COMMUNITY DEVELOPMENT & NEIGHBORHOOD SERVICES
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2018 IRC AMENDMENTS

Adopted: January 12th, 2019

ORDINANCE NO. 151, 2018
OF THE COUNCIL OF THE CITY OF FORT COLLINS
AMENDING CHAPTER 5, ARTICLE II, DIVISION 2, OF THE CODE
OF THE CITY OF FORT COLLINS FOR THE PURPOSE OF REPEALING
THE *2015 INTERNATIONAL RESIDENTIAL CODE* AND ADOPTING THE
2018 INTERNATIONAL RESIDENTIAL CODE, WITH AMENDMENTS

WHEREAS, since 1924, the City has reviewed, amended and adopted the latest nationally recognized building standards available for the times; and

WHEREAS, upon recommendation of City staff, the City Council has determined that it is in the best interests of the City to align seven interconnected basic construction codes under one publication year; and

WHEREAS, the seven interconnected basic construction codes are the *International Building Code, International Residential Code, International Mechanical Code, International Fuel Gas Code, International Energy Conservation Code, and International Property Maintenance Code*; and

WHEREAS, the City Council has determined that the 2018 publication year of the seven interconnected basic construction codes ought to be adopted and that any counterpart codes previously adopted should be repealed, both in order to align the publication years of the codes and also because the 2018 publications contain improvements in construction code regulation; and

WHEREAS, City staff has conducted a significant public outreach program, working with the regulated construction industry and building professionals; and

WHEREAS, the adoption of the seven interconnected basic construction codes has been presented to and recommended by the Board of Realtors, Water Board, Energy Board, Commission on Disability, Natural Resource Advisory Board, Poudre Fire Authority Board, Building Review Board, Affordable Housing Board, Air Quality Advisory Board, Northern Colorado Home Builder Association and the Chamber of Commerce; and

WHEREAS, the City Council has determined that it is in the best interest of the health, safety and welfare of the City and its citizens that the *2015 International Residential Code*, as previously adopted and amended by the City pursuant to Ordinance No. 072, 2017, be repealed and that in its place, the *2018 International Residential Code* be adopted, with local amendments as set forth in this Ordinance; and

WHEREAS, pursuant to the City Charter II, Section 7, City Council may enact any ordinance which adopts a code by reference in whole or in part provided that before adoption of such ordinance the Council hold a public hearing thereon and that notice of the hearing is published twice in a newspaper of general circulation published in the City, with one of such publications occurring at least eight (8) days preceding the hearing and the other publication occurring at least fifteen (15) days preceding the hearing; and

WHEREAS, in compliance with Article II, Section 7, the City Clerk published in the Fort Collins *Coloradoan* such notice of hearing concerning adoption of the 2018 International Building Code on November 18, 2018, and November 25, 2018; and

WHEREAS, attached as Exhibit "A" and incorporated herein by reference is the Notice of Public Hearing dated November 18, 2018, that was so published and which the Council hereby finds meets the requirements of Article II, Section 7 of the City Charter.

Section 1. That the City Council hereby makes and adopts the determinations and findings contained in the recitals set forth above.

Section 2. That Section 5-26(d) of the Code of the City of Fort Collins is hereby amended to read as follows:

(d) Pursuant to the power and authority conferred on the City Council by Section 31-16-202, C.R.S., and Article II, Section 7 of the Charter, the City Council hereby repeals the ~~2015~~ Edition of the *International Residential Code*~~,~~ and adopts, as the residential building code of the City, the *2018 International Residential Code* published by the International Code Council, as amended by the City, which shall have the same force and effect as though set forth in full herein. The subject matter of the *International Residential Code* adopted herein includes comprehensive provisions and standards for the protection of the public health and safety by prescribing regulations governing the construction, alteration, enlargement, relocation, replacement, repair, equipment, use and occupancy, location, removal and demolition of, and its applicability is hereby limited to, individual nonattached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three (3) stories above grade in height with a separate means of egress, and their accessory structures. As provided in the *2018 International Residential Code*, Appendices are not adopted except as expressly set forth in Section 5-30.

Section 3. That Section 5-30 of the Code of the City of Fort Collins is hereby repealed and reenacted to read as follows:

Sec. 5-30 Amendments and deletions to code.

The *2018 INTERNATIONAL RESIDENTIAL CODE* adopted herein is hereby amended in the following respects:

(1) ***Section R101.1 Title,*** is hereby retained in its entirety with the following amendments:

R101.1 Title. These provisions shall be known as the Residential Code for One- and Two-family Dwellings of the City of Fort Collins and shall be cited as such and will be referred to herein as "this code."

(2) ***Section R102.4 Referenced codes and standards,*** is hereby retained in its entirety with the following amendments:

R102.4 Referenced codes and standards. The codes and standards referenced in this code shall be those that are listed in Section 101.4, entitled 'Referenced Codes' of the adopted *International Building Code* and shall be considered part of the requirements of this code to the prescribed extent of each such reference and as further regulated in Sections R102.4.1 and R102.4.2.

Exception: Where enforcement of a code provision would violate the conditions of the listing of the equipment or appliance, the conditions of the listing and manufacturer's instructions shall apply.

(3) ***Section R103 Department of Building Safety,*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**SECTION R103**~~
~~**DEPARTMENT OF BUILDING SAFETY**~~

~~**R103.1 Creation of enforcement agency.** The department of building safety is hereby created and the official in charge thereof shall be known as the *building official.*~~
~~**R103.2 Appointment.** The *building official* shall be appointed by the jurisdiction.~~
~~**R103.3 Deputies.** In accordance with the prescribed procedures of this jurisdiction and with the concurrence of the appointing authority, the *building official* shall have the authority to appoint a deputy building official, the related technical officers, inspectors, plan examiners and other employees. Such employees shall have powers as delegated by the *building official.*~~

R103 Code Administration.

R103.1 Entity charged with code administration shall be as determined in accordance with Section 103, entitled 'Code Administration' of the adopted *International Building Code.*

(4) ***Section R105.2 Work exempt from permit,*** is hereby retained in its entirety with the following amendments:

. . .

Building:

1. One-story, detached, *accessory structures* for lawn and garden equipment storage, tool storage and similar uses, as well as arbors, pergolas, and similar structures, provided the floor area does not exceed ~~200 square feet (18.58 m2)~~ 120 square feet (11.15 m^2) or 8 feet (2.438 m) in height, do not house flammable liquids in quantities exceeding 10 gallons (38 l) per building and are located at least 3 feet (0.914 m) from an adjoining property line.

2. Fences not over ~~7 feet (2134 mm)~~ 6 feet (1829 mm) high.

3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the ~~bottom of the footing~~ low side *grade* to the top of the wall, provided the horizontal distance to the next uphill retaining wall is at least equal to the total height of the lower retaining wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.

4. Water tanks supported directly upon grade if the capacity does not exceed 5,000 gallons (18,927 L) and the ratio of height to diameter or width does not exceed 2 to 1.

~~5. Sidewalks and driveways.~~

5. Platforms intended for human occupancy or walking, sidewalks and driveways not more than 30 inches (762 mm) above adjacent *grade*, and are not part of an accessible route.

6. Painting, papering, tiling, carpeting, cabinets, counter tops and similar finish work.

7. Prefabricated and portable swimming ~~pools that are less than 24 inches (610 mm) deep.~~ or wading pools, hot tubs or spas supported directly upon *grade* when the walls are entirely above *grade* and which cannot contain water more than 24 inches (610 mm) deep.

8. Swings and other playground equipment, or play house/structure not exceeding 120 square feet. One elevated play house or play structure per lot designed and used exclusively for play. Elevated play houses or play structures shall not exceed 64 square feet (5.9 m2) of floor area nor 6 feet (1.82 m) in height measured from the floor to the highest point of such structure.

9. Window awnings supported by an exterior wall ~~that~~ which do not project more than 54 inches (1372 mm) from the exterior wall and do not require additional support and do not extend over the public right of way. Window replacement requiring no structural *alteration* or no change in the window configuration which reduces the clear opening, storm window, storm door and rain gutter installation, except that structures that are fifty years of age or older must undergo a historic review pursuant to City Code Chapter 14.

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

11. Roofing repair or replacement work not exceeding one square (100 square feet) of covering per building.

12. Replacement of nonstructural *siding*, when removal of *siding* is performed in accordance with State laws regarding asbestos and lead paint, except that structures

that are fifty years of age or older must undergo a historic review pursuant to City Code Chapter 14.

13. Work valued at less than $500 when such work does not involve *alteration* of structural components, fire-rated assemblies, plumbing, electrical, mechanical or fire-extinguishing systems.

14. Decorative ponds, fountains and pools that cannot contain water more than 24 inches (610 mm) deep.

15. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems. Hoop houses constructed with a flexible frame such as PVC tubing used for starting plants.

