INTRODUCED BY COUNCIL AS A WHOLE

(**3/27/23**)

BILL NO. (**#9866**) ORDINANCE NO. (**#8875**)

AN ORDINANCE PROVIDING FOR THE REPEAL OF CHAPTER 500, ARTICLE III – RESIDENTIAL CODE, OF THE CODE OF ORDINANCES OF THE CITY OF FLORISSANT, MISSOURI, AS AMENDED, RELATING TO THE BUILDING CODE AND ENACTING IN LIEU THEREOF A NEW ARTICLE III - RESIDENTIAL CODE, ON THE SAME SUBJECT WITH CERTAIN MODIFICATIONS AS HEREINAFTER SET FORTH.

WHEREAS, certain documents, three (3) copies of which have been placed on file in the office of the City Clerk ninety (90) days prior to this adoption, and said copies being marked and designated as the Residential Code of the City of Florissant are hereby adopted for the control, maintenance, and construction of structures as herein provided; and each and all of the regulations, provisions, penalties, conditions, and terms of the Residential Code of the City of Florissant are hereby referred to, adopted and made a part hereof, as if fully set out in these Chapters, with the additions, insertions, deletions and changes prescribed in this Chapter.

NOW THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF FLORISSANT, MISSOURI,

Section 1: Chapter 500, Article III, of the Code of Ordinances of the City of Florissant, Missouri (the "City") are hereby repealed and a new Chapter 500, Article III, of the Municipal Code of the City are hereby enacted in lieu thereof, all to read as follows:

Article III - Residential Code

Section 500.060 International Residential Code Adopted.

The International Residential Code, 2021 Edition, including appendixes AA, AB, AC, AD, AE, AG, AH, AJ and AK as published by the International Code Council, Inc., one (1) copy of which was on file in the office of the City Clerk for a period of ninety (90) days prior to the adoption of this Chapter and available for public use, inspection and examination, and a copy of which is attached hereto and incorporated by this reference as if fully set forth herein, is hereby adopted as the Residential Code of the City of Florissant, Missouri, subject to the amendments, additions, insertions, deletions and changes set out in **Section 500.070** of this Chapter.

Section 500.070 Additions, Insertions, Deletions and Amendments.

A. The following numbered Sections and Subsections of the International Residential Code, 2021 Edition, including appendixes AA, AB, AC, AD, AE, AG, AH, AJ and AK as published by the

International Code Council, Inc., are hereby amended by additions, insertions, deletions and amendments so that such Sections and Subsections shall read as follows:

1. **Section R101.1 Title.** (Amended) These provisions shall be known as the Residential Code for One- and Two-Family Dwellings of the City of Florissant and shall be cited as such and will be referred to herein as "this code".
2. **Section R105.2 Work exempt from permit.** (Amended) Exemption from permit requirements of this code shall not be deemed to grand 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. (Deleted)
   2. (Amended) Fence repairs if total linear feet of repair is 25% or less than the total cumulative fence length on the parcel.
   3. (Amended) Retaining walls that are not over two (2) feet in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge load.
   4. (Unchanged from code text)
   5. (Amended) Sidewalks and driveways not more than thirty (30) inches above grade and not over any basement or story above. However, any excavation in a public right-of-way requires an approval and/or excavation permit from the City of Florissant.
   6. (Amended) Painting, papering, tiling, carpeting, cabinets, countertops and similar finish work, unless it interferes with another required system, component, safety condition or requirement.
   7. (Amended) Swimming pools that are less than twenty-four (**24)** inches deep. (See International Swimming Pool and Spa Code as adopted)
   8. (Amended) Swings, playground equipment and other recreational structures or equipment accessory to detached one- and two-family dwellings.
   9. (Unchanged from code text)
   10. (Deleted)
   11. (Added) Removal and installation of exterior coverings provided the work does not interfere with other required systems or components. All newly installed exterior coverings and roofing materials must match the existing in appearance and color, texture and profile so as not to promote visual blight and shall be constructed in a workmanlike manner.

   Electrical:

   1. (Unchanged from code text)
   2. (Unchanged from code text)

3. (Unchanged from code text)
4. (Unchanged from code text)
5. (Unchanged from code text)

Gas:

1. (Unchanged from code text)
2. (Unchanged from code text)
3. (Unchanged from code text)

Mechanical:

1. (Unchanged from code text)
2. (Unchanged from code text)
3. (Unchanged from code text)
4. (Unchanged from code text)
5. (Unchanged from code text)
6. (Unchanged from code text)
7. (Unchanged from code text)
8. (Unchanged from code text)

Plumbing:

1. (Unchanged from code text)
2. (Unchanged from code text)
3. (Added) Installation of fixtures if water supply valve does not fall within the scope of work.
4. (Added) Installation, modification or replacement of under sink tailpiece, trap or drain if not concealed behind finished surfaces.

3. **Section R105.2.1 Emergency Repairs.** (Amended) Where equipment or system replacements and/or repairs must be performed in an emergency situation, the permit application shall be submitted within the next two (2) business days to the building official.
4. **Section R105.3.3 Integrated permits.** (Added) The Code Official shall be permitted to issue integrated building, plumbing, electrical and/or mechanical permits on a single permit application. The integrated permit primary applicant shall be responsible for providing the Department of Public Works copies of the plumbing, electrical and/or mechanical permit form with the name, signature and license number of the appropriate subcontractor. Any change in the identity of the named subcontractor after issuance of the permit shall result in the assessment of a transfer or revision fee in the amount specified in this Code.

5. **Section R105.7 Placement of Permit.** (Amended) The building permit authorization card and stamped approved plans shall be kept on the construction site until completion of the work. The authorization card shall be placed in a window visible from the street upon which the structure or structures face or located on the exterior of the structure facing the street in a clear waterproof container.
6. **Section R106.3.1 Approval of construction documents.** (Amended) Where the building official issues a permit, the construction documents shall be 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, may be kept at the site of work or made available at the time of inspection and shall be open to inspection by the building official or a duly authorized representative.
7. **Section R108.6 Work commencing before permit issuance.** (Amended) 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.

    Exceptions:

    1. Earthwork
    2. Stakeouts and other necessary planning procedures
8. **Section R112.1 General.** (Deleted and replaced) 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, The Board of Appeals shall be the Planning and Zoning Commission as established by the Code of Ordinances of the City of Florissant in **Section 11.1**. The building official shall be an ex officio member of the board when hearing building code appeals but shall not have a vote on any matter before the board.
9. **Section R113.4 Violation penalties.** (Amended) Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building g official, or of a permit or certificate issued under the provisions of this code, shall be subject to the penalties of **Section 100.080** of the Code of Ordinances of the City of Florissant. Each day that a violation continues after due notice has been served shall be deemed a separate offense.
10. **Section R113.5 Method of Service.** (Added) Such notice shall be deemed to be properly served upon the owner, owner's agent or upon the person responsible for the structure if a copy thereof is:

    1. Delivered personally by leaving the notice with a responsible party of suitable age and discretion;
    2. Delivered by regular mail, certified mail, first class mail, registered mail, courier service, UPS, FedEx, Amazon, or any similar service with delivery confirmation, to the most

recent known address or the mailing address according to the real estate property records of St. Louis County Missouri.

3. A copy thereof may be posted in a conspicuous place in or about the structure affected by such notice.

11. **Section 202 DEFINITIONS, STORY ABOVE GRADE PLANE.** (Amended) Any story having its finished floor surface entirely above grade plane, or in which the finished surface of the floor next above is:

    1. More than 6 feet (1829 mm) above grade plane, and
    2. More than 6 feet (1829 mm) above the finished ground level for more than 50 percent of the total building perimeter, and
    3. More than 12 feet (3658 mm) above the finished ground level at any point.

12. **Table R301.2 CLIMACTIC AND GEOGRAPHIC DESIGN CRITERIA.** (Amended)

Ground Snow Load[o]	Wind Design				Seismic Design Category[f]	Subject to Damage From			Ice Barrier Underlayment Required[h]	Flood Hazards[g]	Air Freezing Index[i]	Mean Annual Temp[j]
	Speed[d] (mph)	Topographic effects[k]	Speical wind region[l]	Wind-borne debris zone[m]		Weathering[a]	Frost line depth[b]	Termite[c]				
20	115 (51)	NO	NO	NO	C	SEVERE	30	NO	NO	TBD	1000	55.2

Ground Snow Load – **Twenty (20) Pounds Per Square Foot**

Wind Speeds – **One Hundred Fifteen (115) Miles Per Hour**

Topographic Effects **- NO**

Special Wind Region **- NO**

Wind-Borne Debris Zone – **NO**

Seismic Design Category – **C**

Weathering – **Severe**

Frost Line Depth – **Thirty (30) Inches**

Termite – **NO**

Ice Shield Underlayment Required – **NO**

Flood Hazard – See **Chapter** regulating Floodplain Management in the Florissant Code of Ordinances

Air Freezing Index – **1000**

Mean Annual Temperature – **55.2 Degrees Fahrenheit**

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

a. Where weathering requires a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code, the frost line depth strength required for weathering shall govern. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(1). The grade of masonry units shall be determined from ASTM C34, ASTM C55, ASTM C62, ASTM C73, ASTM C90, ASTM C129, ASTM C145, ASTM C216 or ASTM C652.

b. Where the frost line depth requires deeper footings than indicated in Figure R403.1(1), the frost line depth strength required for weathering shall govern. The jurisdiction shall fill in the frost line depth column with 30, 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(2). Wind exposure category shall be determined on a site-specific basis in accordance with Section R301.2.1.4.

e. The jurisdiction shall fill in this part of the table to establish the design criteria using table 10A from ACCA Manual J or established criteria determined by the jurisdiction.

