

SECTION 9:

Sections 500.330 and 500.340 of Article X of Chapter 500 of Title V of the code of Ordinances of the City of O'Fallon, Missouri, are hereby repealed and two new Sections initially to be designated as 500.330 and 500.340, are hereby enacted in lieu thereof to read as follows:

TITLE V. BUILDING AND CONSTRUCTION

CHAPTER 500: BUILDING REGULATIONS

ARTICLE X: RESIDENTIAL CODE

SECTION 500.330: ADOPTION OF THE RESIDENTIAL CODE

That certain document, a copy which is on file in the office of the City Clerk of the City of O'Fallon, Missouri, being marked and designated as the International Residential Code, 2015 edition, including appendices E, G, H, I, J, K, and P, as published by the International Code Council, be and is hereby adopted as the Residential Code of the City of O'Fallon, in the State of Missouri, for regulating and governing the construction, alteration, movement, enlargement, replacement, repair, equipment, location, removal and demolition of detached one- and two-family dwellings and multiple single family dwellings (townhouses) not more than three stories in height with separate means of egress as herein provided; providing for the issuance of permits and collection of fees therefore; and each and all of the regulations, provisions, conditions and terms of said Residential Code on file in the office of the City Clerk of the City of O'Fallon, Missouri, are hereby referred to, adopted and made a part hereof, as if fully set out in this ordinance, with the additions, insertions, deletions and changes, if any, prescribed in Section 500.340.

SECTION 500.340: ADDITIONS, INSERTIONS AND CHANGES

The following numbered subsections of the International Residential Code, 2015 Edition, including appendices E, G, H, I, J, K, L, and P, as published by the International Code Council, Inc., are hereby amended by additions, insertions, deletions and changes so that such section and subsections read as follows:

(CHAPTER 1 ADMINISTRATION)

(SECTION R101 GENERAL)

R101.1 Title. These provisions shall be known as the Residential Code for One– and Two–family Dwellings of the City of O’Fallon, Missouri, and shall be cited as such and will be referred to herein as “this code.”

(SECTION R103 DEPARTMENT OF BUILDING SAFETY)

R103.2 Appointment. The building official shall be appointed as approved by ordinance.

R103.90 Work completed by licensed contractors. All mechanical, electrical, plumbing, and drainlaying work shall be performed by a contractor licensed in accordance with Sections 103.90.1 through 103.90.4.

Exceptions:

1. Work in which a permit is not required.
2. Minor work, as determined by the Building Official, when the work is performed by the owner to the dwelling in which he/she resides.

R103.90.1 Licensing of mechanical contractors. Any contractor wishing to enter into the mechanical business within the City of O’Fallon shall first be duly examined and be successfully passed and licensed by St. Charles County, Missouri, and hold an active license as Class A or Class B.

R103.90.2 Licensing of electrical contractors. Any contractor wishing to enter into the electrical business within the City of O’Fallon shall first be duly examined and be successfully passed and licensed by St. Charles County, Missouri, and hold an active license as electrical contractor.

R103.90.3 Licensing of plumbing contractors. Any contractor wishing to enter into the plumbing business within the City of O’Fallon shall first be duly examined and be successfully passed and licensed by St. Charles County, Missouri, and hold an active license as plumbing contractor.

R103.90.4 Licensing of drainlaying contractors. Any contractor wishing to enter into the drainlaying business within the City of O’Fallon shall first be duly examined and be successfully passed and licensed by St. Charles County, Missouri, and hold an active license as drainlaying contractor.

(SECTION R105 PERMITS)

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. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge, impounding Class I, II or IIIA liquids, or altering the channelized drainage of any drainage area or lot.
1. 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.
2. Sidewalks and driveways on private property and not affecting the right-of-way.
3. Painting, papering, tiling, carpeting, cabinets, counter tops, tuckpointing, siding, and similar finish work.
4. Prefabricated swimming pools that are less than 24 inches (610 mm) deep.
5. Swings and other playground equipment.
6. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support.
7. Flag poles less than 35 feet in height.
8. Replacement of doors and windows where the opening size is not increased or decreased.
9. Reroofing of asphalt shingle roofs.

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.
3. Fixture replacement with similar fixtures where plumbing connections are not relocated.

(SECTION R106 CONSTRUCTION DOCUMENTS)

R106.1 Submittal documents. Submittal documents consisting of construction documents, and other data shall be submitted as required by the Building Official. 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.

R106.90 Sprinkler verification. All applications for permit for one- and two-family dwellings shall include a written verification by the builder affirming that a fire sprinkler system was offered to the purchaser prior to entering into the purchase contract. If there is no purchaser at the time of the permit application is submitted, then said verification shall be made as soon as there is a purchaser and prior to the issuance of a certification of occupancy for the new residence.

R106.91 Elevations certified. Any building being erected or constructed in flood plain shall provide an elevation certificate from a Registered Engineer or Land Surveyor, licensed in the State of Missouri, before final approval of the foundation inspection will be given.

R106.3.1 Approval of construction documents. 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 kept at the site of work, including in the local office such as a job trailer or display home, or made available at the time of inspection and shall be open to inspection by the building official or a duly authorized representative.

(SECTION R108 FEES)

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 Section 500.470 of the City of O'Fallon municipal code.

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.

Exceptions:

1. Rough grading of lots, not to include excavating for basements
2. Stakeouts and other similar preparatory actions

(SECTION R109 INSPECTIONS)

R109.90 Workmanship. Repairs, maintenance work, alterations or installations which are caused directly or indirectly by the enforcement of this Code shall be executed and installed in a workmanlike manner in compliance with this Code, in accordance with industry standards, and in accordance with the manufacturer's installation instructions.

(SECTION R112 MEANS OF APPEAL)

R112.1 Application for Appeal. For the appeal process and requirements, see Section 113 of the Building Code.

R112.2 Limitations on Authority. Delete in its entirety.

R112.3 Qualifications. Delete in its entirety.

R112.4 Administration. Delete in its entirety.

(SECTION R113 VIOLATIONS)

R113.2 Notice of Violation. When the Building Official determines that a violation of this Code exists, he shall immediately notify the violator. The notification shall be in writing and shall be delivered to the violator or his legally authorized representative or mailed to his last known address via 1st class U.S. mail. Any person having been notified that a violation other than a stop work order exists and who fails to abate the violation within ten (10) days after notification shall be subject to the penalties enumerated in Section 113.4.

R113.4 Violation Penalties. Any person, firm or corporation who shall violate any provisions of this Ordinance, or who shall fail to comply with any of the requirements thereof, or who shall erect, construct, alter or repair a structure in violation of an approved plan or directive of the Building Official, or of a permit or certificate issued under the provisions of this Ordinance, or who shall continue any work in or about a structure after having been served a stop work order, or any owner or tenant of a building or premises in which

such violation shall exist, shall upon conviction thereof be punishable by a fine of not more than \$500.00 dollars or by imprisonment not exceeding 90 days, or by both such fine and imprisonment. Each day that a violation continues shall be deemed a separate offense.

(SECTION R114 STOP WORK ORDER)

R114.2 Unlawful Continuance. Any person who shall continue any work in or about the structure after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition(s), shall be subject to penalties as prescribed by law liable to penalties as specified in Section 113.4 of this Ordinance.