~~**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.~~

(5) ***Section R105.3.2 Time limitation of application***, is hereby retained in its entirety with the following amendments:

R105.3.2 Time limitation of application An application for a permit for any proposed work shall be deemed to have been abandoned 180 days after the date of filing, unless such application has been pursued in good faith or a permit has been issued; except that the building official is authorized to grant one or more extensions of time for additional periods not exceeding 180 days each provided the application has not expired. The extension shall be requested in writing and justifiable cause demonstrated. Applications that have expired for 30 days or more will be considered void.

(6) ***Section R105.5 Expiration***, is hereby retained in its entirety with the following amendments:

Section R105.5 Expiration. Every *permit* issued shall become invalid unless the work authorized by such *permit* is commenced within 180 days after its issuance or after commencement of work if more than 180 days pass between inspections. The *building official* is authorized to grant, in writing, one or more extensions of time, for periods not more than 180 days each. The extension shall be requested in writing and justifiable cause demonstrated.

Both prior to and subsequent to the effective date of this code, any work authorized by a permit regulated by this code or any other building construction code administered by the *building official* that involves the construction or *alteration* of an exterior building component, assembly or finish material, such as the foundation, wall and roof framing, sheathing, siding, fenestration, and roof covering, shall be fully finished and completed for permanent outdoor exposure within 24 months of date of this issuance of such permit.

(7) A new ***Section R105.10 Premises identification,*** is hereby added to read as follows:

R105.10 Premises identification during construction. The *approved* permit number and street address number shall be displayed and be plainly visible and legible from the public street or road fronting the property on which any new building is being constructed.

(8) A new ***Section R105.11 Transfer of permits,*** is hereby added to read as follows:

R105.11 Transfer of permits. A current valid building permit may be transferred from one party to another upon written application to the *building official* showing both parties consent to the transfer. When any changes are made to the original plans and specifications that substantially differ from the plans submitted with the permit, as determined by the *building official*, a new plan review fee shall be paid as calculated in accordance with Section R108. A fee of $50 shall be paid to cover administrative costs for all building permit transfers. No change shall be made in the expiration date of the original permit.

(9) ***Section R106.1.4 Information for construction in flood hazard areas,*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**R106.1.4 Information for construction in flood hazard areas.** For buildings and structures located in whole or in part in flood hazard areas as established by Table R301.2(1), *construction documents* shall include:~~

~~1. Delineation of flood hazard areas, floodway boundaries and flood zones and the design flood elevation, as appropriate;~~

~~2. The elevation of the proposed lowest floor, including *basement*; in areas of shallow flooding (AO Zones), the height of the proposed lowest floor, including *basement*, above the highest adjacent *grade*;~~

~~3. The elevation of the bottom of the lowest horizontal structural member in coastal high-hazard areas (V Zone) and in Coastal A Zones where such zones are delineated on flood hazard maps identified in Table R301.2(1) or otherwise delineated by the jurisdiction.~~

~~4. If design flood elevations are not included on the community's Flood Insurance Rate Map (FIRM), the *building official* and the applicant shall obtain and reasonably utilize any design flood elevation and floodway data available from other sources.~~

R106.1.4 Information for construction in flood hazard areas. For buildings or structures regulated under the scope of this code that are in whole or in part located in flood hazard areas, *construction documents* shall be submitted as established in accordance with the City Code, Chapter 10, entitled 'Flood Prevention and Protection'.

(10) **A new *Section R106.1.5 Grading performance plans and certificate***, is hereby added to read as follows:

R106.1.5 Grading performance plans and certificate. Every building permit application for a new building regulated by this code shall be accompanied by a site drainage/grading performance plan as prescribed by City standards. Drainage plans shall be submitted to and approved by the City's Storm Drainage department prior to the issuance of the permit.

(11) ***Section R106.3.1 Approval of construction documents***, is hereby retained in its entirety with the following amendments:

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

(12) ***Section R107, Temporary Structures and Uses***, is deleted in its entirety.

~~**SECTION R107**~~
~~**TEMPORARY STRUCTURES AND USES**~~

~~**R107.1 General.** The building official is authorized to issue a permit for temporary structures and temporary uses. Such permits shall be limited as to time of service, but shall not be permitted for more than 180 days. The building official is authorized to grant extensions for demonstrated cause.~~

~~**R107.2 Conformance.** Temporary structures and uses shall conform to the structural strength, fire safety, means of egress, light, ventilation and sanitary requirements of this code as necessary to ensure the public health, safety and general welfare.~~

~~**R107.3 Temporary power.** The building official is authorized to give permission to temporarily supply and use power in part of an electric installation before such installation has been fully completed and the final certificate of completion has been issued. The part covered by the temporary certificate shall comply with the requirements specified for temporary lighting, heat or power in NFPA 70.~~

~~**R107.4 Termination of approval.** The building official is authorized to terminate such permit for a temporary structure or use and to order the temporary structure or use to be discontinued.~~

(13) ***Section R108, Fees***, is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**SECTION R108 FEES**~~

~~**R108.1 Payment of fees.** A *permit* shall not be valid until the fees prescribed by law have been paid, nor shall an amendment to a *permit* be released until the additional fee, if any, has been paid.~~

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

~~**R108.3 Building permit valuations.** Building *permit* valuation shall include total value of the work for which a *permit* is being issued, such as electrical, gas, mechanical, plumbing equipment and other permanent systems, including materials and labor.~~

~~**R108.4 Related fees.** The payment of the fee for the construction, alteration, removal or demolition for work done in connection with or concurrently with the work authorized by a building *permit* shall not relieve the applicant or holder of the *permit* from the payment of other fees that are prescribed by law.~~

~~**R108.5 Refunds.** The *building official* is authorized to establish a refund policy.~~

~~**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.~~

R108 Fees

R108.1 Payment of fees. No permit shall be valid until the fees prescribed by the City Manager pursuant to Chapter 7.5, Article I of the City Code, entitled, 'Administrative Fees', have been paid, except emergency permits issued pursuant to Section 105.2.1 of the *International Building Code*.

(14) A new ***Section R109.1.7 Site Survey required,*** is hereby added to read as follows:

R109.1.7 Site survey required. A survey or improvement location certificate of the site on which a new building or addition is to be constructed may be required by the *building official* to verify that the structure is located in accordance with the *approved* plans and any other regulations of the City.

(15) A new ***Section R110.2 Change in use,*** is hereby amended to read as follows:

R110.2 Change in use. Changes in the character, ~~or~~ use, or occupancy of an existing structure shall not be made except ~~as specified in Sections 407 and 408 of the *International Building Code*~~ when approved by the *building official* and the structure is in conformance with this code and the *International Building Code,* as amended by the City.

(16) ***Section R112, Board of Appeals***, is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**SECTION R112 BOARD OF APPEALS**~~

~~**R112.1 General.** In order to hear and decide appeals of orders, decisions or determinations made by the *building official* relative to the application and interpretation of this code, there shall be and is hereby created a board of appeals. The *building official* shall be an ex officio member of said board but shall have no vote on any matter before the board. The board of appeals shall be appointed by the governing body and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business, and shall render all decisions and findings in writing to the appellant with a duplicate copy to the *building official*.~~

~~**R112.2 Limitations on authority.** An application for appeal shall be based on a claim that the true intent of this code or the rules legally adopted thereunder have been incorrectly interpreted, the provisions of this code do not fully apply, or an equally good or better form of construction is proposed. The board shall have no authority to waive requirements of this code.~~

~~**R112.3 Qualifications.** The board of appeals shall consist of members who are qualified by experience and training to pass judgement on matters pertaining to building construction and are not employees of the *jurisdiction*.~~

~~**R112.4 Administration.** The *building official* shall take immediate action in accordance with the decision of the board.~~

R112 Board of Appeals

R112.1 General. Appeals of decisions, determinations and interpretations of this code shall be made pursuant to applicable provisions as set forth in Section 113, entitled 'Board of Appeals' of the *International Building Code,* as amended by the City.

(17) ***Section R113.4 Violation penalties,*** is hereby retained in its entirety with the following amendments:

R113.4 Violation penalties. Any person who violates a provision of this code or fails to comply with any of the requirements thereof or who erects, constructs, alters or repairs a building or structure in violation of the approved construction documents or directive of the building official, or of a permit or certificate issued under the provisions of this code, ~~shall be subject to penalties as prescribed by law.~~ shall be guilty of a misdemeanor subject

to the penalties and fines pursuant to Section 1-15 of the City Code, except violations of Section R328 of the *International Residential Code* will be a civil infraction subject to the penalty provisions of Section 1-15(f) of the City Code. Each day that a violation continues shall be deemed a separate offense.

(18) A new ***Section R113.5 Work commencing before permit issuance,*** is hereby added to read as follows:

R113.5 Work commencing before permit issuance. In addition to penalties set forth in R113.4, any person or firm who, before obtaining the necessary permit(s), commences any construction of, or work on, a building, structure, electrical, gas, mechanical or plumbing system that is not otherwise exempted from obtaining a permit, shall be subject to a processing and penalty fee in addition to the standard prescribed permit fee. Such additional fee shall be equal to the permit fee, except that such fee shall not be less than $50 nor more than $1,000 for the first such violation. A person or firm committing such violation repeatedly is subject to processing and penalty fees equal to double the amount of the permit fee or double the amount of the preceding violation, whichever is greater, for every same such subsequent violation committed thereafter within any 180-day period. The foregoing fees may be appealed to the City Manager pursuant to Chapter 2, Article VI of the City Code.