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: 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); and the title and date of the currently effective Flood Insurance Study or other flood hazard study.

h. 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 R301.2(2), where there is local historical data documenting unusual wind conditions, the jurisdiction shall fill in this part of the table with "YES" and identify any specific requirements. Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

m. In accordance with Section R301.2.1.2, the jurisdiction shall indicate the wind-borne debris wind zone(s). Otherwise the jurisdiction shall indicate "NO" in this part of the table.

n. The jurisdiction shall fill in these sections of the table to establish the design criteria using Table 1a or 1b from ACCA Manual J or established criteria determined by the jurisdiction.

o. The jurisdiction shall fill in this section of the table using the Ground Snow Loads in Figure R301.2(3) and R301.2(4).

13. **Section R302.1 Exterior walls.** (Amended) Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1(1) as amended; or dwellings equipped throughout with an automatic sprinkler system installed in accordance with Section P2904 shall comply with Table R302.1(2).

    Exceptions:

    1. Walls, projections, openings or penetrations in walls perpendicular to the line used to determine the fire separation distance.
    2. Walls of individual dwelling units and their accessory structures located on the same lot.
    3. Detached tool sheds and storage sheds, playhouses and similar structures exempted from permits are not required to provide wall protection based on location on the lot. Projections beyond the exterior wall shall not extend over the lot line.
    4. Detached garages accessory to a dwelling located within 2 feet (610 mm) of a lot line are permitted to have roof eave projections not exceeding 4 inches (102 mm).
    5. Foundation vents installed in compliance with this code are permitted.
    6. Cantilevered manufactured fireplaces.
    7. Roof eave overhangs.
    8. Uncovered decks.

14. **Section R302.5.1 Opening protection.** (Amended) Openings from a private garage directly into a room used for sleeping purposes shall not be permitted. Other openings between the garage and residence shall be equipped with solid wood doors not less than 1 3/8 inches (35 mm) in thickness, solid or honeycomb-core steel doors not less than 1 3/8 inches (35 mm) thick, or 20-minute fire-rated doors and door shall be self-latching.
15. **Section R302.5.2 Duct penetration.** (Amended) Ducts in the garage and ducts penetrating the walls or ceilings separating the dwelling from the garage shall be constructed of a minimum No. 28 gage (0.378 mm) sheet steel or other approved material and shall not have openings into the garage.
16. **Section R302.13 Fire protection of floors.** (Amended) Floor assemblies that are not required elsewhere in this code to be fire-resistance rated, shall be provided with a 1/2-inch (12.7 mm) gypsum wallboard membrane, 5/8-inch (16 mm) wood structural panel membrane, or equivalent on the underside of the floor framing member. Penetrations or openings for ducts, vents, electrical outlets, lighting, devices, luminaires, wires, speakers, drainage, piping and similar openings or penetrations shall be permitted. Fire blocking, draft stopping, fire taping, and/or additional framing is not required.

    Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section P2904, NFPA 13D, or other approved equivalent sprinkler system.
2. Floor assemblies located directly over a crawl space not intended for storage or for the installation of fuel-fired or electric-powered heating appliances.
3. Portions of floor assemblies shall be permitted to be unprotected where complying with the following:
    3.1 The aggregate area of the unprotected floor assembly does not exceed 100 square feet per HVAC zone.
    3.2 Areas of the floor assembly covered by HVAC metal plenum, trunk lines, and steel structural beams shall be considered protected. Gypsum wallboard membrane shall be within 2 inches of all previously listed items.
4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch (50.8 mm by 254 mm) nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

17. **Section R303.5.2 Exhaust openings.** (Amended) Exhaust air shall not be directed below 6 feet and 8 inches onto public walkways.
18. **Section R309.5 Fire sprinklers.** (Amended) Private garages shall be protected by fire sprinklers where the garage wall has been designed based on Table 302.1(2), Note a., and the homeowner has opted to purchase a fire sprinkler system for their residence, as per Missouri Revised Statutes 67.281. 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/ft^2. Garage doors shall not be considered obstructions with respect to sprinkler placement.
19. **Section R311.3 Floors and landings at exterior doors.** (Amended) There shall be a landing or floor at each required egress exterior door. The width of each landing shall not be less than the door served. Landings shall have a dimension of not less than 36 inches (914 mm) measured in the direction of travel. The slope at exterior landings shall not exceed 1/4 unit vertical in 12 units horizontal (2 percent).

    Exception: Exterior balconies less than 60 square feet (5.6 m^2) and only accessed from a door are permitted to have a landing that is less than 36 inches (914 mm) measured in the direction of travel.

20. **Section R311.3.2 Floor elevations at other exterior doors.** (Amended) Doors other than the required egress door shall be provided with landings or floors not more than 7 3/4 inches (196 mm) below the top of the threshold.

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

21. **Section R311.7.5.2 Treads.** (Amended) The tread depth shall be not less than 10 inches (254 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

    Exceptions:

    1. For remodeling projects, such as in existing homes, homes in urban, infill or high-density developments, or historical buildings or dwellings, riser height of not more than 8 1/4 inches (210 mm) and tread depth of not more than 9 inches (229 mm) will be allowed.
    2. For remodeling projects in existing homes, stair tread and riser will be allowed to mimic previous or existing conditions.

22. **Section R312.1.1 Where required.** (Amended) Guards shall be provided for those portions of open-sided walking surfaces, including floors, stairs, ramps and landings that are located more than 30 inches (762 mm) measured vertically to the floor or grade below. Insect screening shall not be considered as a guard.

23. **Section R312.1.5 Retaining wall protection.** (Added) Guards shall be provided where retaining walls with differences in grade level on either side of the wall in excess of 30 inches are located closer than 2 feet to a walk, path, parking lot or driveway on the high side of the retaining wall.

24. **Section R312.2 Window fall protection.** (Deleted)

25. **Section R313.1 Townhouse automatic fire sprinkler systems.** (Amended) An automatic sprinkler system shall be installed in townhouses, in accordance with §67.281 of the Missouri Revised Statutes.

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

26. **Section R313.2 One- and two-family dwellings automatic sprinkler systems.** (Amended) A builder of a single-family dwelling or residence or multi-unit dwellings of four or fewer units shall offer to any purchaser on or before the time of entering into the purchase contract the option, at the purchaser's cost, to install or equip fire sprinklers in the dwelling, residence, or unit. Notwithstanding any other provision of law to the contrary, no purchaser of such a single-family dwelling, residence, or multi-unit dwelling shall be denied the right to choose or decline to install a fire sprinkler system in such dwelling or residence being purchased by any code, ordinance, rule, regulation, order, or resolution by any county or other political subdivision. Any county or other political subdivision shall provide in any such code, ordinance, rule, regulation, order, or resolution the mandatory option for purchasers to have the right to choose and the requirement that builders offer to purchasers the option to purchase fire sprinklers in connection with the purchase of any single-family dwelling, residence, or multi-unit dwelling of four or fewer units.

Exception: An automatic sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with a sprinkler system.

27. **Section R313.2 One- and two-family dwellings automatic fire systems** (Amended). Any builder of single-family dwellings or residences or multifamily dwellings of four or fewer units shall offer, in writing, to any purchaser the option to install or equip such dwellings or residences with a fire sprinkler system at the purchaser's cost in accord with the requirements of State of Missouri law, Section 67.281, RSMo. Supp. 2009.
28. **Section R323.1 General.** (Amended) This section applies to storm shelters where, constructed as separate detached buildings or where, constructed as safe rooms within buildings for the purpose of providing refuge from storms that produce high winds, such as tornadoes and hurricanes. In addition to other applicable requirements in this code, storm shelters shall be constructed in accordance with ICC 500, except when located below grade or if basement walls are fully constructed with concrete.
29. **Section R331 FENCES WALLS AND SCREENS** (Added)**.**
30. **Section R331.1 Fences general** (Added). All fences, walls and screens must be constructed in accordance with the zoning code of the City of Florissant. It shall be unlawful to erect any division, fence or screen, in whole or in part, of cloth, canvas or similar non-durable material.
31. **Section R331.2 Finished side** (Added)**.** The finished side of fences shall face all neighboring properties including streets and alleys so as to prohibit the view of fence posts and support rails from adjoining properties.

    Exception: In cases where both sides of a fence are intended to be finished, i.e. shadowbox or basket weave construction, etc.
32. **Section R401.1 Application** (Amended). The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for buildings. In addition to the provisions of this chapter, the design and construction of foundations in flood hazard areas as established by Table R301.2(1) shall meet the provisions of Section R322. Wood foundations shall be designed and installed in accordance with AWC PWF.

    Exceptions: The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

    1. In buildings that have not more than two floors and a roof.
    2. Where interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15240mm).
    3. (Added) The provisions of this chapter shall not be required for detached accessory structure foundations under two hundred (200) square feet.

       Wood foundations in Seismic Design Category D_0, D_1 or D_2 shall be designed in accordance with accepted engineering practice.
33. **R403.1.7 Footings on or adjacent to slopes.** (Amended) The placement of buildings and structures on or adjacent to slopes steeper than 1 unit vertical in 3 units horizontal (33.3-percent

slope) shall conform to Sections R403.1.7.1 through R403.1.7.4 or plans as signed and sealed by a registered engineer / design professional licensed in the State of Missouri.

34. **Section R404.1.3.2 Reinforcement for foundation walls.** (Amended) Concrete foundation walls shall be laterally supported at the top and bottom. Horizontal reinforcement shall be provided in accordance with Table R404.1.2(1). Vertical reinforcement shall be provided in accordance with Table R404.1.2(2), R404.1.2(3), R404.1.2(4), R404.1.2(5), R404.1.2(6), R404.1.2(7) or R404.1.2(8). Vertical reinforcement for flat basement walls retaining 4 feet (1219 mm) or more of unbalanced backfill is permitted to be determined in accordance with Table R404.1.2(9). For basement walls supporting above-grade concrete walls, vertical reinforcement shall be the greater of that required by Tables R404.1.2(2) through R404.1.2(8) or by Section R608.6 for the above-grade wall. In buildings assigned to Seismic Design Category D_0, D_1 or D_2, concrete foundation walls shall also comply with Section R404.1.4.2.