(CHAPTER 3 BUILDING PLANNING)

(SECTION R301 DESIGN CRITERIA)

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

GROUND SNOW LOAD		20 PSF
WIND DESIGN	Speed (MPH)	115 MPH
	Topographic effects	No
	Special wind region	No
	Wind-borne debris zone	No
SEISMIC DESIGN CATEGORY		SDC C
SUBJECT TO DAMAGE FROM	Weathering	Severe
	Frost line depth	30 inches
	Termite	Moderate to Heavy
WINTER DESIGN TEMP		6° F
ICE BARRIER UNDERLAYMENT REQUIRED		No
FLOOD HAZARDS		(See Floodplain Administrator)
AIR FREEZING INDEX		1000
MEAN ANNUAL TEMP		55.2° F

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 1/2-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 R301.2(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 any 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-borne debris wind zone(s). Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

R301.90 Minimum residential dwelling unit areas. The minimum residential dwelling unit area shall be in accordance with Section 500.030.

(SECTION R302 FIRE-RESISTANT CONSTRUCTION)

R302.1 Exterior walls. Construction, projections, openings and penetrations of exterior walls of dwellings and accessory buildings shall comply with Table R302.1(1); 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 dwellings and 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 protected by 5/8 Type X gypsum board that meets all setback requirements.
7. Uncovered decks.

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

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 tested in accordance with ASTM E 119

or UL 263, or the common wall shall be two independent 1-hour fire-resistance-rated wall assemblies.

R302.5.1 Opening protection. 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 honeycombcore steel doors not less than 1 3/8 inches (35 mm) thick, or 20-minute fire-rated doors.

R302.11.3 Required Fire Separation Enclosure. All prefabricated metal chimneys shall be enclosed in a fire-resistant shaft with one (1) layer of Type "X" gypsum board five-eighths (5/8) inch thick, starting from the fireplace connection to the underside of the roof sheathing, securely attached with framing materials. When the chimney chase is located on an exterior wall of the structure, it need only be separated by lining the wall between the chimney chase and the exterior wall with type "X" gypsum board five-eighths (5/8) inch (16 mm) thick.

R302.13 Fire protection of floors. 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, 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 fuel-fired 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 (7.4 m²) per story.
- 3.2. Areas of the floor assembly covered by metal plenum, trunk lines and steel structural beams shall be considered protected. The 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.

(SECTION R303 LIGHT, VENTILATION, AND HEATING)

R303.1.90 Basements and Cellars. The glass window area in basements and cellars shall not be less than one percent (1%) of the floor area served and shall be operable for natural ventilation.

R303.4 Mechanical ventilation. Where the air infiltration rate of a dwelling unit is less than 5 air changes per hour where tested with a blower door at a pressure of 0.2 inch w.c (50 Pa) in accordance with Section N1102.4.1.2, the dwelling unit shall be provided with whole-house mechanical ventilation in accordance with Section M1507.3.

R303.5.2 Exhaust openings. Exhaust air shall not be directed below 6 feet and 8 inches onto public walkways.

R303.7.90 Controls. All switches that control interior stairway lights shall be illuminated switches.

R303.8 Exterior stairway illumination. Exterior stairways shall be provided with an artificial light source. Exterior stairways providing access to a basement from the outdoor grade level shall be provided with an artificial light source located at the bottom landing of the stairway.

(SECTION R305 CEILING HEIGHT)

R305.1 Minimum height. Habitable space, hallways and portions of basements containing these spaces shall have a ceiling height of not less

than 7 feet (2134 mm). Bathrooms, toilet rooms and laundry rooms shall have a ceiling height of not less than 6 feet 8 inches (2032 mm).

Exceptions:

1. For rooms with sloped ceilings, the required floor area of the room shall have a ceiling height of not less than 5 feet (1524 mm) and not less than 50 percent of the required floor area shall have a ceiling height of not less than 7 feet (2134 mm).
2. The ceiling height above bathroom and toilet room fixtures shall be such that the fixture is capable of being used for its intended purpose. A shower or tub equipped with a showerhead shall have a ceiling height of not less than 6 feet 8 inches (2032 mm) above an area of not less than 30 inches (762 mm) by 30 inches (762 mm) at the showerhead.
3. Beams, girders, ducts or other obstructions may project to within 6 feet 6 inches of the finished floor.

(SECTION R306 SANITATION)

R306.90 Hose Bib. Every dwelling shall be equipped with one (1) outside frost proof hose bib which shall be protected from backflow in accordance with Section P2902.4.3 of this Code.

R306.91 Floor Drain. All basements shall be equipped with a floor drain within twenty (20) feet of heating / cooling system(s) and water heaters. The floor drain shall comply with Chapter 27, Section P2719 of this Code.

(SECTION R309 GARAGES AND CARPORTS)

R309.5 Fire sprinklers. Private garages shall be protected by fire sprinklers where the garage wall has been designed based on Table R302.1(2), Footnote a, and the homeowner has opted to purchase a fire sprinkler system for their residence in accordance with RSMo 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/ft². Garage doors shall not be considered obstructions with respect to sprinkler placement.

(SECTION R310 EMERGENCY ESCAPE AND RESCUE OPENINGS)

R310.1 Emergency Escape and Rescue Openings. Basements, habitable attics and every sleeping room shall have not less than one operable emergency escape and rescue opening. Where basements contain one or more sleeping rooms, an emergency escape and rescue opening shall be required in each sleeping room. Emergency escape and rescue openings shall open directly into a public way, or to a yard or court that opens to a public way.

Exceptions:

1. Storm shelters and basements used only to house mechanical equipment not exceeding a total floor area of 200 square feet.
2. Emergency escape and rescue openings are not required in basements (other than sleeping rooms) provided they were approved prior to the adoption of this ordinance.

(SECTION R311 MEANS OF EGRESS)

R311.3 Floors and landings at exterior doors. There shall be a landing or floor on each side of each exterior door. The width of each landing shall not be less than the door served. Every landing 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 to exceed 1/4 unit vertical in 12 units horizontal (2 percent).

Exceptions:

1. Exterior balconies less than 60 square feet (5.6 m²) and only accessible from a door are permitted to have a landing less than 36 inches (914 mm) measured in the direction of travel.
2. Doors that are not required egress doors and are served by a stairway no more than 4 risers.
3. Doors protected by a guard in accordance with this code.
4. Doors protected in a manner approved by the Building Official.

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

Exception:

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

R311.7.5 Stair treads and risers. Stair treads and risers shall meet the requirements of this section. For the purposes of this section, dimensions and dimensioned surfaces shall be exclusive of carpets, rugs or runners.

Exceptions:

The alteration, repair, or reconstruction of an existing stairway shall not be required to comply with this section where the existing space and construction does not allow a reduction in pitch or slope.

R311.7.6 Landings for stairways. There shall be a floor or landing at the top and bottom of each stairway. The width perpendicular to the direction of travel shall be not less than the width of the flight served. Landings of shapes other than square or rectangular shall be permitted provided that the depth at the walk line and the total area is not less than that of a quarter circle with a radius equal to the required landing width. Where the stairway has a straight run, the depth in the direction of travel shall be not less than 36 inches (914 mm).

Exceptions:

1. A floor or landing is not required at the top of an interior flight of stairs, including stairs in an enclosed garage, provided that a door does not swing over the stairs.
2. Where not required by Section R311.3 and R311.3.2.

(SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS)

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in townhouses, in accordance with R313.90.

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.

R313.2 One- and two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings in accordance with R313.90.

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.

