm) 26-gage metal straps or 12-gage galvanized wire at intervals not exceeding 10 feet (3048 mm) or other approved means.

Commentary: This maintains lesser gage of strap to accommodate residential contractors that do not have the machinery necessary to shear a thicker gage material. A 1-inch 24-gage strap is equivalent to a 1/2-inch 18-gage strap.

M2101.1 General. Hydronic piping shall conform to Table M2101.1. *Approved* piping, valves, fittings and connections shall be installed in accordance with the manufacturer's instructions. Pipe and fittings shall be rated for use at the operating temperature and pressure of the hydronic system. Used pipe, fittings, valves or other materials shall be free of foreign materials.

Exception: Polyvinyl Chloride (PVC) plastic pipe conforming to ASTM D1785 or ASTM D2241 is an allowable material for hydronic piping.

Commentary: *PVC is the piping of choice locally and is accepted in the IMC but not referenced in the IRC.*

G2407.6 (304.6) Outdoor combustion air. Outdoor *combustion* air shall be provided through opening(s) to the outdoors in accordance with Section G2407.6.1, ~~or G2407.6.2,~~ or G2407.6.3. The minimum dimension of air openings shall be not less than 3 inches (76 mm).

Combustion air intake opening shall be located a minimum of 3 feet (914 mm) from a gas meter.

G2407.6.3 Alternate combustion air sizing. As an alternate the net free area of openings, ducts, or plenums supplying air to an area containing gas- and oil-burning appliances shall be in accordance with B149.1-10, Natural Gas and Propane Installation Code, published by the Canadian Standards Association (CSA).

The combustion air duct is required to be upsized one diameter size when a dryer is installed in the same room as the combustion air.

Commentary: *This maintains a reduced size of combustion air opening, consistent with B149.1-10, Natural Gas and Propane Installation Code published by the Canadian Standards Association. This Canadian Standard has been expanded at the request of the Mechanical Board of Appeals to include appliances greater than 300,000 Btu/hr inputs.*

G2408.1 (305.1) General. *Equipment and appliances* shall be installed as required by the terms of their approval, in accordance with the conditions of listing, the manufacturer's instructions and this code. Manufacturer's installation instructions shall be available on the job site at the time of inspection. Where a code provision is less restrictive than the conditions of the listing of the *equipment or appliance* or the manufacturer's installation instructions, the conditions of the listing and the manufacturer's installation instructions shall apply.

After completion of the installation, all safety and operating controls and venting shall be tested before placing the burner in service in accordance with the manufacturer's installation instructions. The following requirements need to be recorded and affixed to the inside of the gas train access panel:

1. The rate of flow of the gas or fuel shall be adjusted to within plus or minus 5 percent of the required Btu/hr rating at the manifold pressure specified by the manufacturer. When the prevailing pressure is less than the manifold pressure specified, the rates shall be adjusted at the prevailing pressure.
2. The gas inlet pressure per the manufacturer's installation settings.
3. The temperature rise across the heat exchanger per the manufacturer's installation settings.
4. The static pressure of the supply and return ducts per the manufacturer's installation settings.

Unlisted *appliances approved* in accordance with Section G2404.3 shall be limited to uses recommended by the manufacturer and shall be installed in accordance with the manufacturer's instructions, the provisions of this code and the requirements determined by the *code official*.

Commentary: This maintains the requirement to place the furnace and/or boiler into operation in accordance with the manufacturer's installation settings. This provision is now found in the 2015 IFGC but has not yet made it into the IRC.

G2415.2 (404.2) CSST. CSST piping systems shall be installed in accordance with the terms of their approval, the conditions of listing, the manufacturer's instructions and this code.

The piping located on the exterior extending from the gas meter to the inside of the structure shall be a metallic pipe in compliance with Section G2414.4. The entrance into the structure shall be provided with the appropriate transition flange where an alternate gas piping material is utilized on the inside of the structure.