    Exception: Where unstable soil or ground water conditions do not exist, concrete foundation walls may be constructed in accordance with Table R404.1.2(10).

35. **Table R404.1.2(10) CONCRETE FOUNDATION WALLS** (Added)

Maximum Wall Height	Maximum Depth of Unbalanced Backfill	Minimum Nominal Wall Thickness
8’-0”	7’-6” or less	8” (Note a)
9’-0”	8’-6” or less	10” (Note b)
10’0”	9’-6” or less	12” (Note c)

Note a: Concrete foundation walls may be constructed a minimum of nominal 8 inches thick where the wall height from the top of the footing to the top of the wall does not exceed 8 feet. A minimum of two #4 reinforcing bars shall be placed horizontally in the top and bottom of the foundation wall. A minimum of two #5 reinforcing bars shall be provided around all window and door openings in concrete foundation and basement walls; bars shall extend a minimum of 24 inches beyond the corners of the openings.

Note b: Concrete foundation walls may be constructed a minimum of nominal 10 inches thick. A minimum of two #5 reinforcing bars shall be placed horizontally in the top, middle, and bottom of the foundation wall. A minimum of two #5 reinforcing bars shall be provided around all window and door openings in concrete foundation and basement walls; bars shall extend a minimum of 24 inches beyond the corners of the openings.

Note c: Concrete foundation walls may be constructed a minimum of nominal 12 inches thick. A minimum of three #5 reinforcing bars shall be placed horizontally in the top, middle, and bottom of the foundation wall. A minimum of two #5 reinforcing bars shall be provided

around all window and door openings in concrete foundation and basement walls; bars shall extend a minimum of 24 inches beyond the corners of the openings.

Note d: The concrete minimum wall thickness shall be 8 inches for foundation walls in soil classes SC, MH, ML-CL and inorganic CL when maximum wall height is 8 feet.

Note e: The concrete minimum wall thickness shall be 10 inches for foundation walls in soil classes SC, MH, ML-CL and inorganic CL when the maximum wall height is 9 feet.

Note f: The concrete minimum wall thickness shall be 12 inches for foundation walls in soil classes SC, MH, ML-CL and inorganic CL when the maximum wall height is 10 feet.

36. **Section 405.1 Concrete or masonry foundations**. (Amended) Drains shall be provided around concrete or masonry foundations that retain earth and enclose habitable or usable spaces located below grade. Drainage tiles, gravel or crushed stone drains, perforated pipe or other approved systems or materials shall be installed at or below the top of the footing or below the bottom of the slab and shall discharge by gravity or mechanical means into an approved drainage system. Gravel or crushed stone drains shall extend not less than 1 foot (305 mm) beyond the outside edge of the footing and 6 inches (152 mm) above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Except where otherwise recommended by the drain manufacturer, perforated drains shall be surrounded with an approved filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on not less than 2 inches (51 mm) of washed gravel or crushed rock not less than one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches (152 mm) of the same material.

    Exceptions:

    1. A drainage system is not required where the foundation is installed on well-drained ground or sand-gravel mixture soils according to the Unified Soil Classification System, Group I soils, as detailed in Table R405.1.
    2. Drains provided as detailed in Section R405.1.2 are approved as an alternative method to meet the requirements of this section.

37. **Section R405.1.2 Soil evaluations**. (Added) An evaluation of the soil for the presence or absence of groundwater is required. The evaluation report shall be based on either a subsurface soil investigation or satisfactory data from adjacent areas together with an inspection of the excavation prior to pouring concrete.

38. **Section R405.1.2.1 Groundwater present.** (Added) Provide drain tile, perforated pipe or other approved foundation drainage systems (such as water channel system) around perimeter of the outside of the foundation and inside the foundation. Drain discharge shall be by gravity to daylight or be connected to a basement floor sump.

39. **Section R405.1.2.2 No groundwater present.** (Added) Provide drain tile, perforated pipe or other approved foundation drainage systems (such as water channel system) around perimeter of

the outside of the foundation or inside the foundation. Drain discharge shall be by gravity to daylight or be connected to a basement floor sump.

40. **Section R405.1.2.3 Filter membranes.** (Added) An approved filter membrane shall be placed over the top of the joints/pipe perforations. The tile/pipe shall be placed on 2 inches minimum of gravel or crushed stone and have 6 inches of minimum cover.

41. **Section R405.1.2.4 Drainage system**. (Added) A drainage system shall discharge by gravity to daylight or be connected to an approved sump (15 inches in diameter x 18 inches deep with fitted cover). A sump pump shall be provided if the basement is finished or partially finished with pump discharge by an approved method.

42. **Section R506.2.3 Vapor retarder**. (Amended) A minimum 6 mil (0.006 inch; 0.152 mm) vapor retarder conforming to ASTM E1745 Class A requirements with joints lapped not less than 6 inches (152 mm) shall be placed between the concrete floor slab and the base course or the prepared subgrade where a base course does not exist

43. **Section R602.12 Simplified wall bracing.** (Amended) Buildings meeting all of the following conditions shall be permitted to be braced in accordance with this section as an alternative 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 a nominal 12 feet when using the minimum required bracing lengths specified in Table 602.12.4.

        Exception: Structural calculations and details are not required when there are no braced wall panels in that portion of a wall where the height exceeds a nominal 12 feet and that greater wall height segment is part of a prescriptive braced wall line on each of the adjacent stories.

    4. The building shall have a roof eave-to-ridge height of 15 feet (4572 mm) or less.

    5. Exterior walls shall have gypsum board with a minimum thickness of ½ inch (12.7 mm) installed on the interior side fastened in accordance with Table R702.3.5.

        Exception: Gypsum board is not required for wall bracing on exterior walls in garages.

    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, B or C for townhouses.

    8. Cripple walls shall not be permitted in three-story buildings.

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

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

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

45. **Section R602.12.3 Bracing unit.** (Amended) 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. 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). For walls with heights greater than a nominal 10 feet, the minimum length of a bracing unit shall be 4 feet (1219 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).

46. **Section R602.13 Alternate simplified bracing method for one- and two-family dwellings when the entire structure is sheathed with wood structural panels and located in wind exposure A or B.** (Added) The construction documents shall detail the locations and widths of all braced wall panels in accordance with this section.

47. **Section R602.13.1 Wood structural sheathing.** (Added) The building exterior walls shall be sheathed with 7/16 inch (11.1 mm) or thicker plywood or OSB wood structural panels. The wood structural panels shall be applied to all exterior walls, gable ends and band boards. All vertical joints between panels shall be blocked. Horizontal joints in braced wall panels shall be blocked.

48. **Section R602.13.2 Braced wall panel locations.** (Added) Braced wall panels shall be located in every exterior braced wall line in accordance with the following criteria:

    1. The outside edge of the first braced wall panel meeting the width established in Table R602.13.3 shall be a maximum of 12.5 feet (3810 mm) or less from each end of the braced wall line. The outside stud of the first braced wall panels closest to the end of the braced wall line shall be secured with a hold-down device securing the end stud to the foundation with a minimum uplift design value of 800 pounds.

        Exception: The 800 pound hold-down device is not required when the braced wall panel is placed at the end of the braced wall line and there is a 24 inch (610 mm) wide full height sheathed wall placed 90 degrees to the end of the braced wall line and panel.

2. The centerline spacing of braced wall panels in a braced wall line may not exceed 25 feet (7620 mm).

49. **Section R602.13.3 Braced wall panel widths.** (Added) Braced wall panel locations shall be shown on the floor plans or elevation views and meet the widths established in Table R602.13.3.

50. **Table 602.13.3 SIMPLIFIED BRACING PANEL WIDTHS** (Added)

		Width of Solid Panel [a, b]			
		8’ wall height	9’ wall height	10’ wall height	12’ wall height
Plywood/OSB Panel	3:1	32”	36”	40”	48”
Simplified Portal Wall[c]	6:1	16” [d]	18” [d]	20” [d]	24” [d]

a. Linear interpolation is permitted.

b. Wall height is the vertical distance from the bottom of the sole/sill plate to the top of the double top plate. An additional 2 inch (50.8 mm) variation in height is allowed for pre-cut stud framing.

c. The Simplified Portal Wall, if applicable, shall be constructed in accordance with the applicable detail in Figure R602.13.3. The designer shall provide this detail on the construction documents.