R313.90 Sprinklers in Residential Structures. Notwithstanding the provisions of the Building Code and International Residential Code, as amended and adopted by the City of O'Fallon, Missouri, and in accordance with RSMo 67.281, a builder of one or two-family dwellings 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 one or two-family dwelling shall be denied the right to choose or decline to install a fire sprinkler system in such dwelling or residence being purchased.

(CHAPTER 4 FOUNDATIONS)

(SECTION R403 FOOTINGS)

R403.1.1 Minimum size. The minimum width, W , and thickness, T , for concrete footings shall be in accordance with Tables R403.1(1) through R403.1(4) and Figure R403.1(1) or R403.1.3, as applicable. The footing width shall be based on the load-bearing value of the soil in accordance with Table R401.4.1. Footing projections, P , shall be not less than 2 inches (51 mm) and shall not exceed the thickness of the footing. Footing thickness and projection for fireplaces shall be in accordance with Section R1001.2. The size of footings supporting piers and columns shall be based on the tributary load and allowable soil pressure in accordance with Table R401.4.1. Footings for wood foundations shall be in accordance with the details set forth in Section R403.2, and Figures R403.1(2) and R403.1(3).

Table R403.1(1)
 Minimum Width and Thickness for Concrete Footings for Light-Frame
 Construction (inches)^{a,b}

Snow Load or Roof Live Load	Story and Type of Structure with Light Frame	Load-Bearing Value of Soil (psf)					
		1500	2000	2500	3000	3500	4000
20 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	16 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	22 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – plus basement	25 x 8	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
30 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	17 x 6	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	23 x 6	17 x 6	14 x 6	12 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – plus basement	26 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
50 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	16 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus	21 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6

	basement						
	2 story – slab-on-grade	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	25 x 7	19 x 6	15 x 6	12 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	17 x 6	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	22 x 6	17 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	3 story – plus basement	28 x 9	21 x 6	17 x 6	14 x 6	12 x 6	12 x 6
70 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	18 x 6	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	24 x 7	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	16 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	21 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	27 x 9	20 x 6	16 x 6	14 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	25 x 7	18 x 6	15 x 6	12 x 6	12 x 6	12 x 6
	3 story – plus basement	30 x 10	23 x 6	18 x 6	15 x 6	13 x 6	12 x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6N/m, 1 pound per square foot = 47.9 N/m².

- Interpolation allowed. Extrapolation is not allowed.
- Based on 32-foot-wide house with load-bearing center wall that carries half of the tributary attic, and floor framing. For every 2 feet of adjustment to the width of the house, add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).

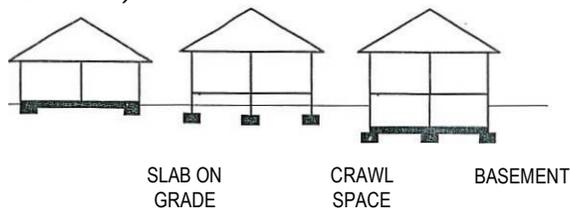


Table R403.1(2)
Minimum Width and Thickness for Concrete Footings for Light-Frame
Construction with Brick Veneer (inches)^{a,b}

Snow Load or Roof Live Load	Story and Type of Structure with Brick Veneer	Load-Bearing Value of Soil (psf)					
		1500	2000	2500	3000	3500	4000
20 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	21 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	26 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	26 x 8	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
	3 story – plus basement	32 x 11	24 x 7	19 x 6	16 x 6	14 x 6	12 x 6
30 psf	1 story – slab-on-grade	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	16 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	22 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	16 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	22 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	27 x 9	21 x 6	16 x 6	14 x 6	12 x 6	12 x 6
	3 story – slab-on-grade	21 x 6	16 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	27 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
	3 story – plus basement	33 x 11	24 x 7	20 x 6	16 x 6	14 x 6	12 x 6
50 psf	1 story – slab-on-grade	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	24 x 7	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6

	2 story – slab-on-grade	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	24 x 7	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6
	2 story – plus basement	29 x 10	22 x 6	18 x 6	15 x 6	13 x 6	12 x 6
	3 story – slab-on-grade	27 x 7	18 x 6	13 x 6	12 x 6	12 x 6	12 x 6
	3 story – with crawl space	29 x 9	22 x 6	17 x 6	14 x 6	12 x 6	12 x 6
	3 story – plus basement	35 x 12	26 x 8	21 x 6	17 x 6	15 x 6	13 x 6
70 psf	1 story – slab-on-grade	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	26 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	26 x 8	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
	2 story – plus basement	32 x 11	24 x 7	19 x 6	16 x 6	14 x 6	12 x 6
	3 story – slab-on-grade	26 x 8	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
	3 story – with crawl space	31 x 11	23 x 7	19 x 6	16 x 6	13 x 6	12 x 6
	3 story – plus basement	37 x 13	28 x 9	22 x 6	18 x 6	16 x 6	14 x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6N/m, 1 pound per square foot = 47.9 N/m².

- Interpolation allowed. Extrapolation is not allowed.
- Based on 32-foot-wide house with load-bearing center wall that carries half of the tributary attic, and floor framing. For every 2 feet of adjustment to the width of the house, add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).

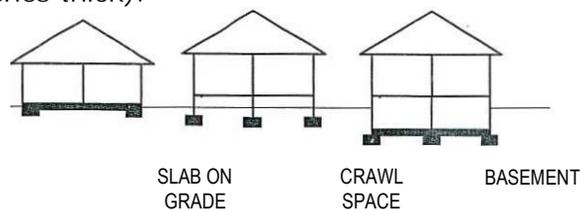


Table R403.1(3)
 Minimum Width and Thickness for Concrete Footings
 With Cast-in-Place Concrete or Fully Grouted Masonry Wall
 Construction (inches)^{a,b}

Snow Load or Roof Live Load	Story and Type of Structure with CMU	Load-Bearing Value of Soil (psf)					
		1500	2000	2500	3000	3500	4000
20 psf	1 story – slab-on-grade	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	25 x 8	19 x 6	15 x 6	13 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	23 x 7	18 x 6	14 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	29 x 9	22 x 6	17 x 6	14 x 6	12 x 6	12 x 6
	2 story – plus basement	35 x 12	26 x 8	21 x 6	17 x 6	15 x 6	13 x 6
	3 story – slab-on-grade	32 x 11	24 x 7	19 x 6	16 x 6	14 x 6	12 x 6
	3 story – with crawl space	38 x 14	28 x 9	23 x 6	19 x 6	16 x 8	14 x 6
	3 story – plus basement	43 x 17	33 x 11	26 x 8	22 x 6	19 x 6	16 x 6
30 psf	1 story – slab-on-grade	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	20 x 6	15 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	26 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	24 x 7	18 x 6	15 x 6	12 x 6	12 x 6	12 x 6
	2 story – with crawl space	30 x 10	22 x 6	18 x 6	15 x 6	13 x 6	12 x 6
	2 story – plus basement	36 x 13	27 x 8	21 x 6	18 x 6	15 x 6	13 x 6
	3 story – slab-on-grade	33 x 12	25 x 7	20 x 6	17 x 6	14 x 6	12 x 6
	3 story – with crawl space	39 x 14	29 x 9	23 x 7	19 x 6	17 x 6	14 x 6
	3 story – plus basement	44 x 17	33 x 12	27 x 8	22 x 6	19 x 6	17 x 6
50 psf	1 story – slab-on-grade	17 x 6	13 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	22 x 6	17 x 6	13 x 6	12 x 6	12 x 6	12 x 6