(19) ***Section R202 Definitions***, is hereby amended to delete, modify, or add, in alphabetical order, the following definitions:

...

BASEMENT. ~~A *story* that is not a *story above grade plane*. (see "*Story above grade plane*").~~ That portion of a building located partly or completely below *grade*, wherein the underside of the floor system immediately above is 72 inches (1829 mm) or more above the surface of an *approved* permanent *basement* floor system.

...

CITY. The municipal corporation of Fort Collins, Colorado, including its physical location and boundaries.

...

CRAWLSPACE. That portion of a building that is conditioned or non-conditioned space located partly or completely below *grade* (excluding the under-floor space beneath below-grade structural floor systems), wherein the underside of the adjacent finished floor above is less than 72 inches (1829 mm) above the bottom surface of such crawlspace.

...

DWELLING. ~~Any building that contains one or two *dwelling units* used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes.~~ Shall mean a building used exclusively for residential occupancy and for permitted accessory uses, including single-family dwellings, two-family *dwellings* and multi-family *dwellings*. The term *dwelling* shall not include hotels, motels,

homeless shelters, seasonal overflow shelters tents or other structures designed or used primarily for temporary occupancy. Any *dwelling* shall be deemed to be a principal building.

DWELLING UNIT. ~~A single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.~~ Shall mean one or more rooms and a single *kitchen* and at least 1 bathroom, designed, occupied or intended for occupancy as separate quarters for the exclusive use of a single family for living, cooking and sanitary purposes, located in a single-family, two-family or multi-family dwelling or mixed-use building.

...

FAMILY shall mean any individual living alone or any number of persons who are all related by blood, marriage, adoption, guardianship or other duly authorized custodial relationship, and who live together as a single housekeeping unit and share common living, sleeping, cooking and eating facilities.

...

FLOOR AREA. The area included within the surrounding *exterior walls* of a building or portion thereof, exclusive of *vent* shafts and *courts*. The floor area of a building, or portion thereof, not provided with surrounding *exterior walls* shall be the usable area under the horizontal projection of the roof or floor above.

...

GRADE ~~The finished ground level adjoining the building at all *exterior walls.*~~ (ADJACENT GROUND ELEVATION). The lowest point of elevation of the finished surface of the ground, paving or sidewalk, deck or platform with the area between the building and the property line or, when the property line is more than 5 feet (1.524 m) from the building, between the building and a line 5 feet (1.524 m) from the building.

...

ROOM, SLEEPING (BEDROOM). A *habitable space* within a *dwelling* or other housing unit designed primarily for the purpose of sleeping. The presence of a bed, cot, mattress, convertible sofa or other similar furnishing used for sleeping purposes is indicia for determining that such space or room qualifies as a sleeping room. The presence of *closets* and similar storage facilities is not considered a relevant factor in determining whether or not a room is a sleeping room.

...

SITE. A parcel of land bounded by a property line or a designated portion of a public right-of-way.

...

TOWNHOUSE: A single-family dwelling unit constructed in a group of ~~three~~ two or more attached individual units ~~in which each unit extends from foundation to roof and with a~~

~~*yard* or public way on at least two sides.~~, each of which is separated from the other from the foundation to the roof and is located entirely on a separately recorded and platted parcel of land (site) bounded by property lines that is deeded exclusively for such single-family dwelling.

...

(20) ***Section 301.1.3 Engineered design,*** is hereby retained in its entirety with the following amendments:

R301.1.3 Engineered design. When a building of otherwise conventional light-frame construction contains structural elements ~~exceeding the limits of Section R301 or otherwise~~ not conforming to this code, these elements shall be designed in accordance with accepted engineering practice. The extent of such design need only demonstrate compliance of nonconventional elements with other applicable provisions and shall be compatible with the performance of the conventional framed system. Engineered design, in accordance with the *International Building Code*, as amended by the City, is permitted for all buildings, structures, and ~~parts~~ portions thereof~~,~~ included in the scope of this code.

(21) ***Section R301.2, Climatic and geographic design criteria*** and Table R301.2(1) CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA are hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**Climate and geographic design criteria.** Buildings shall be constructed in accordance with the provisions of this code as limited by the provisions of this section. Additional criteria shall be established by the local jurisdiction and set forth in Table R03.2(1).~~

~~TABLE 301.2(1)~~

~~CLIMATIC AND GEOGRAPHIC DESIGN CRITERIA~~

~~GROUND SNOW LOAD~~	~~W~~					~~SEISMIC DESIGN~~	~~SUBJECT TO~~			~~WIND DE~~	~~ICE BARRIER UNDERLAYMENT~~	~~FLOOD HAZA~~	~~AIR FREEZING INDEX~~	~~MEAN ANNUAL~~
	~~Speed~~	~~Topographic~~	~~Special wind~~	~~Windborne~~			~~Weathering~~	~~Frost line~~	~~Termite~~					
—	—	—	—	—		—	—	—	—	—	—	—	—	—

	~~M~~							
~~Elevation~~	~~Latitude~~		~~Winter~~	~~Sum~~	~~Altitude~~	~~Indoor design~~	~~Design~~	~~Heating temp~~
—	—		—	—	—	—	—	—
~~Cooling temperature difference~~	~~Wind velocity heating~~		~~Wind velocity~~	~~Coincide~~	~~Dai~~	~~Winter hum~~	~~Sum~~	—
—	—		—	—	—	—	—	—

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

~~a. Where weathering requires a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code, the frost line depth strength required for weathering shall govern. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(4). The grade of masonry units shall be determined from ASTM C34, C55, C62, C73, C90, C129, C145, C216 or C652.~~

~~b. 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(5)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 97½ 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. [Also see Figure R301.2(1).]~~

~~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(5)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 the jurisdiction shall indicate the wind-borne debris wind zone(s). Otherwise, the jurisdiction shall indicate "NO" in this part of the table.~~

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

~~o. The jurisdiction shall fill in this section of the table using the Ground Snow Loads in Figure R301.2(6). \\~~

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

GROUND SNOW LOAD[a]	WIND DESIGN				SEISMIC DESIGN CATEGORY[f]	SUBJECT TO DAMAGE FROM			WINTER DESIGN TEMP[e]	ICE BARRIER UNDERLAYMENT REQUIRED[h]	FLOOD HAZARDS[g]	AIR FREEZING INDEX[i]	MEAN ANNUAL TEMP[j]
	Speed[d,p] (mph)	Topographic effects[k]	Special wind region[l]	Windborne debris zone[m]		Weathering[a]	Frost line depth[b]	Termite[c]					
30psf	140	No	Yes	No	B	Severe	30 inches	Slight to moderate	6°F (-14°C)	Yes	July 16, 1979	906	48.4

MANUAL J DESIGN CRITERIA[q]							
Elevation	Latitude	Winter heating	Summer cooling	Altitude correction factor	Indoor design temperature	Design temperature cooling	Heating temperature difference
4987	40.5853	6	90	0.832	72	75	66
Cooling temperature difference	Wind velocity heating	Wind velocity cooling	Coincident wet bulb	Daily range	Winter humidity	Summer humidity	Summer indoor/outdoor wet bulb
15	15	7.5	62	High	30	50	62

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

a. Where weathering requires a higher strength concrete or grade of masonry than necessary to satisfy the structural requirements of this code, the frost line depth strength required for weathering shall govern. The weathering column shall be filled in with the weathering index, "negligible," "moderate" or "severe" for concrete as determined from Figure R301.2(4). The grade of masonry units shall be determined from ASTM C34, C55, C62, C73, C90, C129, C145, C216 or C652.

b. Where the frost line depth requires deeper footings than indicated in Figure R403.1(1), the frost line depth strength required for weathering shall govern. The jurisdiction shall fill in the frost line depth column with 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(5)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 97½ 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. [Also see Figure R301.2(1).]

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(5)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 the jurisdiction shall indicate the wind-borne debris wind zone(s). Otherwise, the jurisdiction shall indicate "NO" in this part of the table.

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

o. The jurisdiction shall fill in this section of the table using the Ground Snow Loads in Figure R301.2(6).

p. Alternatively, the basic design wind speed, V, in mph, for the determination of wind speed may comply with Colorado Front Range Gust Map – ASCE-7-10 compatible, published by the Structural Engineers Association of Colorado (dated November 18, 2011).

(22) ***Section R302.2*** **Townhouses** is hereby retained in its entirety with the following amendments:

R302.2 *Townhouses shall be provided with a fire-suppression system in accordance with section P2904 of this code, NFPA 13D, or other approved equivalent sprinkler system.* Walls separating townhouse units shall be constructed in accordance with section R302.2.1 or R302.2.2.