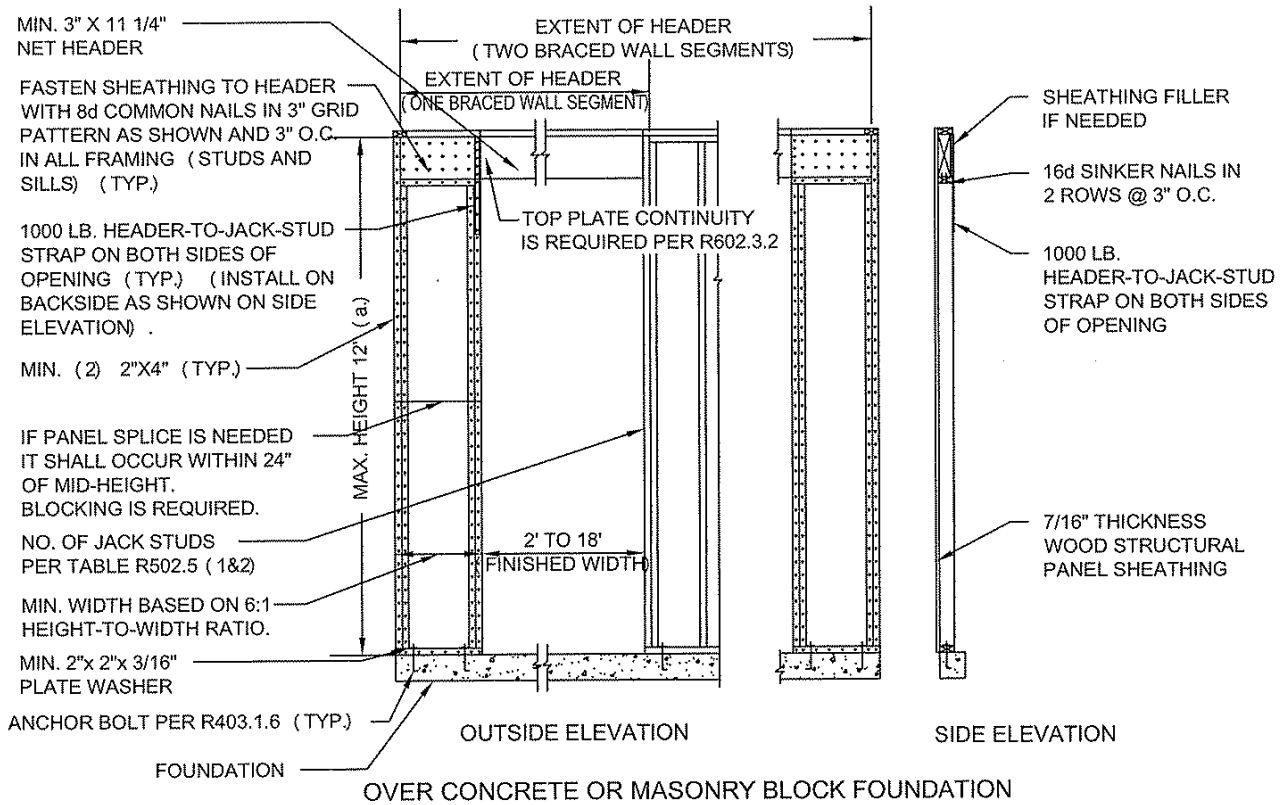
d. The Simplified Portal Wall width assumes the beam is placed under the top plate of the wall. A smaller width may be calculated for a lower top of beam height using the 6:1 height to width ratio.

51. **Section R602.13.4 Corner framing.** (Added) The exterior wall corners shall be constructed in accordance with the applicable detail in Figure R602.10.10.4.

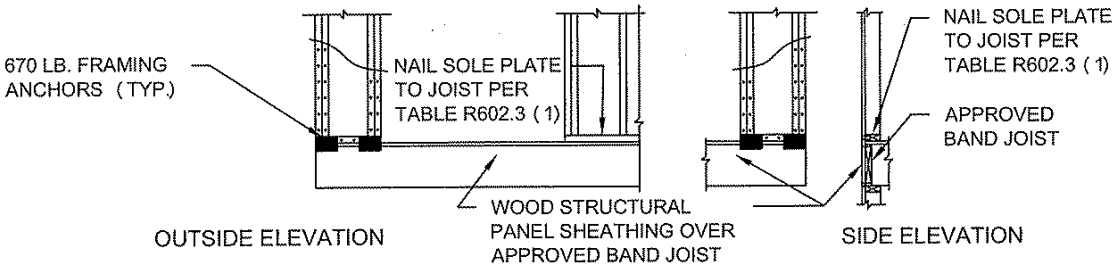
Exception: Braced wall panels located in accordance with Section R602.13.2.

52. **Section R602.13.5 Braced wall line spacing.** (Added) When the perpendicular distance between the exterior braced wall lines exceeds 50 feet (15240 mm), the registered design professional shall include the following certification on the drawings: The interior and exterior wall configuration braces for the structure in accordance with or equivalent to the lateral bracing provisions of Section R602.10 of the International Residential Code, 2009 edition or Section 2305 of the International Building Code, 2009 edition.

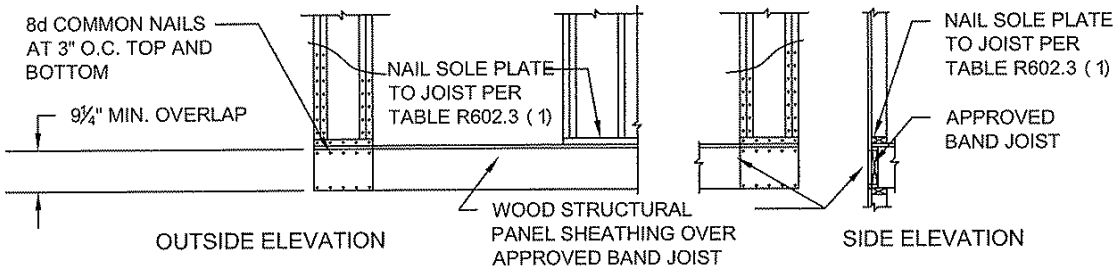
53. **Section R602.13.6 Maximum wall height.** (Added) Walls greater than 12 feet (3658 mm) (12 feet 2 inches (3708 mm) actual) in height and 12 feet (3658 mm) in width shall be designed and detailed by the registered design professional to resist wind loads in both the longitudinal and transverse directions