	1 story – plus basement	28 x 9	21 x 6	17 x 6	14 x 6	12 x 6	12 x 6
	2 story – slab-on-grade	27 x 8	20 x 6	16 x 6	13 x 6	12 x 6	12 x 6
	2 story – with crawl space	32 x 11	24 x 7	19 x 6	16 x 6	14 x 6	12 x 6
	2 story – plus basement	38 x 14	28 x 9	23 x 6	19 x 6	16 x 6	14 x 6
	3 story – slab-on-grade	35 x 13	27 x 8	21 x 6	18 x 6	15 x 6	13 x 6
	3 story – with crawl space	41 x 15	31 x 10	24 x 7	20 x 6	17 x 6	15 x 6
	3 story – plus basement	47 x 18	35 x 12	28 x 9	23 x 7	20 x 6	17 x 6
70 psf	1 story – slab-on-grade	19 x 6	14 x 6	12 x 6	12 x 6	12 x 6	12 x 6
	1 story – with crawl space	25 x 7	18 x 6	15 x 6	12 x 6	12 x 6	12 x 6
	1 story – plus basement	30 x 10	23 x 6	18 x 6	15 x 6	13 x 6	12 x 6
	2 story – slab-on-grade	29 x 9	22 x 6	17 x 6	14 x 6	12 x 6	12 x 6
	2 story – with crawl space	34 x 12	26 x 8	21 x 6	17 x 6	15 x 6	13 x 6
	2 story – plus basement	40 x 15	30 x 10	24 x 7	20 x 6	17 x 6	15 x 6
	3 story – slab-on-grade	38 x 14	28 x 9	23 x 6	19 x 6	16 x 6	14 x 6
	3 story – with crawl space	43 x 16	32 x 11	26 x 8	21 x 6	18 x 6	16 x 6
	3 story – plus basement	49 x 19	37 x 13	29 x 10	24 x 7	21 x 6	18 x 6

For SI: 1 inch = 25.4 mm, 1 plf = 14.6N/m, 1 pound per square foot = 47.9 N/m².

- Interpolation allowed. Extrapolation is not allowed.
- Based on 32-foot-wide house with load-bearing center wall that carries half of the tributary attic, and floor framing. For every 2 feet of adjustment to the width of the house, add or subtract 2 inches of footing width and 1 inch of footing thickness (but not less than 6 inches thick).

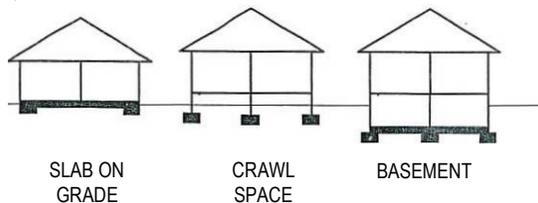


Table R403.1(4)
Minimum Width of Concrete, Precast, or Masonry Footings (inches)
for Light-Frame Construction with Pre-Fabricated Roof Trusses^{a,b,c}

	Load-Bearing Value of Soil (psf)			
	1500	2000	3000	4000
Conventional light-frame construction with pre-fabricated trusses				
1 story	12	12	12	12
2 story	15	12	12	12
3 story	23	17	12	12
4-inch brick veneer over light frame or 8-inch hollow concrete masonry				
1 story	12	12	12	12
2 story	21	16	12	12
3 story	32	24	16	12
8-inch solid or fully grouted masonry				
1 story	16	12	12	12
2 story	29	21	14	12
3 story	42	32	21	16

For SI: 1 inch = 25.4 mm, 1 pound per square foot = 0.0479 kPa

- a. Spread footings shall be same thickness as the wall (minimum of 8 inches).
- b. Where minimum footing width is 12 inches, use of a single wythe of solid or fully grouted 12-inch nominal concrete masonry units is permitted.
- c. Snow Load or Roof Live Load shall not exceed 20 psf. If load exceeds 20 psf, designs must be completed by a licensed design professional.

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, other than garages, with an area of 200 square feet or less, of light-frame construction, with an eave height of 10 feet (3048 mm) or less shall not be required.

2. 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.

R403.1.7 Footings on or adjacent to slopes. The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33.3-percent slope) shall conform to Sections R403.1.7.1 through R403.1.7.4. or designed and sealed by a registered engineer with approval from the Building Official.

(SECTION R404 FOUNDATION AND RETAINING WALLS)

R404.1.3.2 Reinforcement for foundation walls. Concrete foundation walls shall be laterally supported at the top and bottom. Horizontal reinforcement shall be provided in accordance with Table R404.1.2(10). Vertical reinforcement is permitted to 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 D0, D1 or D2, concrete foundation walls shall also comply with Section R404.1.4.2.

Table R404.1.2(10)
Concrete Foundation Walls

Maximum Wall Height	Maximum Depth of Unbalanced Backfill	Minimum Nominal Wall Thickness
7'-0"	6'-0" or less 7'-0"	8" 10" (Note a)
8'-0"	6'-0 or less 7'-0" 8'-0"	8" (Note a) 8" (Note a) 8" (Note a)

9'-0"	6'-0" or less	10" (Note b)
	7'-0"	10" (Note b)
	8'-0"	10" (Note b)
	9'-0"	10" (Note b)
10'0"	9'0"	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.

(SECTION R405 FOUNDATION DRAINAGE)

R405.1 Concrete or masonry foundations. 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 area to be protected 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 (305mm) beyond the outside edge of the footing and 6 inches (152 mm) above the top of the footing and be covered with an approved filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Except where otherwise recommended by the drain manufacturer, perforated drains shall be surrounded with an approved filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on a minimum of 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 R405.1.90 are approved as an alternative method to meet the requirements of this section.

R405.1.90 Soil evaluations. 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.

R405.1.90.1 Groundwater present. Provide drain tile, perforated pipe or other approved foundation drainage systems 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.

R405.1.90.2 No groundwater present. Provide drain tile, perforated pipe or other approved foundation drainage systems 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.

R405.1.90.3 Filter membranes. 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.

R405.1.90.4 Drainage system. A drainage system shall discharge by gravity to daylight or be connected to an approved sump with pump.

(CHAPTER 5 FLOORS)

(SECTION 507 EXTERIOR DECKS)

R507.2.4 Deck lateral load connection. The lateral load connection required by Section R507.1 shall be one of the following methods:

1. In accordance with Figure R507.2.3(1) with hold-down tension devices installed in not less than two locations per deck, within 24 inches of each end of the deck. Each device shall have an allowable stress design capacity of not less than 1,500 pounds (6672 N).
2. In accordance with Figure R507.2.3(2) with hold-down tension devices installed in not less than four locations per deck, and each device shall have an allowable stress design capacity of not less than 750 pounds (3336 N).
3. Using knee braces extending from the floor system to the posts.
4. Using a diagonal brace across the floor system installed below the floor system and attached using a (2) 10d nails through the brace into each joist, or by a metal diagonal brace "cut-in" and attached to the top chords of the joist.

5. Full depth burial of the deck posts.

(CHAPTER 6 WALL CONSTRUCTION)

(SECTION 602 WOOD WALL FRAMING)

R602.7.5 Supports for headers. Headers shall be supported on each end with one or more jack studs or with approved framing anchors in accordance with Table R602.7(1) or R602.7.(2). The full-height stud adjacent to each end of the header shall be end nailed to each end of the header with four-16d nails (3.5 inches x 0.135 inches). The minimum number of full-height studs at each end of a header shall be in accordance with Table R602.7.5.