(23) ***Section R302.2.3 Continuity*** is hereby retained in its entirety with the following amendments:

R302.2.3 Continuity. The fire-resistance-rated common wall or assembly separating *townhouses* along property lines shall be continuous from the foundation to the underside of the roof sheathing, deck or slab. The fire-resistance rating shall extend the full length of the wall or assembly, including wall extensions through and separating attached and/or enclosed *accessory structures* or spaces. The fire-resistance-rating shall be maintained within concealed spaces of projecting elements such as, roof overhangs, canopies, marquees and similar projections. The fire- resistant rated adjoining *walls* shall extend to the outer edge of horizontal projecting elements such as balconies which extend more than 24 inches beyond the *exterior wall.*

(24) ***Section R302.3 Two-family dwellings*** is hereby retained in its entirety with the following amendments:

R302.3 Two-family dwellings. Two-family dwellings shall be provided with a fire-suppression system as per P2904 at a minimum. *Dwelling units* in two-family dwellings shall be separated from each other by wall and/or floor assemblies having not less than a one-hour fire-resistance rating when tested in accordance with ASTME 119~~,~~ or UL 263 ~~or Section 703.3~~. Fire-resistance-rated floor~~/~~-ceiling and wall assemblies shall extend to and be tight against the exterior wall, and wall assemblies shall extend from the foundation to the underside of the roof sheathing.

Exceptions:

1. A fire-resistance rating of ½ hour shall be permitted in buildings equipped throughout with an automatic sprinkler system installed in accordance with NFPA 13.

2. Wall assemblies need not extend through attic spaces when the ceiling is protected by not less than 5/8-inch (15.9 mm) Type X gypsum board and an attic draft stop constructed as specified in Section R302.12.1 is provided above and along the wall assembly separating the dwellings. The structural framing supporting the ceiling shall also be protected by not less than 1/2-inch (12.7 mm) gypsum board or equivalent.

(25) ***Section R308.4.7 Glazing adjacent to the bottom stair landing*** is hereby retained in its entirety with the following amendments:

R308.4.7 Glazing adjacent to ~~the bottom~~ stair landings. Glazing adjacent to the stair landings ~~at the bottom of a stairway~~ where the glazing is less than 36 inches (914 mm) above the landing and within a 60 inch (1524 mm) horizontal arc less than 180 degrees ~~(3.14 rad) from the~~ of the top or bottom tread ~~nosing~~ shall be considered a hazardous location. ~~(See Figure R308.4.7.)~~

Exception: ~~Where t~~The glazing is protected by a *guard* complying with Section R312 and the plane of the glass is more than 18 inches (457 mm) from the *guard.*

. . .

(26) ***Section R310.1 Emergency escape and rescue opening required*** is hereby retained in its entirety with the following amendments:

R310.1 Emergency escape and rescue opening required *Basements*, *habitable attics*, habitable lofts and *mezzanines*, 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.

Exception:

1. Storm shelters and *basements* used only to house mechanical *equipment* not exceeding a total floor area of 200 square feet (18.58 m^2).
2. ~~Where the dwelling or townhouse is equipped with an automatic sprinkler system installed in accordance with section P2904, sleeping rooms in basements shall not be required to have emergency escape and rescue openings provided that the basement has one of the following:~~
    ~~2.1 One means of egress complying with Section R311 and one emergency escape and rescue opening.~~
    ~~2.2 Two means of egress complying with section R311.~~

(27) ***Section R310.1.1 Operational constraints and opening control devices*** is hereby retained in its entirety with the following amendments:

Section R310.1.1 Operational constraints and opening control devices. Emergency escape and rescue openings shall be operational from the inside of the room without the use of keys, tools or special knowledge. ~~Window opening control devices on windows serving as a required emergency escape and rescue opening shall comply with ASTM F2090.~~

(28) ***Section R310.2.2 Window sill height*** is hereby retained in its entirety with the following amendments:

R310.2.2 Window sill height Where a window is provided as the emergency escape and rescue opening, it shall have a sill height of not more than 44 inches (1118 mm) above the floor; where the sill height is below *grade*, it shall be provided with a window well in accordance with Section R310.2.3. Emergency escape and rescue window openings that are located more than 72 inches (1829 mm) above the finished *grade* shall have a sill height of not less than 24 inches (609 mm) measured from the finished interior side floor.

(29) ***Section R311.7.1 Width*** is hereby retained in its entirety with the following amendments:

R311.7.1 Width. Stairways shall be not less than 36 inches (914 mm) in clear width at all points above the permitted handrail height and below the required headroom height. The clear width of stairways at and below the handrail height, including treads and landings, shall be not less than 311/2 inches (787 mm) where a handrail is installed on one side and 27 inches (698 mm) where handrails are installed on both sides.

Exception: The width of spiral stairways installed as part of an individual *dwelling* unit shall be in accordance with Section R311.7.10.1.

(30) ***Section R311.7.5.1 Risers*** is hereby retained in its entirety with the following amendments:

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

Exceptions:

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

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

(31) ***Section R313.2 One- and two-family dwellings automatic fire systems*** is hereby retained in its entirety with the following amendments:

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

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

(32) ***Section R314.2.2 Alterations, repairs and additions***, is hereby retained in its entirety with the following amendments:

R314.2.2 Alterations, repairs and additions. Where alterations, repairs or additions requiring a permit occur, the individual *dwelling unit* shall be equipped with smoke alarms located as required for new *dwellings*

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, the addition or replacement of windows or doors, or the addition of a porch or deck.

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

(33) ***Section R314.4 Interconnection*** is hereby retained in its entirety with the following amendments:

R314.4 Interconnection. Where more than one smoke alarm is required to be installed within an individual dwelling unit in accordance with Section R314.3, the alarm devices shall be interconnected in such a manner that the actuation of one alarm will activate all of the alarms in the individual *dwelling unit*. Physical interconnection of smoke alarms shall not be required where listed wireless alarms are installed and all alarms sound upon activation of one alarm.

Exception: Interconnection of smoke alarms in existing areas shall not be required where alterations or repairs do not result in removal of interior wall or ceiling finishes exposing the structure, unless there is an attic, crawl space, or basement available to could provide access for interconnection without the removal if interior finishes.

(34) ***Section R315.2.2 Alterations, repairs and additions***, is hereby retained in its entirety with the following amendments:

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

Exceptions:

1. Work involving the exterior surfaces of dwellings, such as the replacement of roofing or siding, or the addition or replacement of windows or doors, or the addition of a porch or deck.

~~2. Installation, *alteration* or repairs of plumbing or mechanical systems.~~

(35) ***Section R320.1 Scope,*** is hereby retained in its entirety with the following amendments:

R320.1 Scope. Where there are four or more dwelling units or sleeping units constructed in a single structure, the applicable provisions of Colorado Revised Statutes §9-5-101 *et. seq.*, and the provisions of Chapter 11 of the adopted *International Building Code* for Group R-3 shall apply. Nothing in this Section abrogates or otherwise affects an owner's

duties or responsibilities under the Americans with Disabilities Act or any other federal law or regulation regarding accessibility.

(36) ***Section R322 Flood-resistant construction*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**R322.1 General.**~~

~~Buildings and structures constructed in whole or in part in flood hazard areas, including A or V Zones and Coastal A Zones, as established in Table R301.2(1), and substantial improvement and repair of substantial damage of buildings and structures in flood hazard areas, shall be designed and constructed in accordance with the provisions contained in this section. Buildings and structures that are located in more than one flood hazard area shall comply with the provisions associated with the most restrictive flood hazard area. Buildings and structures located in whole or in part in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

~~**R322.1.1 Alternative provisions.**~~

~~As an alternative to the requirements in Section R322, ASCE 24 is permitted subject to the limitations of this code and the limitations therein.~~

~~**R322.1.2 Structural systems.**~~

~~Structural systems of buildings and structures shall be designed, connected and anchored to resist flotation, collapse or permanent lateral movement due to structural loads and stresses from flooding equal to the design flood elevation.~~

~~**R322.1.3 Flood-resistant construction.**~~

~~Buildings and structures erected in areas prone to flooding shall be constructed by methods and practices that minimize flood damage.~~

~~**R322.1.4 Establishing the design flood elevation.**~~

~~The design flood elevation shall be used to define flood hazard areas. At a minimum, the design flood elevation shall be the higher of the following:~~

~~1. The base flood elevation at the depth of peak elevation of flooding, including wave height, that has a 1 percent (100 year flood) or greater chance of being equaled or exceeded in any given year.~~

~~2. The elevation of the design flood associated with the area designated on a flood hazard map adopted by the community, or otherwise legally designated.~~

~~**R322.1.4.1 Determination of design flood elevations.**~~

~~If design flood elevations are not specified, the building official is authorized to require the applicant to comply with either of the following:~~

~~1. Obtain and reasonably use data available from a federal, state or other source.~~

~~2. Determine the design flood elevation in accordance with accepted hydrologic and~~