OVER CONCRETE OR MASONRY BLOCK FOUNDATION



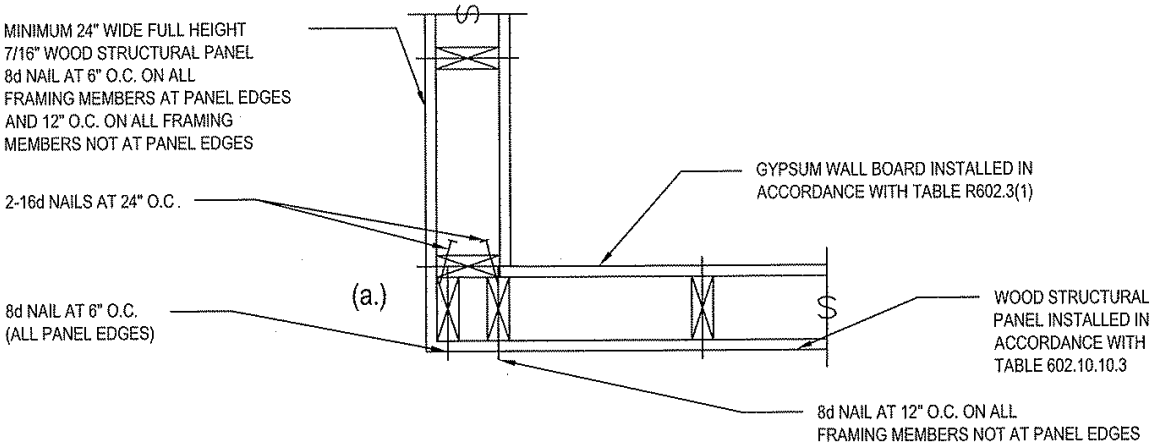
OVER RAISED WOOD FLOOR OR SECOND FLOOR
FRAMING ANCHOR OPTION



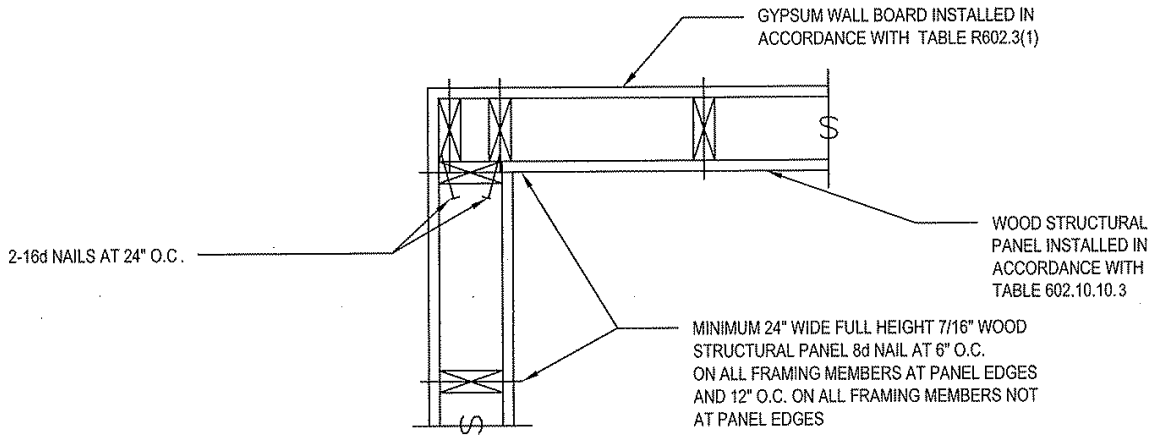
OVER RAISED WOOD FLOOR OR SECOND FLOOR
WOOD STRUCTURAL PANEL OVERLAP OPTION

FIGURE R602.10.10.3
SIMPLIFIED PORTAL WALL

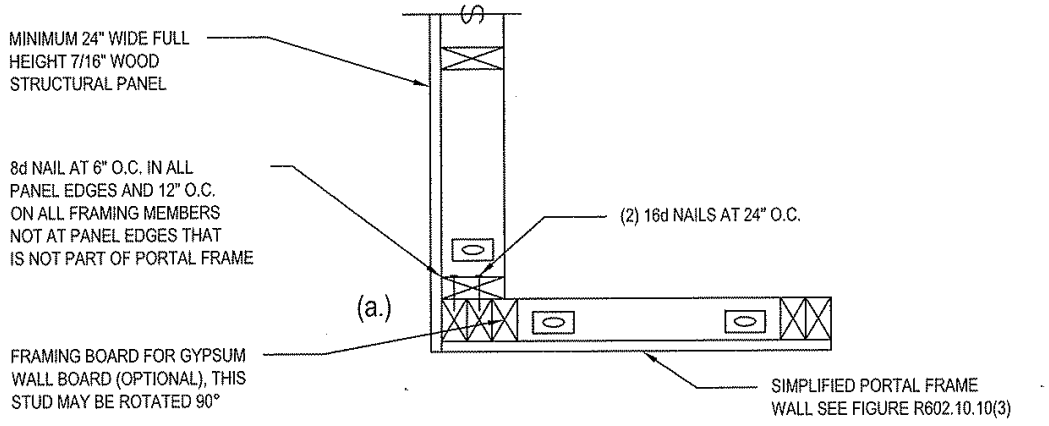
a. CRIPPLE WALL FRAMING CONSISTING OF STUD FRAMING, SINGLE BOTTOM PLATE, AND DOUBLE TOP PLATE MAY BE ADDED TO THE TOP OF THE NARROW PORTAL WALL AS LONG AS THE COMBINED HEIGHT OF THE TWO WALLS IS LESS THAN OR EQUAL TO 12 FEET AND THE TWO WALLS ARE STRAPPED TOGETHER ON THE INTERIOR SIDE WITH A 16GUAGE METAL 1 1/2 INCH WIDE BY 21 INCH LONG STRAP. A MINIMUM 10 INCHES OF THE STRAP SHALL BE CONNECTED TO EACH WALL OR GABLE TRUSS WITH 9 - 16D NAILS FOR A TOTAL OF 18-16D NAILS IN THE ENTIRE STRAP. STRAPS SHALL BE LOCATED AT EACH END OF THE CONNECTED WALLS OR WALL AND GABLE TRUSS WHERE SPACE ALLOWS FOR THE 10 INCH LENGTH OF STRAP. THE SPACING BETWEEN THE STRAPS MAY NOT EXCEED 4 FEET ON CENTER. THE STRAPS SHALL NOT BE BENT HORIZONTALLY TO ACCOMMODATE WOOD FRAMING. IF APPLICABLE, NAILERS SHALL BE ADDED TO ONE OF THE WALLS OR GABLE END USING A MINIMUM OF 9-16D NAILS TO CREATE THE VERTICAL PLANE NEEDED TO MOUNT THE STRAP.



OUTSIDE CORNER DETAIL



INSIDE CORNER DETAIL



CORNER DETAIL

USED IN CONJUNCTION WITH SIMPLIFIED PORTAL WALL

FIGURE R602.10.10.4
SIMPLIFIED BRACING EXTERIOR CORNER FRAMING

a. END STUD INDICATED ON THE ABOVE DETAILS MAY BE SHIFTED 7/16" TO ALLOW STUD FACE TO BE ALIGNED WITH SHEATHING, OR AN OPTIONAL NON-STRUCTURAL FILLER PANEL MAY BE USED.

54. **Section R905.2.8.5 Drip Edge.** (Amended) A drip edge shall be provided at eaves of shingle roofs. Adjacent segments of drip edge shall be overlapped not less than 2 inches (51 mm). Drip edges shall extend not less than 1/4 inch (6.4 mm) below the roof sheathing and extend up back onto the roof deck not less than 2 inches (51 mm). Drip edges shall be mechanically fastened to the roof deck at not more than 12 inches (305 mm) o.c. with fasteners as specified in Section R905.2.5. Underlayment shall be installed over the drip edge along eaves and under the drip edge along rake edges.

    Exception: Unless the drip edge is specifically required by the manufacturer's installation instructions, metal wrapped fascia extending 1 inch under the roof covering with the underlayment installed over it shall be deemed to meet the requirements of this section.

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

    Exception: When chimneys are installed per manufacturer's installation instructions.

56. **R1006.1.1 Factory-built fireplaces.** (Amended) Exterior combustion air ducts for factory-built fireplaces shall be a listed component of the fireplace or equivalent and shall be installed according to the fireplace manufacturer's instructions.

57. **R1006.2 Exterior air intake.** (Amended) The exterior air intake on masonry fireplaces shall be capable of supplying combustion air from the exterior of the dwelling or from spaces within the dwelling ventilated with outdoor air such as nonmechanically ventilated crawl or attic spaces. The exterior air intake shall not be located within the garage or basement of the dwelling. The exterior air intake, for other than listed factory-built fireplaces, shall not be located at an elevation higher than the firebox. The exterior air intake shall be covered with a corrosion-resistant screen of 1/4-inch (6.4 mm) mesh.

58. **Section N1101.5 (R103.2) Information on construction documents.** (Deleted)

59. **Section N1101.6 (R202) Defined terms.** (Added) **PROJECTION FACTOR.** The ratio of the horizontal depth of an overhang, eave, or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave, or permanently attached shading device.

60. **Section N1101.13 (R401.2) Application.** (Amended) Residential buildings shall comply with Section N1101.13.1, N1101.13.2, N1101.13.3 or N1101.13.4.

61. **Section N1101.13.5 (R401.2.5) Additional energy efficiency.** (Deleted)

62. **Section N1101.14 (R401.3) Certificate.** (Deleted)

63. **Table N1102.1.3 (R402.1.3) INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT[a]** (Amended)

Climate Zone	Fenestration U-Factor[b, i]	Skylight[b] U-Factor	Glazed Fenestration SHGC[b,e]	Ceiling R-Value	Wood Frame Wall R-Value[g]	Mass Wall R-Value[h]	Floor R-Value	Basement[c,g] Wall R-Value	Slab[d] R-Value & Depth	Crawl Space[c,g] Wall R-Value
0	NR	0.75	0.25	30	13 or 0 + 10	3/4	13	0	0	0
1	NR	0.75	0.25	30	13 or 0 + 10	3/4	13	0	0	0
2	0.40	0.65	0.25	49	13 or 0 + 10	4/6	13	0	0	0
3	0.30	0.55	0.25	49	20 or 13 + 5ci or 0 + 15	8/13	19	5ci or 13[f]	10ci, 2 ft	5ci or 13[f]
4 except Marine	0.40	0.55	NR	38	13	8/13	19	0 - unfinished 13 - finished	10ci, 4 ft	10ci or 13
5 and Marine 4	0.30	0.55	0.40	60	20 + 5 or 13 + 10ci or 0 + 15	13/17	30	15ci or 19 or 13 + 5ci	10ci, 4 ft	15ci or 19 or 13 + 5ci
6	0.30	0.55	NR	60	20 + 5ci or 13 + 10ci or 0 + 20	15/20	30	15ci or 19 or 13 + 5ci	10ci, 4 ft	15ci or 19 or 13 + 5ci
7 and 8	0.30	0.55	NR	60	20 + 5ci or 13 + 10ci or 0 + 20	19/21	38	15ci or 19 or 13 + 5ci	10ci, 4 ft	15ci or 19 or 13 + 5ci

For SI: 1 foot = 304.8mm.

NR = Not Required.

ci = continuous insulation.

a. R-values are minimums. U-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed R-value of the insulation shall be not 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: In Climate Zones 0 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.

c. "5ci or 13" means R-5 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "10ci or 13" means R-10 continuous insulation (ci) on the interior or exterior surface of the wall or R-13 cavity insulation on the interior side of the wall. "15ci or 19 or 13 + 5ci" means R-15 continuous insulation (ci) on the interior or exterior surface of the wall; or R-19 cavity insulation on the interior side of the wall; or R-13 cavity insulation on the interior of the wall in addition to R-5 continuous insulation on the interior or exterior surface of the wall.

d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.

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

f. Basement wall insulation shall not be required in Warm Humid locations as defined by Figure N1101.7 and Table N1101.7.

g. The first value is cavity insulation; the second value is continuous insulation. Therefore, as an example, "13 + 5" means R-13 cavity insulation plus R-5 continuous insulation.

h. Mass walls shall be in accordance with Section N1102.2.5. The second R-value applies where more than half of the insulation is on the interior of the mass wall.

i. A maximum U-factor of 0.32 shall apply in Climate Zones 3 through 8 to vertical fenestration products installed in buildings located either:

    1. Above 4,000 feet in elevation, or

    2. In windborne debris regions where protection of openings is required by Section R301.2.1.2.

64. **Section N1102.1.4 (R402.1.4) R-value computation.** (Amended) Cavity insulation alone shall be used to determine compliance with the cavity insulation R-value requirements in Table N1102.1.3. Where cavity insulation is installed in multiple layers, the R-values of the cavity insulation layers shall be summed to determine compliance with the cavity insulation R-value requirements. The manufacturer's settled R-value shall be used for blown-in insulation. Continuous insulation (ci) alone shall be used to determine compliance with the continuous insulation R-value requirements in Table N1102.1.3. Where continuous insulation is installed in multiple layers, the R-values of the continuous insulation layers shall be summed to determine compliance with the continuous insulation R-value requirements. Cavity insulation R-values shall not be used to determine compliance with the continuous insulation R-value requirements in Table N1102.1.3. Computed R-values may include an R-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table N1102.1.3, the manufacturer's labeled R-Value for insulated siding shall be reduced by R-0.6.

65. **Section N1102.1.5 (R402.1.5) Total UA alternative.** (Amended) Where the total building thermal envelope UA, the sum of U-factor times assembly area, is less than or equal to the Total UA resulting from multiplying the U-factors in Table N1102.1.2 by the same assembly area as in the proposed building, the building shall be considered to be in compliance with Table N1102.1.2. The UA calculation shall be performed using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials.

In addition to UA compliance, the SHGC requirements of Table N1102.1.2 and the maximum fenestration U-factors of Section N1102.5 shall be met.