Table R602.7.5
MINIMUM NUMBER OF FULL HEIGHT STUDS AT EACH END OF
HEADERS IN EXTERIOR WALLS^a

Maximum Header Span (feet)	Ultimate Design Wind Speed and Exposure Category	
	<140mph, Exposure B or <130mph, Exposure C	115mph, Exposure B ^b
4	1	1
6	2	1
8	2	1
10	3	2
12	3	2
14	3	2
16	4	2
18	4	2

- a. For header spans between those given above, use the minimum number of full-height studs associated with the larger header span.
- b. The tabulated minimum number of full-height studs is applicable where jack studs are provided to support the header at each end in accordance with Table R602.7.(1). Where a framing anchor is used to support the header in lieu of a jack stud in accordance with footnote "d" of Table R602.7.(1), the minimum number of full-height studs at each end of a header shall be in accordance with requirements for wind speed <140mph, Exposure B.

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 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.

602.12.1 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 602.12.1. 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 60 feet (18,288 mm), and the ratio between the long side and short side shall not be greater than 3:1.

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

1. Wood structural panels with a minimum thickness of 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).

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. 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).

(CHAPTER 9 ROOF ASSEMBLIES)

(SECTION 905 REQUIREMENTS FOR ROOF COVERINGS)

R905.2.8.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

1. For open valleys (valley lining exposed) lined with metal, the valley lining shall be not less than twenty-four (24) inches (610 mm) wide and be of any of the corrosion-resistant metals in Table R905.2.8.2.
2. For open valleys, valley lining of two (2) plies of mineral-surfaced roll roofing, complying with ASTM D 3909 or ASTM D 6380 Class M, shall be permitted. The bottom layer shall be eighteen (18) inches (457 mm) and the top layer not less than thirty-six (36) inches (914 mm) wide.
3. For closed valleys (valley covered with shingles), valley lining of two (2) plies of No. 15 felt complying with ASTM D 226 Type 1, ASTM D 4869 Type 1, or ASTM D 6757, or valley lining as described in Item 1 and 2 shall be permitted. Self-adhering polymer modified bitumen underlayment complying with ASTM D 1970 shall be permitted in lieu of the lining material.

R905.2.8.5 Drip edge. A drip edge shall be provided at eaves and rake edges of shingle roofs. Adjacent segments of drip edge shall be overlapped not less than 2 inches (51 mm). Drip edges shall extend not less than 1/4 inch (6.4 mm) below the roof sheathing and extend up back onto the roof deck not less than 2 inches (51 mm). Drip edges shall be mechanically fastened to the roof deck at not 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 underlayment along rake edges.

Exception:

Unless drip edge specifically is required by the Manufacturer's Installation Instructions of the roofing, 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.

(CHAPTER 10 CHIMNEYS AND FIREPLACES)

(SECTION 1005 FACTORY-BUILT CHIMNEYS)

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

Exception:

When allowed by the manufacturer's installation instructions.

(CHAPTER 11 ENERGY EFFICIENCY)

(SECTION N1101 GENERAL)

N1101.6 Defined terms. Add definition:

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.

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

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

N1101.14 (R401.3) Certificate (Mandatory). Unless otherwise presented to the home owner and building official in writing, a permanent certificate shall be completed by the builder or registered design professional and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall list the predominant R-values of insulation installed in or on ceiling/roof, walls, foundation (slab, basement wall, crawl space wall and/or floor) and ducts outside conditioned spaces; U-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration; and the results from

any required duct system and building envelope air leakage testing done on the building. Where there is more than one (1) value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be listed for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters.

Exception:

Homes built using a masterplan shall provide a code block outlining the basic energy elements of the home listed above and a copy of this information will be provided to the buyer of the home.

(SECTION N1102 BUILDING THERMAL ENVELOPE)

TABLE N1102.1.2 (R402.1.2)
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT^a

CLIMATE ZONE	4	
FENESTRATION U-FACTOR	0.35	
SKYLIGHT U-FACTOR	0.60	See Note B
GLAZED FENESTRATION SHGC	NR	
CEILING R-VALUE	38	
WOOD FRAME WALL R-VALUE	13	
MASS WALL R-VALUE	8/13	See Note I
FLOOR R-VALUE	19	
BASEMENT WALL R-VALUE	0	See Note J
SLAB R-VALUE AND DEPTH	10, 2 ft	See Note D

CRAWL SPACE WALL R-VALUE	10/13	See Note C
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- 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.
- 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.
- 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. --
- f. --
- g. --
- h. --
- i. The second R-value applies when more than half of the insulation is on the interior of the mass wall.
- j. Band boards and cripple walls shall be insulated to R-13.

N1102.1.5 (R402.1.5) Total UA alternative. If the total building envelope UA (sum of U-factor times assembly area) is less than or equal to the total UA resulting from using the U-factors in Table N1102.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1.2. The UA calculation shall be done using a method consistent with the ASHRAE

Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to UA compliance.

Exception:

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.

TABLE N1102.1.5
MINIMUM PROJECTION FACTOR REQUIRED BY ORIENTATION FOR
SHGC EXCEPTION

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 $PF \geq 0.15$ shall also satisfy the minimum projection factor requirement.

N1102.4.1 (R402.4.1) Building thermal envelope. The building thermal envelope shall comply with Sections N1102.4.1.1 and either N1102.4.1.2 or N1102.4.1.90. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

TABLE N1102.4.1.1 (402.4.1.1)
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General	A continuous air barrier	Air-permeable insulation

requirements	<p>shall be installed in the building envelope.</p> <p>The exterior thermal envelope contains a continuous air barrier.</p> <p>Breaks or joints in the air barrier shall be sealed.</p>	shall not be used as a sealing material.
Ceiling/attic	<p>The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed.</p> <p>Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.</p>	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	<p>The junction of the foundation and sill plate shall be sealed.</p> <p>The junction of the top plate and the top of exterior walls shall be sealed.</p> <p>Knee walls shall be sealed.</p>	<p>Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum.</p> <p>Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.</p>
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.

Floors (including above garage and cantilevered floors)	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, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing; and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawl space walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall	Recessed light fixtures installed in the building thermal envelope shall be

	be sealed to the drywall by means such as, but not limited to, a gasketed fixture.	air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate the building thermal envelope shall be sealed.	
Concealed sprinklers	When 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.	

- a. In addition, inspection of log walls shall be in accordance with the provisions of ICC 400.

N1102.4.1.2 (R402.4.1.2) Testing option. If testing is elected, the building or dwelling unit shall be tested and verified as having an air leakage rate of less than five air changes per hour in Zone 4. 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.

N1102.4.1.90 Inspection option. The items listed in Table N1102.4.1.1 (402.4.1.1), applicable to the method of construction, are field verified.

N1102.4.4 (R402.4.4) Rooms containing fuel-burning appliances. 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.
3. Mechanical equipment in an unfinished space.

(SECTION N1103 SYSTEMS)

N1103.1.1 (R403.1.1) Programmable thermostat. Delete in its entirety.

N1103.3.3 (R403.3.3) Duct testing (Optional). Ducts may 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 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.

N1103.3.5 (R403.3.5) Building cavities (Mandatory). Delete in its entirety.

N1103.4.1 (R403.4.1) Protection of piping insulation. Piping insulation exposed to weather shall be protected from damage, including that caused by sunlight, moisture, equipment maintenance and wind, and shall provide shielding from solar radiation that can cause degradation of the material. Adhesive tape shall not be permitted.