Commentary: This provides consistency with the Plumbing Code that does not allow CSST piping from the meter to the entrance into the dwelling to eliminate tampering of the gas piping and to provide a rigid pipe connection from the meter to the entrance into the structure.

G2415.3 (404.3) Prohibited locations. Piping shall not be installed in or through a ducted supply, return or exhaust, or a clothes chute, *chimney* or gas vent, dumbwaiter or elevator shaft. ~~Piping installed downstream of the point of delivery shall not extend through any townhouse unit other than the unit served by such piping.~~

Commentary: This is taken out of the IRC because it is not consistent with the Plumbing Code and Plumbing Contractors are who typically runs gas piping.

G2427.4.1.1 (503.4.1.1) (IFGS) Plastic vent joints. Plastic *pipe* and fittings used to vent *appliances* shall be installed in accordance with the *appliance* manufacturer's instructions. Solvent cement joints between CPVC and PVC pipe fittings shall be primed. ~~Where a~~ The primer ~~is required,~~ it shall be of a contrasting color.

Exception: Where compliance with this section would conflict with the appliance manufacturer's installation instructions.

Commentary: This requires all primers to be a contrasting color to be able to verify that the pipe has been adequately primed.

Part VII—Plumbing. The following chapters are not adopted by the city: Chapter 25—Plumbing Administration; Chapter 26—General Plumbing Requirements; Chapter 27—Plumbing Fixtures; Chapter 28—Water Heaters; Chapter 29—Water Supply and Distribution; Chapter 30—Sanitary Drainage; Chapter 31—Vents; Chapter 32—Traps; and Chapter 33—Storm Drainage.

The provisions of the *Plumbing Code* of the city of Sioux Falls or the most current plumbing code adopted by the South Dakota State Plumbing Commission shall apply to the installation, alterations, repairs, and replacement of plumbing systems, including equipment, appliances,

fixtures, and appurtenances, and where connected to a water or sewage system for detached one- and two-family dwellings and multiple single-family dwellings (town houses) not more than three stories high with separate means of egress and their accessory structures.

Commentary: Part VII—Plumbing, of the IRC references the International Plumbing Code. The South Dakota State Plumbing Commission has mandated the use of the Uniform Plumbing Code. To avoid inconsistencies, the plumbing chapters referenced in Part VII are not adopted by the City and instead any plumbing systems for residential construction are referenced to the Plumbing Code or the most current Uniform Plumbing Code adopted by the South Dakota State Plumbing Commission.

Part VIII—Electrical. The following chapters are not adopted by the city: Chapter 34—General Requirements; Chapter 35—Electrical Definitions; Chapter 36—Services; Chapter 37—Branch Circuit and Feeder Requirements; Chapter 38—Wiring Methods; Chapter 39—Power and Lighting Distribution; Chapter 40—Device and Luminaires; Chapter 41—Appliance Installation; Chapter 42—Swimming Pools; Chapter 43—Class 2 Remote-Control, Signaling and Power-Limited Circuits.

The provisions of the *Electrical Code* of the city of Sioux Falls or the most current code adopted National Electrical Code by the South Dakota State Electrical Commission shall apply to the installation, alteration, repair, relocation, replacement, addition to, use, or maintenance of any electrical system, apparatus, wiring, or equipment for electrical, light, heat, power, fire alarms, and associate controls for detached one- and two-family dwellings and multiple single-family dwellings (town houses) not more than three stories high with separate means of egress and their accessory structures.

Commentary: Part VIII—Electrical of the IRC references the electrical standards. The South Dakota State Electrical Commission has mandated the use of the 2014 National Electrical Code and does not recognize any inconsistencies that may be found in Part VIII of the IRC. To avoid inconsistencies, the electrical chapters referenced in Part VIII are not adopted by the City and instead any electrical systems for residential construction are referenced directly to the 2014 National Electrical Code or the most current electrical code adopted by the South Dakota State Electrical Commission.