Exception: Glazed fenestration SHGC. In Climate Zone 4, permanently shaded vertical fenestration shall be permitted to satisfy SHGC requirements. The projection factor of an overhang, eave, or permanently attached shading device shall be greater than or equal to the value listed in Table N1102.2.2.1 for the appropriate orientation. The minimum projection shall extend beyond each side of the glazing a minimum of 12 inches. Each orientation shall be rounded to the nearest cardinal orientation (+/- 45 degrees or 0.79 rad) for purposes of calculations and demonstrating compliance.

66. **Table N1102.1.5 MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION BOR SHGC EXEPTION.** (Added)

Orientation	Projection Factor
North	>=0.40 [a]
South	>=0.20
East	>=0.50
West	>=0.50

a. For the north orientation, a vertical projection located on the west-edge of the fenestration with the equivalent of PF>=0.15 shall also satisfy the minimum projection factor requirement.

67. **Section N1102.2.4 (R402.2.4) Access hatches and doors.** (Amended) Access hatches and doors from conditioned to unconditioned spaces such as attics and crawl spaces shall be insulated to R-38.

Exceptions:

1. Vertical doors providing access from conditioned spaces to unconditioned spaces that comply with the fenestration requirements of Table N1102.1.3 based on the applicable climate zone specified in Chapter 3.
2. Horizontal pull-down, stair-type access hatches in ceiling assemblies that provide access from conditioned to unconditioned spaces in Climate Zones 0 through 4 shall not be required to comply with the insulation level of the surrounding surfaces provided that the hatch meets all of the following:

   2.1. The average U-factor of the hatch shall be less than or equal to U-0.10 or have an average insulation R-value of R-10 or greater.

   2.2. Not less than 75 percent of the panel area shall have an insulation R-value of R-13 or greater.

   2.3. The net area of the framed opening shall be less than or equal to 13.5 square feet (1.25 m^2).

2.4. The perimeter of the hatch edge shall be weatherstripped.

68. **Section N1102.4 (R402.4) Air leakage.** (Amended) The building thermal envelope may be designed and constructed to limit air leakage in accordance with the requirements of Sections N1102.4.1 through N1102.4.5.

69. **Section N1102.4.1.2 (R402.4.1.2) Testing.** (Amended) Any building or dwelling unit may be tested for air leakage. The maximum design air leakage rate for any building or dwelling unit under any compliance path shall not exceed 5.0 air changes per hour or 0.28 cubic feet per minute (CFM) per square foot [0.0079 $m^3/(s \times m^2)$] of dwelling unit enclosure area. For any building or dwelling unit designed for 3.0 or less air changes per hour, testing shall be conducted in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch 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 have been sealed.

Exception: For heated, attached private garages and heated, detached private garages accessory to one-and two-family dwelling and townhouses not more than three stories above grade plane in height, building envelope tightness and insulation installation shall be considered acceptable where the items in Table N1102.4.1.1, applicable to the method of construction, are field verified. Where required by the code official, an approved third party, independent from the installer shall inspect both the air barrier and insulation installation criteria. Heated, attached private garage space shall be thermally isolated from all other conditioned spaces in accordance with Sections N1102.2.12 and N1102.3.5, as applicable.

During testing:

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping 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, where installed at the time of the test, shall be open.
4. Exterior or interior terminations for continuous ventilation systems shall be sealed.
5. Heating and cooling systems, where installed at the time of the test, shall be turned off.
6. Supply and return registers, where installed at the time of the test, shall be fully open.

Exception: When testing individual dwelling units, an air leakage rate not exceeding 0.30 cubic feet per minute per square foot [0.008$m^3/(s \times m^2)$] of the dwelling unit enclosure area, tested in accordance with ANSI/RESNET/ICC 380, ASTM E779 or ASTM E1827 and reported at a pressure of 0.2 inch water gauge (50 Pa), shall be permitted in all climate zones for:

1. Attached single- and multiple-family building dwelling units.
2. Buildings or dwelling units that are 1,500 square feet (139.4m^2) or smaller.

Mechanical ventilation shall be provided in accordance with Section M1505 of this code or Section 403.3.2 of the International Mechanical Code, as applicable, or with other approved means of ventilation.

70. **Section N1102.4.1.3 (R402.4.1.3) Leakage rate.** (Amended) Where complying with Section N1101.13.1. the building or dwelling unit shall have a design air leakage rate not exceeding 5.0 air changes per hour.

71. **Table N1102.4.1.1 (402.4.1.1)[a] AIR BARRIER AND INSULATION INSTALLATION.** (Amended)

Component	Air Barrier Criteria	Insulation Installation Criteria
General Requirements	A continuous air barrier shall be installed in the building envelope. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling or soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop-down stairs or knee wall doors to unconditioned attic spaces shall be weatherstripped.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance, R-value, of not less than R-3 per inch. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between framing and skylights, and the jambs of windows and doors, shall be sealed.	
Rim joists	Rim joists shall include an exterior air barrier.[b]	Rim joists shall be insulated.

Floors, including cantilevered floors and floors above garages	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking. Alternatively, floor framing cavity insulation shall be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing and extending from the bottom to the top of all perimeter floor framing members.
Basement crawl space, and slab foundations	Exposed earth in unvented crawl spaces shall be covered with Class I vapor retarder/air barrier in accordance with Section R402.2.10. Penetrations through concrete foundation walls and slabs shall be air sealed. Class 1 vapor retarders shall not be used as an air barrier on below-grade walls and shall be installed in accordance with Section R702.7	Crawl space insultation, where provided instead of floor insulation, shall be installed in accordance with Section R402.2.10.
Shafts, penetrations	Duct and flue shafts and other similar penetrations to exterior or unconditioned space shall be sealed to allow for expansion, contraction and mechanical vibration. Utility penetrations of the air barrier shall be caulked, gasketed or otherwise sealed and shall allow for expansion, contraction of materials and mechanical vibration.	Insulation shall be fitted tightly around utilities passing through shafts and penetrations in the building thermal envelope to maintain required R-value.
Narrow cavities	Narrow cavities of 1 inch or less that are not able to be insulated shall be air sealed.	Batts to be installed in narrow cavities shall be cut to fit or narrow cavities shall be filled with insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	Insulated portions of the garage separation assembly shall be installed in accordance with Sections R303 and R402.2.7.
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed in accordance with Section R402.4.5.	Recessed light fixtures installed in the building thermal envelope shall be airtight and IC rated, and shall be buried or surrounded with insulation.

Plumbing, wiring or other obstructions	All holes created by wiring, plumbing or other obstructions in the air barrier assembly shall be air sealed.	Insulation shall be installed to fill the available space and surround wiring, plumbing, or other obstructions, unless the required R-value can be met by installing insulation and air barrier systems completely to the exterior side of the obstructions.
Shower/tub on exterior wall		Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical and communication boxes. Alternatively, air-sealed boxes shall be installed.	
HVAC register boots	HVAC supply and return register boots that penetrate building thermal envelope shall be sealed to the subfloor, wall covering or ceiling penetrated by the boot.	
Concealed sprinklers	Where required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

For SI: 1 inch = 25.4 mm.

a. Inspection of log walls shall be in accordance with the provisions of ICC 400.

b. Air barrier and insulation full enclosure is not required in unconditioned/ventilated attic spaces and at rim joists.

72. **Section N1102.4.4 (R402.4.4) Rooms containing fuel-burning appliances.** (Amended) In Climate Zones 3 through 8, where open combustion airducts 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 that is isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table N1102.1.3, 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 an R-value of not less than 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.

3. Mechanical equipment in an unfinished space.

73. **Section N1103.3.4 (R403.3.4) Sealing.** (Amended) Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or Section M1601.4.1 of this code, as applicable.

    Exceptions:

    1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.
    2. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressure less than 2inches of water column (500 Pa) pressure classification shall not require additional closure systems.
    3. A duct air leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.

74. **Section N1103.3.5 (R403.3.5) Duct testing.** (Amended) Ducts shall be pressure tested in accordance with ANSI/RESNET/ICC 380 or ASTM E1554 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. 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.

    Exceptions:

    1. A duct air-leakage test shall not be required where the ducts and air handlers are located entirely within the building thermal envelope.
    2. A duct air-leakage test shall not be required for ducts serving heating, cooling or ventilation systems that are not integrated with ducts serving heating or cooling systems.

75. **Section N1103.3.7 (R403.3.7) Building cavities.** (Deleted)

76. **Section N1103.5.2 (R403.5.2) Hot water pipe insulation.** (Amended) Insulation for service hot water piping with a thermal resistance, R-value, of not less than R-3 shall be applied to the following:

    1. Piping larger than ¾ inch (19 mm) in nominal diameter located inside the conditioned space.
    2. Piping serving more than one dwelling unit.
    3. Piping located outside the conditioned space.
    4. Piping from the water heater to a distribution manifold.
    5. Piping located under a floor slab.

6. Buried piping.
7. Supply and return piping in circulation and recirculation systems other than cold water pipe return demand recirculation systems.

77. **Section N1103.6 (R403.6) Mechanical ventilation.** (Deleted)

78. **Section N1104.2 (R404.2) Interior lighting controls.** (Amended) Permanently installed lighting fixtures may be controlled with a dimmer, an occupant sensor control or another control that is installed or built into the fixture.

    Exceptions: Lighting controls shall not be required for the following:

    1. Bathrooms.
    2. Hallways.
    3. Exterior lighting fixtures.
    4. Lighting designed for safety or security.

79. **Section N1104.3 (R404.3) Exterior lighting controls.** (Deleted)

80. **Section M1301.2 Identification.** (Deleted)

81. **Section M1305.1.3.3 Electrical requirements.** (Amended) A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed at or near the appliance location in accordance with Chapter 39. Exposed lamps shall be protected from damage by location or lamp guards.