Exception: Line sets between the structure and the condensing unit.

N1103.5.3 (R405.5.3) Hot water pipe insulation (Prescriptive). Insulation for hot water pipe with a minimum thermal resistance (R-value) of R-3 shall be applied to the following:

1. Piping larger than $\frac{3}{4}$ inch (19 mm) in nominal diameter.
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 in piping.
7. Supply and return piping in recirculation systems other than demand recirculation systems.

N1103.6 (R403.6) Mechanical ventilation (Mandatory where required by N1102.4.1.2). If, in accordance with N1102.4.1.2, the resulting air changes per hour (ACH) at 50 pascals is less than 5 air changes per hour, the building shall be provided with ventilation that meets the requirements of Section M1507 of this code or the International Mechanical Code, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating.

(SECTION N1104 ELECTRICAL POWER AND LIGHTING SYSTEMS)

N1104.1 (R404.1) Lighting equipment (Optional). 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.

(SECTION N1105 SIMULATED PERFORMANCE ALTERNATIVE)

TABLE N1105.5.2(1) [R405.5.2(1)]
SPECIFICATIONS FOR THE STANDARD REFERENCE AND PROPOSED DESIGNS

BUILDING COMPONENT	STANDARD REFERENCED DESIGN	PROPOSED DESIGN
Above-grade walls	Type: mass wall if proposed wall is mass; otherwise wood frame	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
	Solar absorptance = 0.75	As proposed
	Remittance = 0.90	As proposed
Basement and crawl space walls	Type: same as proposed	As proposed
	Gross area: same as proposed	As proposed
	U-factor: from Table N1102.1.4, with insulation layer on interior side of walls	As proposed
Above-grade floors	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
Ceilings	Type: wood frame	As proposed
	Gross area: same as proposed	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
Roofs	Type: composition shingle on wood sheathing	As proposed
	Gross area: same as proposed	As proposed
	Solar absorptance = 0.75	As proposed
	Emittance = 0.90	As proposed
Attics	Type: vented with aperture = 1 ft ² per 300 ft ² ceiling area	As proposed
Foundations	Type: same as proposed	As proposed
	Foundation wall area above and below grade and soil characteristics: same as proposed	As proposed

Opaque doors	Area: 40 ft ²	As proposed
	Orientation: North	As proposed
	U-factor: same as fenestration from Table N1102.1.4	As proposed
Vertical fenestration other than opaque doors	Total area ^b = 15% of the conditioned floor area	As proposed
	Orientation: equally distributed to 4 cardinal compass orientations (N, E, S and W)	As proposed
	U-factor: as specified in Table N1102.1.4	As proposed
	SHGC: as specified in Table N1102.1.2, except that for climates with no requirement (NR) SHGC = 0.40 shall be used	As proposed
	Interior shade fraction: 0.92 - (0.21 x SHGC for the standard reference design)	0.92 - (0.21 x SHGC as proposed)
	External shading: none	As proposed
Skylights	None	As proposed
Thermally isolated sunrooms	None	As proposed
Air exchange rate	<p>Air leakage rate of 5 air changes per hour at a pressure of 0.2 inches w.g. (50 Pa). The mechanical ventilation rate shall be in addition to the air leakage rate and the same as in the proposed design, but no greater than $0.01 \times \text{CFA} + 7.5 \times (\text{N}_{\text{br}} + 1)$. Where:</p> <p>CFA = conditioned floor area N_{br} = number of bedrooms Energy recovery shall not be assumed for mechanical ventilation.</p>	<p>For residences that are not tested, the same air leakage rate as the standard reference design. For tested residences, the measured air exchange rate^a. The mechanical ventilation</p>

		rate ^b shall be in addition to the air leakage rate and shall be proposed.
Mechanical ventilation	None, except where mechanical ventilation is specified by the proposed design, in which case: Annual vent fan energy use: kWh/yr = $0.03942 \times \text{CFA} + 29.565 \times (\text{N}_{\text{br}} + 1)$ Where: CFA = conditioned floor area N_{br} = number of bedrooms	As proposed
Internal gains	$\text{IGain} = 17,900 + 23.8 \times \text{CFA} + 4104 \times \text{N}_{\text{br}}$ (Btu/day per dwelling unit)	Same as standard reference design
Internal mass	An internal mass for furniture and contents of 8 pounds per square foot of floor area	Same as standard reference design, plus any additional mass specifically designed as a thermal storage element ^c but not integral to the building envelope or structure.
Structural mass	For masonry floor slabs, 80% of floor area covered by R-2 carpet and pad, and 20% of floor directly exposed to room air	As proposed
	For masonry basement walls, as proposed, but with insulation required by Table R402.1.4 located on the interior side of the walls	As proposed
	For other walls, for ceilings, floors, and	As proposed

	interior walls, wood frame construction	
Heating systems ^{d, e}	Fuel type: same as the proposed design Efficiencies: Electric: air-source heat pump with prevailing federal minimum standards. Non-electric furnaces: natural gas furnace with prevailing federal minimum standards. Non-electric boilers: natural gas boiler with prevailing federal minimum standards. Capacity: sized in accordance with Section N1103.7.	As proposed
Cooling systems ^{d, f}	Fuel type: electric Efficiency: in accordance with prevailing federal minimum standards Capacity: sized in accordance with Section N1103.7	As proposed
Service water heating ^{d, e, f}	Fuel type; same as proposed design Efficiency: in accordance with prevailing federal minimum standards Use: gal/day = 30 + 10 x N _{br} Tank temperature: 120° F. Where: N _{br} = number of bedrooms	As proposed Same as standard reference
Thermal distribution systems	Duct insulation: from Section N1103.2.1 A thermal distribution system efficiency (DSE) of 0.88 shall be applied to both the heating and cooling system efficiencies for all systems other than tested duct systems. For tested duct systems, the leakage rate shall be 4 cfm (113.3 L/min) per 100 ft ² (9.29 m ²) of conditioned floor area at a pressure of differential of 0.1 inches w.g. (25 Pa)	As tested or specified in Table R405.5.2(2) if not tested. Duct insulation shall be as proposed.
Thermostat	Type: Manual, cooling temperature setpoint = 75° F. Heating temperature setpoint = 72° F.	Same as standard reference

For SI: 1 square foot = 0.93 m²; 1 British thermal unit = 1055J; 1 pound per square foot = 4.88 kg/m²; 1 gallon (US) = 3.785 L; °C = (°F-32)/1.8; 1 degree = 0.79 rad

- a. Where required by the code official, testing shall be conducted by an approved party. Hourly calculations as specified in the ASHRAE Handbook of Fundamentals, or the equivalent, shall be used to determine the energy loads resulting from infiltration.
- b. The combined air exchange rate for infiltration and mechanical ventilation shall be determined in accordance with Equation 43 of 2001 ASHRAE Handbook of Fundamentals, page 26.24, and the "Whole-house Ventilation" provisions of 2001 ASHRAE Handbook of Fundamentals, page 26.19, for intermittent mechanical ventilation.
- c. Thermal storage element shall mean a component not part of the floors, walls or ceilings that is part of a passive solar system, and that provides thermal storage such as enclosed water columns, rock beds, or phase-change containers. A thermal storage element must be in the same room as fenestration that faces within 15 degrees (0.26 rad) of true south, or must be connected to such a room with pipes or ducts that allow the element to be actively charged.
- d. For a proposed design with multiple heating, cooling or water heating systems using different fuel types, the applicable standard reference design system capacities and fuel types shall be weighted in accordance with their respective loads as calculated by accepted engineering practice for each equipment and fuel type present.
- e. For a proposed design without a proposed heating system, a heating system with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and proposed design.
- f. For a proposed design home without a proposed cooling system, an electric air conditioner with the prevailing federal minimum efficiency shall be assumed for both the standard reference design and the proposed design.