~~hydraulic engineering practices used to define special flood hazard areas. Determinations shall be undertaken by a registered design professional who shall document that the technical methods used reflect currently accepted engineering practice. Studies, analyses and computations shall be submitted in sufficient detail to allow thorough review and approval.~~

~~R322.1.4.2 Determination of impacts.~~

~~In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the effect of the proposed buildings and structures on design flood elevations, including fill, when combined with other existing and anticipated flood hazard area encroachments, will not increase the design flood elevation more than 1 foot (305 mm) at any point within the jurisdiction.~~

~~R322.1.5 Lowest floor.~~

~~The lowest floor shall be the lowest floor of the lowest enclosed area, including basement, and excluding any unfinished flood resistant enclosure that is useable solely for vehicle parking, building access or limited storage provided that such enclosure is not built so as to render the building or structure in violation of this section.~~

~~R322.1.6 Protection of mechanical, plumbing and electrical systems.~~

~~Electrical systems, equipment and components; heating, ventilating, air conditioning; plumbing appliances and plumbing fixtures; duct systems; and other service equipment shall be located at or above the elevation required in Section R322.2 or R322.3. If replaced as part of a substantial improvement, electrical systems, equipment and components; heating, ventilating, air conditioning and plumbing appliances and plumbing fixtures; duct systems; and other service equipment shall meet the requirements of this section. Systems, fixtures, and equipment and components shall not be mounted on or penetrate through walls intended to break away under flood loads.~~

~~Exception: Locating electrical systems, equipment and components; heating, ventilating, air conditioning; plumbing appliances and plumbing fixtures; duct systems; and other service equipment is permitted below the elevation required in Section R322.2 or R322.3 provided that they are designed and installed to prevent water from entering or accumulating within the components and to resist hydrostatic and hydrodynamic loads and stresses, including the effects of buoyancy, during the occurrence of flooding to the design flood elevation in accordance with ASCE 24. Electrical wiring systems are permitted to be located below the required elevation provided that they conform to the provisions of the electrical part of this code for wet locations.~~

~~R322.1.7 Protection of water supply and sanitary sewage systems.~~

~~New and replacement water supply systems shall be designed to minimize or eliminate infiltration of flood waters into the systems in accordance with the plumbing provisions of this code. New and replacement sanitary sewage systems shall be designed to minimize or eliminate infiltration of floodwaters into systems and discharges from systems into floodwaters in accordance with the plumbing provisions of this code and Chapter 3 of the~~

~~International Private Sewage Disposal Code.~~

~~R322.1.8 Flood-resistant materials.~~

~~Building materials and installation methods used for flooring and interior and exterior walls and wall coverings below the elevation required in Section R322.2 or R322.3 shall be flood damage-resistant materials that conform to the provisions of FEMA TB-2.~~

~~R322.1.9 Manufactured homes.~~

~~The bottom of the frame of new and replacement manufactured homes on foundations that conform to the requirements of Section R322.2 or R322.3, as applicable, shall be elevated to or above the elevations specified in Section R322.2 (flood hazard areas including A Zones) or R322.3 in coastal high-hazard areas (V Zones and Coastal A Zones). The anchor and tie-down requirements of the applicable state or federal requirements shall apply. The foundation and anchorage of manufactured homes to be located in identified floodways shall be designed and constructed in accordance with ASCE 24.~~

~~R322.1.10 As-built elevation documentation.~~

~~A registered design professional shall prepare and seal documentation of the elevations specified in Section R322.2 or R322.3.~~

~~R322.2 Flood hazard areas (including A Zones).~~

~~Areas that have been determined to be prone to flooding and that are not subject to high-velocity wave action shall be designated as flood hazard areas. Flood hazard areas that have been delineated as subject to wave heights between 11/2 feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Coastal A Zones and are subject to the requirements of Section R322.3. Buildings and structures constructed in whole or in part in flood hazard areas shall be designed and constructed in accordance with Sections R322.2.1 through R322.2.3.~~

~~R322.2.1 Elevation requirements.~~

1. ~~Buildings and structures in flood hazard areas, including flood hazard areas designated as Coastal A Zones, shall have the lowest floors elevated to or above the base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.~~

2. ~~In areas of shallow flooding (AO Zones), buildings and structures shall have the lowest floor (including basement) elevated to a height of above the highest adjacent grade of not less than the depth number specified in feet (mm) on the FIRM plus 1 foot (305 mm), or not less than 3 feet (15 mm) if a depth number is not specified.~~

3. ~~Basement floors that are below grade on all sides shall be elevated to or above base flood elevation plus 1 foot (305 mm), or the design flood elevation, whichever is higher.~~

~~Exception: Enclosed areas below the design flood elevation, including basements with~~

floors that are not below grade on all sides, shall meet the requirements of Section R322.2.2.

R322.2.2 Enclosed area below design flood elevation.
Enclosed areas, including crawl spaces, that are below the design flood elevation shall:

1. Be used solely for parking of vehicles, building access or storage.

2. Be provided with flood openings that meet the following criteria and are installed in accordance with Section R322.2.2.1:

   2.1. The total net area of nonengineered openings shall be not less than 1 square inch (645 mm^2) for each square foot (0.093 m^2) of enclosed area where the enclosed area is measured on the exterior of the enclosure walls, or the openings shall be designed as engineered openings and the construction documents shall include a statement by a registered design professional that the design of the openings will provide for equalization of hydrostatic flood forces on exterior walls by allowing for the automatic entry and exit of floodwaters as specified in Section 2.7.2.2 of ASCE 24.

   2.2. Openings shall be not less than 3 inches (76 mm) in any direction in the plane of the wall.

   2.3 The presence of louvers, blades, screens and faceplates or other covers and devices shall allow the automatic flow of floodwater into and out of the enclosed areas and shall be accounted for in determination of the net open area.

R322.2.2.1 Installation of openings. The walls of enclosed areas shall have openings installed such that:

1. There shall be not less than two openings on different sides of each enclosed area; if a building has more than one enclosed area below the design flood elevation, each area shall have openings.

2. The bottom of each opening shall be not more than 1 foot (305 mm) above the higher of the final interior grade or floor and the finished exterior grade immediately under each opening.

3. Openings shall be permitted to be installed in doors and windows; doors and windows without installed openings do not meet the requirements of this section.

R322.2.3 Foundation design and construction. Foundation walls for buildings and structures erected in flood hazard areas shall meet the requirements of Chapter 4.

Exception: Unless designed in accordance with Section R404:

1. The unsupported height of 6-inch (152 mm) plain masonry walls shall be not more than 3 feet (914 mm).

2. The unsupported height of 8-inch (203 mm) plain masonry walls shall be not more than 4 feet (1219 mm).

3. The unsupported height of 8-inch (203 mm) reinforced masonry walls shall be not more than 8 feet (2438 mm).

For the purpose of this exception, unsupported height is the distance from the finished grade of the under-floor space to the top of the wall.

R322.2.4 Tanks.

Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.2.1 or shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood.

R322.3 Coastal high-hazard areas (including V Zones and Coastal A Zones, where designated).

Areas that have been determined to be subject to wave heights in excess of 3 feet (914 mm) or subject to high-velocity wave action or wave-induced erosion shall be designated as coastal high-hazard areas. Flood hazard areas that have been designated as subject to wave heights between 1½ feet (457 mm) and 3 feet (914 mm) or otherwise designated by the jurisdiction shall be designated as Coastal A Zones. Buildings and structures constructed in whole or in part in coastal high-hazard areas and coastal A Zones, where designated, shall be designed and constructed in accordance with Sections R322.3.1 through R322.3.10.

R322.3.1 Location and site preparation.

1. New buildings and buildings that are determined to be substantially improved pursuant to Section R105.3.1.1 shall be located landward of the reach of mean high tide.

2. For any alteration of sand dunes and mangrove stands, the building official shall require submission of an engineering analysis that demonstrates that the proposed alteration will not increase the potential for flood damage.

R322.3.2 Elevation requirements.

1. Buildings and structures erected within coastal high-hazard areas and Coastal A Zones, shall be elevated so that the bottom of the lowest horizontal structural members supporting the lowest floor, with the exception of piling, pile caps, columns, grade beams and bracing, is elevated to or above the base flood elevation plus 1 foot (305 mm) or the design flood elevation, whichever is higher.

2. Basement floors that are below grade on all sides are prohibited.

3. The use of fill for structural support is prohibited.

4. Minor grading, and the placement of minor quantities of fill, shall be permitted for landscaping and for drainage purposes under and around buildings and for support of parking slabs, pool decks, patios and walkways.

5. Walls and partitions enclosing areas below the design flood elevation shall meet the requirements of Sections R322.3.4 and R322.3.5.