    Exception: Basements

82. **Section M1307.2 Anchorage of appliances.** (Amended) Appliances designed to be fixed in position shall be fastened or anchored in an approved manner. In Seismic Design Categories D_0, D_1 and D_2, water heaters and thermal storage units shall be anchored or strapped to resist horizontal displacement caused by earthquake motion in accordance with one of the following:

    1. Anchorage and strapping shall be designed to resist a horizontal force equal to one-third of the operating weight of the water heater storage tank, acting in any horizontal direction. Strapping shall be at points within the upper one-third and lower one-third of the appliance's vertical dimensions. At the lower point, the strapping shall maintain a minimum distance of 4 inches (102 mm) above the controls.
    2. The anchorage strapping shall be in accordance with the appliance manufacturer's recommendations.

83. **Section M1411.3.1.2 Appliance, equipment and insulation in pans.** (Deleted)

84. **Section M1502.4.2 Duct installation.** (Amended) Exhaust ducts shall be supported at 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.

85. **Section M1502.4.5 Booster fans.** (Amended) All dryer exhaust system booster fans must be UL listed and labeled.

86. **Section M1502.4.6.1 Specified length.** (Amended) The maximum length of the exhaust duct shall be 35 feet (10 688 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.6.1. The maximum length of the exhaust duct does not include the transition duct.

    Exception: The maximum developed length may be extended to 55 feet if clearly labeled cleanouts are provided within 12 inches of the second elbow, at every elbow thereafter, and at least every 15 feet of developed length thereafter.

87. **Section M1503.6 Makeup air required.** (Amended) Where one or more gas, liquid or solid fuel-burning appliance that is neither direct-vent nor uses a mechanical draft venting system is located within a dwelling unit's air barrier, each exhaust system capable of exhausting in excess of 600 cubic feet per minute shall be mechanically or passively provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with not fewer than one damper complying with Section M1503.6.2.

    Exception: Makeup air is not required for exhaust systems installed for the exclusive purpose of space cooling and intended to be operated only when windows or other air inlets are open.

88. **Section M1504.3 Exhaust openings.** (Amended) Air exhaust openings shall terminate as follows:

    1. Not less than 3 feet (914 mm) from gravity air intake openings, operable windows and doors.
    2. Not less than 10 feet (3048 mm) from mechanical air intake openings except where the exhaust opening is located not less than 3 feet (914 mm) above the air intake opening. Openings shall comply with Sections R303.5.2 and R303.6.

89. **Section M1601.1.1 Above-ground duct systems.** (Amended) 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^{o}F (121^{o}C).
    2. Fibrous glass duct construction shall conform to the SMACNA Fibrous Glass Duct Construction Standards or NAIMA Fibrous Glass Duct Construction Standards.
    3. 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.
    4. The use of gypsum products to construct return air ducts or plenums is permitted, provided that the air temperature does not exceed 125^{o}F (52^{o}C) and exposed surfaces are not subject to condensation.
    5. Duct systems shall be constructed of materials having a flame spread index of not greater than 200.

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

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

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

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

    6.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section R302.11. Fire-blocking materials used for isolation shall comply with Section R302.11.1.

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

    6.6. Building cavities used as plenums shall be sealed.

7. Volume dampers, equipment and other means of supply, return and exhaust air adjustment used in system balancing may be provided with access.

90. **Table M1601.1.1 DUCT CONSTRUCTION MINIMUM SHEET METAL THICKNESS FOR SINGLE DWELLING UNITS[a]** (Amended)

Round Duct Diameter (inches)	Static Pressure			
	½ inch water gage		1 inch water gage	
	Thickness (inches)		Thickness (inches)	
	Galvanized	Aluminum	Galvanized	Aluminum
≤ 12	0.013	0.018	0.013	0.018
12 to 14	0.013	0.018	0.016	0.023
15 to 17	0.016	0.023	0.019	0.027
18	0.016	0.023	0.024	0.034
19 to 20	0.019	0.027	0.024	0.034
Rectangular Duct Dimension	Static Pressure			
	½ inch water gage		1 inch water gage	

(largest dimension)	Thickness (inches)		Thickness (inches)	
	Galvanized	Aluminum	Galvanized	Aluminum
≤ 8	0.013	0.018	0.013	0.018
9 to 10	0.013	0.018	0.016	0.023
11 to 12	0.016	0.023	0.019	0.027
13 to 16	0.016	0.027	0.019	0.027
17 to 18	0.019	0.027	0.024	0.034
19 to 20	0.019	0.034	0.024	0.034

For SI: 1 inch = 25.4 mm, 1 inch water gage = 249 Pa.

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

91. **Section M1601.4.1 Joints, seams and connections.** (Amended) Joints of duct systems shall be made substantially airtight in an unconditioned area by means of tapes, mastics, liquid sealants, gasketing or other approved closure systems. Closure systems used with rigid fibrous glass ducts shall comply with UL 181A and shall be marked 181A-P for pressure-sensitive tape, 181A-M for mastic or 181A-H for heat-sensitive tape. Closure systems used with flexible air ducts and flexible air connectors shall comply with UL 181B and shall be marked 181B-FX for pressure-sensitive tape or 181B-M for mastic. Duct connections to flanges of air distribution system equipment or sheet metal fittings shall be 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 metal ducts shall have a contact lap of at least 1 inch and shall be mechanically fastened with at least three sheet metal screws or rivets equally spaced around the joint. Closure systems used to seal metal ductwork shall be installed in accordance with the manufacturer's installation 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 without access, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressure less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

92. **M1602.2 Return air openings.** Return air openings for heating, ventilation and air conditioning systems shall comply with all of the following:

1. Openings shall not be located less than 10 feet (3048 mm) measured in any direction from an open combustion chamber or draft hood of another appliance located in the same room or space.

2. Return and transfer openings shall be sized in accordance with the appliance or equipment manufacturers' installation instructions, Manual D or the design of the registered design professional.

3. Return air shall not be taken from a closet less than 64 square feet, bathroom, toilet room, kitchen, garage, mechanical room, boiler room, furnace room or unconditioned attic.

Exceptions:

1. Taking return air from a kitchen is not prohibited where such return air openings serve the kitchen only, and are located not less than 10 feet (3048 mm) from the cooking appliances.

2. Dedicated forced-air systems serving only the garage shall not be prohibited from obtaining return air from the garage.

4. For other than dedicated HVAC systems, return air shall not be taken from indoor swimming pool enclosures and associated deck areas except where the air in such spaces is dehumidified.

5. Taking return air from an unconditioned crawl space shall not be accomplished through a direct connection to the return side of a forced-air furnace. Transfer openings in the crawl space enclosure shall not be prohibited.

6. Return air from one dwelling unit shall not be discharged into another dwelling unit.

93. **Section M2101.16 CPVC plastic pipe.** (Deleted)

94. **Section M2101.22.6 Expansion tanks.** (Deleted)

95. **Section M2101.26 Pipe penetrations.** (Amended) Openings for pipe penetrations in walls, floors and ceilings shall be larger than the penetrating pipe. Openings in the foundation wall underground shall be sealed to not allow groundwater into a building.

96. **Section M2105.4 Piping and tubing materials standards.** (Amended) Ground-source heat-pump ground-loop pipe and tubing shall conform to the standards listed in Table M2105.4. However, polyvinyl chloride (PVC) and chlorinated polyvinyl chloride (CPVC) shall not be used on geothermal ground loops both inside and underground.

97. **Section M2105.9 CPVC plastic pipe.** (Deleted)

98. **Section G2408.4 (305.7) Clearances from grade.** (Amended) Equipment and appliances installed at grade level shall be supported on a level concrete slab or other approved material extending not less than 2 inches (50.8 mm) above adjoining grade or shall be suspended not

less than 6 inches (152 mm) above adjoining grade. Such supports shall be installed in accordance with the manufacturer's installation instructions.

99. **Section G2409.1 (308.1) Scope.** (Amended) This section shall govern the reduction in required clearances to combustible materials and combustible assemblies for chimneys, vents, appliances, devices and equipment. Clearance requirements for air-conditioning equipment and central heating boilers and furnaces shall comply with Sections G2409.3 and G2409.4.

100. **Section G2412.9 (401.9) Identification.** (Deleted)

101. **Section G2412.10 (401.10) Piping materials standards.** (Deleted)

102. **Section G2415.3 (404.3) Prohibited locations.** (Amended) Pipe fittings 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.

    Exception: Or installed as approved by the Authority Having Jurisdiction (AHJ), such as Ameren or Spire.

103. **Section G2439.7.4.1 (614.9.4.1) Specified length.** (Amended)The maximum length of the exhaust duct shall be 35 feet (10 688 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used, the maximum length of the exhaust duct shall be reduced in accordance with Table G2439.7.4.1. The maximum length of the exhaust duct does not include the transition duct.

    Exception: The maximum developed length may be extended to 55 feet if clearly labeled cleanouts are provided within 12 inches of the second elbow, at every elbow thereafter, and at least every 15 feet of developed length thereafter.

104. **Section G2442.3 (618.3) Prohibited sources.** (Amended) Outdoor or return air for forced-air heating and cooling systems shall not be taken from the following locations:

    1. Closer than 10 feet (3048 mm) from an appliance vent outlet, a vent opening from a plumbing drainage system or the discharge outlet of an exhaust fan, unless the outlet is 3 feet (914 mm) above the outside air inlet.
    2. Where there is the presence of objectionable odors, fumes or flammable vapors; or where located less than 10 feet (3048 mm) above the surface of any abutting public way or driveway; or where located at grade level by a sidewalk, street, alley or driveway.
    3. A hazardous or insanitary location or a refrigeration machinery room as identified in the International Mechanical Code.
    4. A room or space, the volume of which is less than 25 percent of the entire volume served by such system. Where connected by a permanent opening having an area sized in accordance with this code, adjoining rooms or spaces shall be considered as a single room or space for the purpose of determining the volume of such rooms or spaces.