- g. For a proposed design with a non-storage-type water heater, a forty-gallon storage-type water heater with the prevailing federal minimum energy factor for the same fuel as the predominant heating fuel type shall be assumed. For the case of a proposed design without a proposed water heater, a forty-gallon storage-type water heater with the prevailing federal minimum efficiency for the same fuel as the predominant heating fuel type shall be assumed for both the proposed design and standard reference design.

(CHAPTER 13 GENERAL MECHANICAL SYSTEM REQUIREMENTS)

(SECTION M1301 GENERAL)

M1301.2 Identification. Each length of pipe and tubing, as produced by the manufacturer and prior to use in the field, shall bear the identification of the manufacturer. Each pipe fitting utilized in a mechanical system shall bear the identification of the manufacturer.

Exception: Line sets and similar materials provided the installer can provide documentation related to the material used such as, but not limited to, a receipt, invoice, or container.

(SECTION M1305 APPLIANCE ACCESS)

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 2 inches above the adjoining ground. Such support shall be in accordance with the manufacturer's installation instructions. Appliances suspended from the floor shall have clearances of not less than 6 inches from the ground.

M1305.1.4.3 Electrical requirements. A luminaire controlled by a switch located at the required passageway opening and a receptacle outlet shall be installed 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

M1307.2 Anchorage of appliances. Appliances designed to be fixed in position shall be fastened or anchored in an approved manner. In Seismic Design Categories D0, D1 and D2, 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.

(CHAPTER 14 HEATING AND COOLING EQUIPMENT AND APPLIANCES)

(SECTION M1411 HEATING AND COOLING EQUIPMENT)

M1411.3.1 Auxiliary and secondary drain systems. In addition to the requirements of Section M1411.3, a secondary drain or auxiliary drain pan shall be required for each cooling or evaporator coil where damage to any building components will occur as a result of overflow from the equipment drain pan or stoppage in the condensate drain piping. Such piping shall maintain a minimum horizontal slope in the direction of discharge or not less than 1/8 unit vertical in 12 units horizontal (1-percent slope). Drain piping shall be not less than 3/4-inch (19 mm) nominal pipe size. One of the following methods shall be used:

1. An auxiliary drain pan with a separate drain shall be installed under the coils on which condensation will occur. The auxiliary pan drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The pan shall have a minimum depth of 1.5 inches (38 mm), shall be not less than 3 inches (76 mm) larger than the unit or the coil dimensions in width and length and shall be constructed of corrosion-resistant material. Galvanized sheet steel pans shall have a minimum thickness of not

less than No. 26 Gage. Nonmetallic pans shall have a minimum thickness of not less than 0.0625 inch (1.6 mm).

2. A separate overflow drain line shall be connected to the drain pan installed with the equipment. This overflow drain shall discharge to a conspicuous point of disposal to alert occupants in the event of a stoppage of the primary drain. The overflow drain line shall connect to the drain pan at a higher level than the primary drain connection.
3. An auxiliary drain pan without a separate drain line shall be installed under the coils on which condensation will occur. This pan shall be equipped with a water level detection device conforming to UL 508 that will shut off the equipment served prior to overflow of the pan. The pan shall be equipped with a fitting to allow for drainage. The auxiliary drain pan shall be constructed in accordance with Item 1 of this section.
4. A water level detection device conforming to UL 508 shall be installed that will shut off the equipment served in the event that the primary drain is blocked. The device shall be installed in the primary drain line, the overflow drain line or the equipment supplied drain pan, located at a point higher than the primary drain line connection and below the overflow rim of such pan.

(CHAPTER 15 EXHAUST SYSTEMS)

(SECTION M1502 CLOTHES DRYER EXHAUST)

M1502.4.1 Material and size. Exhaust ducts shall have a smooth interior finish and be constructed of metal having a minimum thickness of 0.0157 inches (0.3950 mm). The duct shall be 4 inches (102 mm) nominal in diameter.

M1502.4.2 Duct installation. Exhaust ducts shall be supported at each joint, 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. Ducts shall not be joined with fasteners that protrude more than 1/8 inch (3.2 mm) into the inside of the duct.

(SECTION M1503 RANGE HOODS)

M1503.4 Make-up air required. Exhaust hood system capable of exhausting in excess of 400 cubic feet per minute shall be provided with makeup air at a rate approximately equal to the exhaust air rate. Such makeup air systems shall be equipped with a means of closure and shall be automatically controlled to start and operate simultaneously with the exhaust system.

(CHAPTER 16 DUCT SYSTEMS)

(SECTION M1601 DUCT CONSTRUCTION)

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, as produced by the manufacturer and prior to use in the field, in accordance with UL 181 and installed in accordance with the manufacturer's instructions.,
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 or by Table M1601.1.1. Galvanized steel shall conform to ASTM A 653.
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. Stud wall cavities shall be sealed at the floor to not draft air from the living space between the flooring and drywall.
- 7.4. Stud wall cavities and joist-space plenums shall be isolated from adjacent concealed spaces by tight-fitting fireblocking in accordance with Section R602.8.
- 7.5. Stud wall cavities in the outside walls of building envelope assemblies shall not be utilized as air plenums.

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 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 inaccessible, 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.

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, 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.
3. 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.
4. Return air from one dwelling unit shall not be discharged into another dwelling unit.

5. Return air may be taken from a bedroom closet over 64 square feet in area.

(CHAPTER 24 FUEL GAS)

(SECTION G2408 INSTALLATION)

G2408.4 Clearance from grade. 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 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.

(SECTION G2409 CLEARANCE REDUCTION)

G2409.1 (308.1) Scope. This section shall govern the reduction in required clearances to combustibles materials, including gypsum board, and combustibles 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.

Exception: Where allowed by the Manufacturer's Installation Instructions and approved by the Building Official.

(SECTION G2412 GENERAL)

G2412.9 (401.9) Identification. Each length of pipe and tubing, as produced by the manufacturer and prior to use in the field, shall bear the identification of the manufacturer. Each pipe fitting utilized in a fuel gas system shall bear the identification of the manufacturer.

(SECTION G2439 CLOTHES DRYER EXHAUST)

G2439.7.4.1 (614.8.4.1) Specified length. 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.

(SECTION G2442 FORCED-AIR WARM-AIR FURNACES)

G2442.4 (618.4) Prohibited sources. 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 defined 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 Section 2442.2, 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. Return air may be taken from a bedroom closet over 64 square feet in area.
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.

(CHAPTER 25 PLUMBING ADMINISTRATION)

(SECTION P2503 INSPECTION AND TESTS)

P2503.5.1 Rough plumbing. DWV systems shall be tested on completion of the rough piping installation by water or by air without evidence of leakage. Either test shall be applied to the drainage system in its entirety or in sections after rough-in piping has been installed, as follows:

1. Water test. Each section shall be filled with water to a point not less than 5 feet (1524 mm) above the highest fitting connection in that section, or to the highest point in the completed system. Water shall be held in the section under test for a period of 15 minutes. The system shall prove leak free by visual inspection.
2. Air test. The portion under test shall be maintained at a gauge pressure of 5 pounds per square inch (psi) (34 kPa) or 10 inches of mercury column (34 kPa). This pressure shall be held without introduction of additional air for a period of 15 minutes.