R322.3.3 Foundations.
Buildings and structures erected in coastal high hazard areas and Coastal A Zones shall be supported on pilings or columns and shall be adequately anchored to such pilings or columns. The space below the elevated building shall be either free of obstruction or, if enclosed with walls, the walls shall meet the requirements of Section R322.3.5. Pilings shall have adequate soil penetrations to resist the combined wave and wind loads (lateral and uplift). Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code. Pile embedment shall include consideration of decreased resistance capacity caused by scour of soil strata surrounding the piling. Pile systems design and installation shall be certified in accordance with Section R322.3.9. Spread footing, mat, raft or other foundations that support columns shall not be permitted where soil investigations that are required in accordance with Section R401.4 indicate that soil material under the spread footing, mat, raft or other foundation is subject to scour or erosion from wave velocity flow conditions. If permitted, spread footing, mat, raft or other foundations that support columns shall be designed in accordance with ASCE 24.

Exception: In Coastal A Zones, stem wall foundations supporting a floor system above and backfilled with soil or gravel to the underside of the floor system shall be permitted provided the foundations are designed to account for wave action, debris impact, erosion and local scour. Where soils are susceptible to erosion and local scour, stem wall foundations shall have deep footings to account for the loss of soil.

R322.3.4 Concrete slabs. Concrete slabs used for parking, floors of enclosures, landings, decks, walkways, patios and similar uses that are located beneath structures, or slabs that are located such that if undermined or displaced during base flood conditions could cause structural damage to the building foundation, shall be designed and constructed in accordance with one of the following:

1. To be structurally independent of the foundation system of the structure, to not transfer flood loads to the main structure, and to be frangible and break away under flood conditions prior to base flood conditions. Slabs shall be a maximum of 4 inches (102 mm) thick, shall not have turned down edges, shall not contain reinforcing, shall have isolation joints at pilings and columns, and shall have control or construction joints in both directions spaced not more than 4 feet (1219 mm) apart.
2. To be self supporting, structural slabs capable of remaining intact and functional

~~under base flood conditions, including erosion and local scour, and the main structure shall be capable of resisting any added flood loads and effects of local scour caused by the presence of the slabs.~~

~~R322.3.5 Walls below design flood elevation.~~

~~Walls and partitions are permitted below the elevated floor, provided that such walls and partitions are not part of the structural support of the building or structure and:~~

1. ~~Electrical, mechanical and plumbing system components are not to be mounted on or penetrate through walls that are designed to break away under flood loads; and~~

2. ~~Are constructed with insect screening or open lattice; or~~

3. ~~Are designed to break away or collapse without causing collapse, displacement or other structural damage to the elevated portion of the building or supporting foundation system. Such walls, framing and connections shall have a resistance of not less than 10 (479 Pa) and not more than 20 pounds per square foot (958 Pa) as determined using allowable stress design; or~~

4. ~~Where wind loading values of this code exceed 20 pounds per square foot (958 Pa), as determined using allowable stress design, the construction documents shall include documentation prepared and sealed by a registered design professional that:~~

   4.1. ~~The walls and partitions below the design flood elevation have been designed to collapse from a water load less than that which would occur during the base flood.~~

   4.2. ~~The elevated portion of the building and supporting foundation system have been designed to withstand the effects of wind and flood loads acting simultaneously on structural and nonstructural building components. Water loading values used shall be those associated with the design flood. Wind loading values shall be those required by this code.~~

5. ~~Walls intended to break away under flood loads as specified in Item 3 or 4 have flood openings that meet the criteria in Section R322.2.2, Item 2.~~

~~R322.3.6 Enclosed areas below design flood elevation.~~

~~Enclosed areas below the design flood elevation shall be used solely for parking of vehicles, building access or storage.~~

~~R322.3.6.1 Protection of building envelope.~~

~~An exterior door that meets the requirements of Section R609 shall be installed at the top of stairs that provide access to the building and that are enclosed with walls designed to break away in accordance with Section R322.3.5.~~

~~**R322.3.7 Stairways and ramps.** Stairways and ramps that are located below the lowest floor elevations specified in Section R322.3.2 shall comply with one or more of the following:~~

~~1. Be designed and constructed with open or partially open risers and guards.~~

~~2. Stairways and ramps not part of the required means of egress shall be designed and constructed to break away during design flood conditions without causing damage to the building or structure, including foundation.~~

~~3. Be retractable, or able to be raised to or above the lowest floor elevation, provided that the ability to be retracted or raised prior to the onset of flooding is not contrary to the means of egress requirements of the code.~~

~~4. Be designed and constructed to resist flood loads and minimize transfer of flood loads to the building or structure, including foundation.~~

~~Areas below stairways and ramps shall not be enclosed with walls below the design flood elevation unless such walls are constructed in accordance with Section R322.3.5.~~

~~**R322.3.8 Decks and porches.** Attached decks and porches shall meet the elevation requirements of Section R322.3.2 and shall either meet the foundation requirements of this section or shall be cantilevered from or knee braced to the building or structure. Self-supporting decks and porches that are below the elevation required in Section R322.3.2 shall not be enclosed by solid, rigid walls, including walls designed to break away. Self-supporting decks and porches shall be designed and constructed to remain in place during base flood conditions or shall be frangible and break away under base flood conditions.~~

~~**R322.3.9 Construction documents.**~~

~~The construction documents shall include documentation that is prepared and sealed by a registered design professional that the design and methods of construction to be used meet the applicable criteria of this section.~~

~~**R322.3.10 Tanks.**~~

~~Underground tanks shall be anchored to prevent flotation, collapse and lateral movement under conditions of the base flood. Above-ground tanks shall be installed at or above the elevation required in Section R322.3.2. Where elevated on platforms, the platforms shall be cantilevered from or knee braced to the building or shall be supported on foundations that conform to the requirements of Section R322.3.~~

R322 Flood-Resistant Construction

Buildings and structures constructed in flood hazard areas shall be designed and constructed in accordance with the provisions of the Code of the City, Chapter 10, Flood Prevention and Protection. In riverine flood hazard areas where design flood elevations are specified but floodways have not been designated, the applicant shall demonstrate that the cumulative effect of the proposed buildings and structures on design flood elevations, including fill, when combined with all other existing and anticipated development, will not increase the design flood elevation more than one foot at any point within the City.

(37) A new ***Section R328 Resource Efficiency*** is hereby added to read as follows:

R328 Resource Efficiency

R328.1 Construction waste management. For remodels and additions over 2,500 square feet, and for all new buildings, a construction waste management plan acceptable to the building official is required at the time of application for a building permit. The construction waste management plan shall be implemented and conspicuously posted on the construction site. All concrete, asphalt, masonry, wood, metals and cardboard shall be recycled. Compliance shall be certified by inspection and documentation and signed final construction waste management plans. Substantive changes to the plan shall be subject to prior approval by the building official. All roofing permits are required to submit a final waste management plan and documentation.

R328.1.1 Building demolitions. Buildings or portions of buildings that are removed shall be processed in such a way as to safely remove all asbestos and lead paint contaminants. For all demolitions, excluding non-structural demolitions under 1000 sq.ft. a demolition waste management plan acceptable to the building official is required at the time of application for a demolition permit. All metals, asphalt, concrete and masonry that are free of asbestos and lead paint shall be recycled, and where possible, all remaining materials, such as doors, windows, cabinets, fixtures, and wood, shall be recycled. Compliance shall be certified by inspection, documentation, and signed final demolition waste management plans. Substantive changes to the plan shall be subject to prior approval by the building official.

(38) A new ***Section R329 Indoor Environmental Quality*** hereby added to read as follows:

R329 Indoor Environmental Quality (IEQ)

R329.1 Low-volatile organic compound (VOC) materials. Construction materials, floor coverings and site applied finishes, including sealants and adhesives, resilient flooring, carpeting and pad, site-applied paints, stains and varnishes, structural wood panels, hardwood veneer plywood, particle board and fiber board *building* products, and insulation shall meet specified *volatile organic compound (VOC)* emissions limits in accordance with California Department of Public Health (CDPH) 01350; GREENGUARD Environmental Institute GGPS.001 standard for *building* materials and finishes; and Green Seal® standards. Documentation demonstrating compliance be required with delivery of such materials and shall be available for inspection.

Exception: For *alterations* to *existing buildings*, carpeting and pad, structural wood panels, hardwood, veneer plywood, particle board and fiber board *building* products and insulation are not subject to this requirement.

(39) A new ***Section R330 Outdoor Environmental Quality*** is hereby added to read as follows:

R330 Outdoor Environmental Quality (OEQ)

R330.1 Exterior lighting. All exterior lighting fixtures associated with new buildings shall have the "Fixture Seal of Approval" from the International Dark-Sky Association (IDA) or meet equivalent criteria approved by the *building official*. Lighting placement shall conform to IDA Model Lighting Ordinance for Lighting Zone LZ-1. Light shall be shielded such that the lamp itself or the lamp image is not directly visible outside the property perimeter.

(40) A new ***Section R331 Operations and Maintenance and Building Owner Education*** is hereby added to read as follows:

R331 Operations and Maintenance and *Building* Owner Education

R331.1 Operations and maintenance. In new buildings, operation and maintenance information addressing all installed systems shall be provided to the *building owner*.