        Exception: The minimum volume requirement shall not apply where the amount of return air taken from a room or space is less than or equal to the amount of supply air delivered to such room or space.

5. A room or space containing an appliance where such a room or space serves as the sole source of return air.

   Exception: This shall not apply where:

   1. The appliance is a direct-vent appliance or an appliance not requiring a vent in accordance with Section G2425.8.
   2. The room or space complies with the following requirements:

      2.1. The return air shall be taken from a room or space having a volume exceeding 1 cubic foot for each 10 Btu/h (9.6L/W) of combined input rating of all fuel-burning appliances therein.

      2.2. The volume of supply air discharged back into the same space shall be approximately equal to the volume of return air taken from the space.

      2.3. Return-air inlets shall not be located within 10 feet (3048 mm) of a draft hood in the same room or space or the combustion chamber of any atmospheric burner appliance in the same room or space.

   3. Rooms or spaces containing solid fuel-burning appliances, provided that return-air inlets are located not less than 10 feet (3048 mm) from the firebox of such appliances.

6. A closet, bathroom, toilet room, kitchen, garage, boiler room, furnace room or unconditioned attic.

   Exceptions:

   1. Where return air intakes are located not less than 10 feet (3048 mm) from cooking appliances and serve only the kitchen area, taking return air from a kitchen area shall not be prohibited.
   2. Dedicated forced air systems serving only a garage shall not be prohibited from obtaining return air from the garage
   3. Where a closet 64 square feet or greater in size is provided with a supply register, taking return air from the closet shall not be prohibited.

7. A crawl space by means of direct connection to the return side of a forced-air system. Transfer openings in the crawl space enclosure shall not be prohibited.

105. **Section P2609.1 Identification.** (Deleted)

106. **Section P2609.2 Installation of materials.** (Deleted)

107. **Section P2609.3 Plastic pipe, fittings and components.** (Deleted)

108. **Section P2609.4 Third-party certification.** (Deleted)

109. **Section P2609.5 Water Supply Systems**. (Deleted)

110. **Section P2706.2 Prohibited waste receptors.** (Amended) Plumbing fixtures that are used for washing or bathing shall not be used to receive the discharge of indirect waste piping.

    Exceptions:

1. A kitchen sink trap is acceptable for use as a receptor for a dishwasher.
2. A laundry tray is acceptable for use as a receptor for a clothes washing machine.
3. A drain or waste pipe above a trap is acceptable for use as a receptor for mechanical equipment condensate drains.

111. **Section P2801.8 Water heater seismic bracing.** (Amended) In Seismic Design Categories D_0, D_1 and D_2 water heaters shall be anchored or strapped in the upper one-third and in the lower one-third of the appliance to resist a horizontal force equal to one-third of the operating weight of the water heater, acting in any horizontal direction, or in accordance with the appliance manufacturer's recommendations.

112. **Section P3201.2.1 Trap seal protection.** (Amended) Traps seals of emergency floor drain traps and traps subject to evaporation shall be protected by one of the methods in Sections P3201.2.1.1 through P3201.2.1.4.

    Exception: Basement floor drains with a condensate line draining to it.

113. **Section E3601.8 Emergency disconnects.** (Deleted)

114. **Section E3606.5 Surge protection.** (Deleted)

115. **Section E3701.5.1 Disconnecting means**. (Amended) Each multiwire branch circuit may be provided with a means that will simultaneously disconnect all ungrounded conductors at the point where the branch circuit originates. [210.4(B)]

116. **Section E3902.2 Garage and accessory building receptacles.** (Amended) 125-volt through 250-volt receptacles installed in garages and grade-level portions of unfinished accessory buildings used for storage or work areas and supplied by single-phase branch circuits rated 150 volts or less to ground shall have ground-fault circuit-interrupter protection for personnel. [210.8(A)(2)]

    Exception: Fastened in place appliances or outlets designated for refrigerators/freezers.

117. **Section E3902.5 Basement receptacles.** (Amended) 125-volt through 250-volt receptacles installed in basements and supplied by single-phase branch circuits rated 150 volts or less to ground shall have ground-fault circuit-interrupter protection for personnel. [210.8(A)(5)]

    Exceptions:

    1. A receptacle supplying only a permanently installed fire alarm or burglar alarm system. A receptacle installed in accordance with this exception shall not be considered as meeting the requirements of Section E3901.9. Receptacles installed in accordance with this exception shall not be considered as meeting the requirement of Section E3901.9. [210.8(A)(5) Exception]
    2. Fastened in place appliances or outlets designated for refrigerators/freezers.

118. **Section E3902.6 Kitchen receptacles.** (Amended) 125-volt through 250-volt receptacles that serve countertop surfaces and are supplied by single-phase branch circuits rated 150 volts or

less to ground shall have ground-fault circuit-interrupter protection for personnel. [210.8(A)(6)]

Exception: Fastened in place appliances or outlets designated for refrigerators/freezers.

119. **Section E3902.9 Laundry areas.** (Deleted)

120. **Section E3902.11 Kitchen dishwasher branch circuit.** (Deleted)

121. **Section E3902.15 Location of ground-fault circuit interrupters.** (Amended) Ground-fault circuit interrupters shall be installed only in a readily accessible location. [210.8(A)]

122. **E3902.17 Arc-fault circuit-interrupter protection.** (Amended) Branch circuits that supply 120-volt, single phase, 15- and 20-ampere outlets installed in bedrooms shall be protected by any of following: [210.12(A)]

    1. A listed combination-type arc-fault circuit interrupter, installed to provide protection of the entire branch circuit. [210.12(A)(1)]
    2. A listed branch/feeder-type AFCI installed at the origin of the branch-circuit in combination with a listed outlet branch-circuit type arc-fault circuit interrupter installed at the first outlet box on the branch circuit. The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet of the circuit. [210.12(A)(2)]
    3. A listed supplemental arc-protection circuit breaker installed at the origin of the branch circuit in combination with a listed outlet branch-circuit type arc-fault circuit-interrupter installed at the first outlet box on the branch circuit where all of the following conditions are met:

        3.1. The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.

        3.2.The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the first outlet shall not exceed 50 feet (15.2 m) for 14 AWG conductors and 70 feet (21.3 m) for 12 AWG conductors

        3.3.The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet on the circuit. [210.12(A)(3)]

    4. A listed outlet branch-circuit-type arc-fault circuit interrupter installed at the first outlet on the branch circuit in combination with a listed branch-circuit overcurrent protective device where all of the following conditions are met:

        4.1 The branch-circuit wiring shall be continuous from the branch-circuit overcurrent device to the outlet branch-circuit arc-fault circuit interrupter.

        4.2 The maximum length of the branch-circuit wiring from the branch-circuit overcurrent device to the fist outlet shall not exceed 50 feet (15.2 m) for 14 AWG conductors and 70 feet (21.3 m) for 12 AWG conductors.

        4.3 The first outlet box in the branch circuit shall be marked to indicate that it is the first outlet on the circuit.

4.4 The combination of the branch-circuit overcurrent device and outlet branch-circuit AFCI shall be identified as meeting the requirements for a system combination-type AFCI and shall be listed as such. [210.12(A)(4)]

1. Where metal raceways, metal wireways, metal auxiliary gutters or Type MC or Type AC cable meeting the applicable requirements of Section E3908.9 with metal boxes, metal conduit bodies and metal enclosures are installed for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, a listed outlet branch-circuit type AFCI installed at the first outlet shall be considered as providing protection for the remaining portion of the branch circuit. [210.12(A)(5)]
2. Where a listed metal or nonmetallic conduit or tubing or Type MC cable is encased in not less than 2 inches (50.8 mm) of concrete for the portion of the branch circuit between the branch-circuit overcurrent device and the first outlet, a listed outlet branch-circuit type AFCI installed at the first outlet shall be considered as providing protection for the remaining portion of the branch circuit. [210.12(A)(6)]

   Exception: AFCI protection shall not be required for an individual branch circuit supplying a fire alarm system where the branch circuit is installed in a metal raceway, metal auxiliary gutter, steel-armored cable, Type MC or Type AC, meeting the requirements of Section E3908.9, with metal boxes, conduit bodies and enclosures.

123. **Section E3902.18 Arc-fault circuit interrupter protection for branch circuit extensions or modifications.** (Amended) Where branch-circuit wiring is modified, replaced, or extended in any of the areas specified in Section E3902.17, the branch circuit shall be protected by one of the following:

    1. A combination-type AFCI located at the origin of the branch circuit.
    2. An outlet branch-circuit type AFCI located at the first receptacle outlet of the existing branch circuit. [210.12(B)]

       Exception: AFCI protection shall not be required where the extension of the existing branch circuit conductors is not more than 30 feet (9.5 m) in length and does not include any additional outlets or devices other than splicing devices. This measurement shall not include the conductors inside an enclosure, cabinet or junction box. [210.12(B) Exception]

124. **Section E4002.8 Damp locations.** (Amended) A receptacle installed outdoors in a location protected from the weather or in other damp locations shall have an enclosure for the receptacle that is weatherproof when the receptacle cover(s) is closed and an attachment plug cap is not inserted. An installation suitable for wet locations shall also be considered suitable for damp locations. A receptacle shall be considered to be in a location protected from the weather where located under roofed open porches, canopies and similar structures and not subject to rain or water runoff. [406.9(A)]

125. **Section E4002.14 Tamper resistant receptacles**. (Deleted)

Section 2: This ordinance shall become in force and effect immediately upon its passage and approval.

Adopted this _____ day of _____, 2023.

_____

(name)

President of the Council

City of Florissant

Approved this _____day of _____, 2023.

_____

Timothy J. Lowery

Mayor, City of Florissant

ATTEST:

_____

Karen Goodwin, MMC/MRCC

City Clerk