P2503.6 Shower liner test. Delete this section in its entirety.

(CHAPTER 26 GENERAL PLUMBING REQUIREMENTS)

(SECTION P2603 STRUCTURAL AND PIPING PROTECTION)

P2603.5.1 Sewer depth. Building sewers that connect to private sewage disposal systems shall be a minimum of 18 inches (453 mm) below finished grade at the point of septic tank connection. Building sewers shall be a minimum of 30 inches (762 mm) below grade.

(SECTION P2604 TRENCHING AND BACKFILLING)

P2604.90 Tracer wire or other utility location technology. Tracer wire or other utility location technology shall be installed as required by RSMo 319.033 and the local utility.

(SECTION P2609 MATERIALS EVALUATION AND LISTING)

P2609.1 Identification. Each length of pipe and tubing, as produced by the manufacturer and prior to use in the field, shall bear the identification of the manufacturer. Each pipe fitting utilized in a plumbing system shall bear the identification of the manufacturer.

(CHAPTER 28 WATER HEATERS)

(SECTION P2108 GENERAL)

P2801.8 Water heater seismic bracing. In Seismic Design Categories D0, D1 and D2, 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.

(CHAPTER 29 WATER SUPPLY AND DISTRIBUTION)

(SECTION P2903 WATER SUPPLY SYSTEM)

P2903.5 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water-hammer arrestor shall be installed where quick-closing valves are used. Water-hammer arrestors shall be installed in accordance with the manufacturer's installation instructions. Water-hammer arrestors shall conform to ASSE 1010.

(SECTION P2904 DWELLING UNIT FIRE SPRINKLER SYSTEMS)

P2904.1 General. When installed, the design and installation of residential fire sprinkler systems shall be in accordance with NFPA 13D or Section 2904, which shall be considered equivalent to NFPA 13D. Partial residential sprinkler systems shall be permitted to be installed only in buildings not required to be equipped with a residential sprinkler system. Section P2904 shall apply to stand-alone and multipurpose wet-pipe sprinkler systems that do not include the use of antifreeze. A multipurpose fire sprinkler system shall provide domestic water to both fire sprinklers and plumbing fixtures. A stand-alone sprinkler system shall be separate and independent from the water distribution system. A backflow preventer shall not be required to separate a standalone system from the water distribution system.

(CHAPTER 30 SANITARY DRAINAGE)

(SECTION P3002 MATERIALS)

P3002.2 Building sewer. Building sewer piping shall be as shown in Table P3002.2. All sewer laterals will be polyvinyl chloride schedule 40 or equivalent as determined by the City of O'Fallon. Forced main sewer piping shall conform to one of the standards for ABS plastic pipe, copper, or copper-alloy tubing, PVC plastic pipe or pressure rated pipe indicated in Table P3002.2.

(CHAPTER 31 VENTS)

(SECTION P3103 VENT TERMINALS)

P3103.1 Roof extension. Open vent pipes that extend through a roof shall be terminated not less than 12 inches (152 mm) above the roof or 6 inches (152 mm) above the anticipated snow accumulation, whichever is greater. Where a roof is to be used for assembly, as a promenade, observation deck or sunbathing deck or for similar purposes, open vent pipes shall terminate not less than 7 feet (2134 mm) above the roof.

(SECTION P3201 FIXTURE TRAPS)

R3201.2.1 Trap seal protection. 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 deep trap seal used as a condensate drain.

(CHAPTER 39 POWER AND LIGHTING DISTRIBUTION)

(SECTION E3902 GROUND-FAULT AND ARC-FAULT CIRCUIT INTERRUPTER PROTECTION)

E3902.2 Garage and accessory building receptacles. 125-volt, single-phase, 15- or 20-ampere receptacles installed in garage and grade-level portions of unfinished accessory buildings used for storage or work areas shall have ground-fault circuit-interrupter protection for personnel.
[210.8(A)(2)]

Exception: Fastened in place garage door openers.

E3902.5 Unfinished basement receptacles. 125-volt, single-phase, 15- and 20-ampere receptacles installed in unfinished basements shall have ground-fault circuit-interrupter protection for personnel. For purposes of this section, unfinished basements are defined as portions or areas of the basement not intended as habitable rooms and limited to storage areas, work areas, and similar areas. [210.8(A)(5)]

Exceptions:

1. A receptacle supplying only a permanently installed fire alarm or burglar alarm system. Receptacles installed in accordance with this exception shall not be considered as meeting the requirements of Section E3901.9.
2. Where a simplex receptacles is installed to serve an installed sump pump.

E3902.16 Arc-fault circuit-interrupter protection. 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 of 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 first 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)]
5. Where metal outlet boxes and junction boxes and RMC, IMC, EMT, Type MC or steel-armored Types AC cables meeting the requirements of Section E3908.8, metal wireways or metal auxiliary gutters 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)]
6. 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 is not required for an individual branch circuit supplying only a fire alarm system where the branch circuit is wired with metal outlet and junction boxes and RMC, IMC, EMT or steel-sheathed armored cable Type AC or Type MC meeting the requirements of Section E3908.8.

E3902.17 Arc-fault circuit interrupter protection for branch circuit extensions or modifications. Where branch-circuit wiring is modified, replaced, or extended in any of the areas specified in Section E3902.16, 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 conductors is not more than 30 feet (9.5 m) in length and does not include any additional outlets or devices. [210.12(B) exception]

(APPENDIX E MANUFACTURED HOUSING USED AS DWELLINGS)

(SECTION AE101 SCOPE)

AE101.1 General. These provisions shall be applicable only to a manufactured home used as a single dwelling unit installed on any lot and shall apply to the following:

1. Construction, alteration and repair of any foundation system that is necessary to provide for the installation of a manufactured home unit.
2. Construction, installation, addition, alteration, repair or maintenance of the building service equipment that is necessary for connecting manufactured homes to water, fuel, or power supplies and sewage systems.
3. Alterations, additions or repairs to existing manufactured homes. The construction, alteration, moving, demolition, repair and use of

accessory buildings and structures, and their building service equipment, shall comply with the requirements of the codes adopted by this jurisdiction. These provisions shall not be applicable to the design and construction of manufactured homes and shall not be deemed to authorize either modifications or additions to manufactured homes where otherwise prohibited.

Exception:

In addition to these provisions, new and replacement manufactured homes to be located in flood hazard areas as established in Table R301.2(1) of the International Residential Code shall meet the applicable requirements of Section R322 of the International Residential Code.

(SECTION AE304 FEES)

AE304.1 Fees. Fees shall be per section 500.470 of the City of O'Fallon, Municipal Code.

AE304.2 Plan review fees. Delete in its entirety.

AE304.3 Other provisions. Delete in its entirety.

AE304.3.1 Expiration of plan review. Delete in its entirety.

AE304.3.2 Investigation fees-work without a permit. Delete in its entirety.

AE304.3.2.1 Investigation. Delete in its entirety.

AE304.3.2.2 Fee. Delete in its entirety.

AE304.3.3 Fee refunds. Delete in its entirety.

AE304.3.3.1 Permit fee erroneously paid or collected. Delete in its entirety.

AE304.3.3.2 Permit fee paid when no work done. Delete in its entirety.

AE304.3.3.3 Plan review fee. Delete in its entirety.