(41) ***Section R401.1 Application*** is hereby retained in its entirety with the following amendments:

R401.1 Application. The provisions of this chapter shall control the design and construction of the foundation and foundation spaces for all buildings. In addition to the provisions of this chapter, the design and construction of foundations in flood hazard areas as established by Table R301.2(1) shall meet the provisions of Section R322. All foundations shall be designed by a qualified professional licensed in the State of Colorado. Such designs shall be performed in accordance with accepted and *approved* engineering practices, including considerations for soil load-bearing capacities, surface and subsurface water conditions, adequate foundation and floor drainage, adequate ventilation of enclosed interior foundation spaces, and foundation waterproofing and damp-proofing. Final engineer's reports, indicating his/her acceptance of the above requirements, shall be submitted to the *building official* prior to the issuance of the Certificate of Occupancy.

Exceptions:

1. Foundations for non-habitable detached accessory buildings. ~~and habitable additions of less than 120 sq ft. and unlikely to be located on expansive, compressible, or shifting soils, soils of unknown characteristics, or for other valid reasons as determined by the building official, need not be designed by a licensed professional.~~

~~1~~2. The provisions of this chapter shall be permitted to be used for wood foundations only in the following situations:

~~1~~a. In buildings that have no more than two floors and a roof.

~~2~~b. Where interior basement and foundation walls are constructed at intervals not exceeding 50 feet (15 240 mm).

Wood foundations in Seismic Design Category D_0, D_1 or D_2 shall be designed in accordance with accepted engineering practice.

(42) A new ***Section, R401.5 Placement of backfill*** is hereby added to read as follows:

R401.5 Placement of backfill. The excavation outside the foundation, including utility trenches and excavation ramp, shall be backfilled with soil that is substantially free of organic material, construction debris and cobbles, boulders, and solid soil masses larger than 6 inches (152 mm) diameter; or of frozen soil. The backfill shall be placed in lifts and compacted as set forth in the engineering documents. The backfill shall be placed in a manner that does not damage the foundation or the waterproofing or damp-proofing material. Excavation ramps shall be backfilled in such a manner that the ramp does not become a conduit for surface water to flow toward the foundation. Where excavations include more than one house, a specially engineered *drainage system* may be required by the *building official.*

(43) ***Section R405.1 Concrete or masonry foundations,*** is hereby retained in its entirety, including Table 405.1, with the following amendments:

R405.1 Concrete or masonry foundations. ~~Drains shall be provided around all concrete or masonry foundations that retain earth and enclose habitable or usable spaces located below *grade*. Drainage tiles, gravel or crushed stone drains, perforated pipe or other *approved* systems or materials shall be installed at or below the top of the footing or below the bottom of the slab and shall discharge by gravity or mechanical means into an *approved* drainage system. Gravel or crushed stone drains shall extend not less than 1 foot (305 mm) beyond the outside edge of the footing and 6 inches (152 mm) above the top of the footing and be covered with an *approved* filter membrane material. The top of open joints of drain tiles shall be protected with strips of building paper. Except where otherwise recommended by the drain manufacturer, perforated drains shall be surrounded with an *approved* filter membrane or the filter membrane shall cover the washed gravel or crushed rock covering the drain. Drainage tiles or perforated pipe shall be placed on not less than 2 inches (51 mm) of washed gravel or crushed rock not less than one sieve size larger than the tile joint opening or perforation and covered with not less than 6 inches (152 mm) of the same material.~~ Drains consisting of piping conforming with ASTM Designation D2729-89 shall be provided adjacent to the lowest concrete or masonry foundations that retain earth and enclose spaces that are partially or entirely located below *grade*. Unless perimeter drains are designed to daylight, they shall terminate in *sump* pits with an electrical power source permanently installed within 36 inches (914 mm) of the sump opening. Piping for *sump pumps* shall discharge at least 60 inches (1524 mm) away from foundations or as otherwise approved by the *building official*. Drains shall be installed in bedding materials that are of such size and installed in such manner to allow ground water to seep into the perimeter drain. Filter fabric or other measures to restrict the passage of fines shall be used to further protect the perimeter drain from blockage.

Exception: A drainage system is not required ~~where~~ when the engineer of record has determined that 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.

...

(44) A new ***Section R405.3 Landscape irrigation***, is added to read as follows:

R405.3 Landscape irrigation. Landscape irrigation systems, other than drip systems, shall be installed such that the ground surface within 60 inches (1524 mm), measured perpendicular from the foundation, is not irrigated.

(45) ***Section R408.1Ventilation*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**R408.1 Ventilation.** The under-floor space between the bottom of the floor joists and the earth under any building (except space occupied by a *basement*) shall have ventilation openings through foundation walls or exterior walls. The minimum net area of ventilation openings shall not be less than 1 square foot (0.0929 m^2) for each 150 square feet (14 m^2) of under-floor space area, unless the ground surface is covered by a Class 1 vapor retarder material. Where a Class 1 vapor retarder material is used, the minimum net area of ventilation openings shall not be less than 1 square foot (0.0929 m^2) for each 1,500 square feet (140 m^2) of under-floor space area. One such ventilating opening shall be within 3 feet (914 mm) of each corner of the building.~~

R408.1 Underfloor ventilation. Underfloor ventilation shall be provided per section R408.3.
Exception: When the Building Official determines site conditions exist that would require a vented under-floor space (cold crawl), such as groundwater and other conditions, the owner can provide underfloor ventilation per section R408.2.

(46) A new ***Section R408.3.1 Spaces under below-grade floors***, is hereby added to read as follows:

R408.3.1 Spaces under below-grade floors. Mechanical ventilation systems for spaces under below-grade floors shall be designed by a professional engineer and installed in accordance with such designs.

(47) A new ***Section R703.4 Flashing*** is hereby deleted in its entirety to read as follows:

~~**R703.4 Flashing.** Approved corrosion-resistant flashing shall be applied shingle fashion in a manner to prevent entry of water into the wall cavity or penetration of water to the building structural framing components. Self-adhered membranes used as flashing shall comply with AAMA 711. Fluid-applied membranes used as flashing in exterior walls shall comply with AAMA 714. The flashing shall extend to the surface of the exterior wall finish. Approved corrosion-resistant flashings shall be installed at the following locations:~~

~~1. Exterior window and door openings. Flashing at exterior window and door openings shall extend to the surface of the exterior wall finish or to the water-resistive barrier complying with Section 703.2 for subsequent drainage. Mechanically attached flexible flashings shall comply with AAMA 712. Flashing at exterior window and door openings shall be installed in accordance with one or more of the following:~~

~~1.1. The fenestration manufacturer's installation and flashing instructions, or for applications not addressed in the fenestration manufacturer's instructions, in accordance with the flashing manufacturer's instructions. Where flashing instructions or details are not provided, pan flashing shall be installed at the sill of exterior window and door openings. Pan flashing shall be sealed or sloped in such a manner as to direct water to the surface of the exterior wall finish or to the waterresistive barrier for subsequent drainage. Openings using pan flashing shall incorporate flashing or protection at the head and sides.~~

~~1.2. In accordance with the flashing design or method of a registered design professional.~~

~~1.3. In accordance with other approved methods.~~

~~2. At the intersection of chimneys or other masonry construction with frame or stucco walls, with projecting lips on both sides under stucco copings.~~

~~3. Under and at the ends of masonry, wood or metal copings and sills.~~

~~4. Continuously above all projecting wood trim.~~

~~5. Where exterior porches, decks or stairs attach to a wall or floor assembly of wood-frame construction.~~

~~6. At wall and roof intersections.~~

~~7. At built-in gutters.~~

R703.4 Fenestration installation. For all new construction, all *fenestration* installations shall be in accordance with American Architectural Manufacturers Association (AAMA) Standards/ Specifications for Windows, Doors and Skylights and shall be supervised or inspected by an individual certified as an Installation Master or by one having attended training by the manufacturer of the specific window product being installed. *Fenestration* perimeter flashing shall be installed per Installation Masters Chapter 16 Method A or A1, including either rigid or flexible sill pan flashing.

(48) A new ***Section R703.11.3 Vinyl siding on new buildings*** is hereby added to read as follows:

Section R703.11.3 Vinyl siding and soffits on new buildings. Vinyl siding and soffits on new buildings shall be installed over one-hour fire-rated assemblies listed for exterior fire exposure, in both the vertical and horizontal plane.

(49) A new ***Section R703.13.2 Insulated vinyl siding on new buildings*** is hereby added to read as follows:

Section R703.13.2 Insulated vinyl siding on new buildings. Insulated vinyl siding on new buildings shall be installed over one-hour fire-rated assemblies listed for exterior fire exposure, in both the vertical and horizontal plane.

(50) A new ***Section R703.14.4 Polypropylene siding on new buildings*** is hereby added to read as:

R703.14.3 Polypropylene siding on new buildings. Polypropylene on new buildings shall be installed over one-hour fire-rated assemblies listed for exterior fire exposure, in both the vertical and horizontal plane.

(51) ***Section R902.1 Roofing Covering Materials*** is hereby deleted and is replaced with the following in lieu thereof:

R902.1 Roofing covering materials. ~~Roofs shall be covered with materials as set forth in Sections R904 and R905. Class A, B or C roofing shall be installed in jurisdictions designated by law as requiring their use or when the edge of the roof is less than 3 feet (914 mm) from a lot line. Classes A, B and C roofing required by this section to be listed shall be tested in accordance with UL 790 or ASTM E 108.~~

~~**Exceptions:**~~

~~1. Class A roof assemblies include those with coverings of brick, masonry and exposed concrete roof deck.~~

~~2. Class A roof assemblies include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile, or slate installed on noncombustible decks.~~

~~3. Class A roof assemblies include minimum 16 ounces per square foot copper sheets installed over combustible decks.~~

~~4. Class A roof assemblies include slate installed over underlayment over combustible decks.~~

R902.1 Roofing covering material. Except as otherwise allowed, roofs shall be covered with materials listed as Class A and with materials as set forth in Sections R904 and R905. Classes A, B and C roofing required to be listed by this Section shall be tested in accordance with UL 790 or ASTM E 108. Roof assemblies with coverings of brick, masonry, slate, clay or concrete roof tile, exposed concrete roof deck, ferrous or copper shingles or sheets, and metal sheets and shingles, shall be considered Class A roof coverings.

Exception: Any Class B or Class C roof covering may be applied on any new construction that is added to an existing building, provided the roof extremities of such existing building and new construction are located a minimum distance of 5 feet (1.524 m) from the nearest adjacent property line and are a minimum distance of 10 feet (3.048 m) from another building.

(52) ***Section R905.1.2 Ice barriers*** is hereby retained in its entirety with the following amendments:

R905.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water as designated in Table R301.2(1), an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles and wood shakes. The ice barrier shall consist of not fewer than two layers of underlayment cemented together, or a self-adhering polymer-modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building. On roofs with slope equal to or greater than eight units vertical in 12 units horizontal (67-percent slope), the ice barrier shall also be applied not less than 36 inches (914 mm) measured along the roof slope from the eave edge of the building.

Exceptions:

1. Detached accessory structures not containing conditioned floor area.

2. Re-roofing where the existing roof covering has not been removed.

(53) ***Section R905.2.1 Sheathing requirements*** is hereby retained in its entirety with the following amendments:

R905.2.1 Sheathing requirements Asphalt shingles shall be fastened to solidly sheathed decks. Gaps in the solid decking shall not exceed 1/8 inch.

(54) A new ***Section R905.2.4.2 Impact resistance of asphalt shingles*** is added to read as follows:

R905.2.4.2 Impact resistance of asphalt shingles. Asphalt shingles shall be Class 4 impact resistant and be tested in accordance with UL 2218 and installed in accordance with the manufacturer's installation instructions.

(55) ***Section R908.1 General*** is hereby retained in its entirety with the following amendments:

R908.1 General. Materials and methods of application used for re-covering or replacing an existing roof covering shall comply with the requirements of Chapter 9.

Exceptions:

1. Reroofing shall not be required to meet the minimum design slope requirement of one-quarter unit vertical in 12 units horizontal (2-percent slope) in Section R905 for roofs that provide positive roof drainage.

2. For roofs that provide positive drainage, re-covering or replacing an existing roof covering shall not require the secondary (emergency overflow) drains or scuppers of Section R903.4.1 to be added to an existing roof.

3. Any existing roof covering system may be replaced with a roof covering of the same materials and classification, provided the replacement roof covering has a minimum rating of Class C.

(56) ***Section R1004.1 General*** is hereby retained in its entirety with the following amendments:

R1004.1 General. Factory-built fireplaces shall be *listed* and *labeled* and shall be installed in accordance with the conditions of the *listing*. Factory-built fireplaces shall be tested in accordance with UL 127. Solid fuel fireplaces, fireplace stoves and solid-fuel-type room heaters shall also comply with Section 5-110 of the City Code and shall be provided with a spark arrestor.

(57) ***Section R1004.4 Unvented Gas log Heaters*** is hereby deleted in its entirety.

~~**R1004.4 Unvented gas log heaters.** An unvented gas log heater shall not be installed in a factory-built fireplace unless the fireplace system has been specifically tested, *listed* and *labeled* for such use in accordance with UL 127.~~

(58) ***Section N1101.5 (R103.2) Information on construction documents,*** is hereby kept and preserved in its entirety with the following amendments:

N1101.5 (~~C103~~ R103.2) **Information on construction documents.** Construction documents for all buildings shall describe the exterior wall envelope in sufficient detail to determine compliance with this code. When applicable as determined by the *building official*, construction documents submitted as part of the building permit application shall provide details of the exterior wall envelope as required, including flashing, intersections of dissimilar materials, corners, end details, control joints, intersections at roof, eaves, or parapets, means of drainage, water-resistive membrane, and details around openings. The construction documents shall include manufacturing installation instructions that provide supporting documentation that the proposed penetration and opening details described in the construction documents maintain the weather resistance of the exterior wall envelope. The supporting documentation shall fully describe the exterior wall system which was tested, where applicable, as well as the test procedure used. Construction documents shall be drawn to scale upon suitable material. Electronic media documents are permitted to be submitted when *approved* by the *building official*. Construction documents shall be of sufficient clarity to indicate the location, nature and extent of the work proposed, and shows in sufficient detail pertinent data and features of the building, systems and equipment as herein governed. Details shall include, but are not limited to, as applicable:

1. Insulation materials and their *R*-values.

2. Fenestration *U*-factors and *solar heat gain coefficients* (SHGC).
3. Area-weighted *U*-factor and *solar heat gain coefficient* (SHGC) calculations.
4. Mechanical system design criteria.
5. Mechanical and service water heating systems and equipment types, sizes and efficiencies.
6. Equipment and system controls.
7. Duct sealing, duct and pipe insulation and location.
8. Air sealing details.

(59) ***Table N1102.1.2 (Table R402.1.2) Insulation and fenestration ~~criteria~~ requirements by component*** is hereby retained in its entirety with the following amendments:

TABLE N1102.1.2
INSULATION AND FENESTRATION REQUIREMENTS BY COMPONENT[a]

CLIMATE ZONE HEATING SYSTEM TYPE	FENESTRATION *U*-FACTOR[b]	SKYLIGHT[b] *U-FACTOR*	GLAZED FENESTRATION SHGC	CEILING *R-VALUE*	WOOD FRAME WALL *R*-VALUE [f g]	MASS WALL *R*-VALUE[g]	FLOOR *R*-VALUE[e]	BASEMENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL[c] SPACE WALL *R*-VALUE
~~1~~ *Non-Electric heat*	~~NR~~ 0.30	~~0.75~~ 0.55	~~0.25~~ NR	~~30~~ 49	~~13~~ 20 or 13 + 5	~~3/4~~ 13/17	~~13~~ 30	~~0~~ 10/13h 15/19i	~~0~~ 10,2 ft	~~0~~ 10/13j 15/19i
~~2~~ *Electric heat*	~~0.40~~ 0.30	~~0.65~~ 0.55	~~0.25~~ NR	~~38~~ 49	~~13~~ 20+5	~~4/6~~ 15/19	~~13~~ 30	~~0~~ 15/19	~~0~~ 10,3 ft	~~0~~ 15/19
~~3~~	~~0.32~~	~~0.55~~	~~0.25~~	~~38~~	~~20 or 13 + 5[h]~~	~~8/13~~	~~19~~	~~5/13[f]~~	~~0~~	~~5/13~~
~~4 except Marine~~	~~0.32~~	~~0.55~~	~~0.40~~	~~49~~	~~20 or 13 + 5[h]~~	~~8/13~~	~~19~~	~~10/13~~	~~10, 2ft~~	~~10/13~~
~~5 and Marine 4~~	~~0.32~~	~~0.55~~	~~NR~~	~~49~~	~~20 or 13 + 5[h]~~	~~13/17~~	~~30[q]~~	~~15/19~~	~~10, 2ft~~	~~15/19~~
~~6~~	~~0.32~~	~~0.55~~	~~NR~~	~~49~~	~~20 + 5 or 13 + 10[h]~~	~~15/20~~	~~30[q]~~	~~15/19~~	~~10, 4ft~~	~~15/19~~
~~7 and 8~~	~~0.32~~	~~0.55~~	~~NR~~	~~49~~	~~20 + 5 or 13 + 10[h]~~	~~19/21~~	~~38[q]~~	~~15/19~~	~~10, 4 ft~~	~~15/10~~

For SI: 1 foot = 304.8 mm.
NR = Not Required.
a. *R*-values are minimums. *U*-factors and SHGC are maximums. Where insulation is installed in a cavity that is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall be not less than the *R*-value specified in the table.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: In Climate Zones 1 through 3, skylights shall be permitted to be excluded from glazed fenestration SHGC requirements provided that the SHGC for such skylights does not exceed 0.30.
c. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation on the interior of the basement wall. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation on the interior of the basement wall. Alternatively, compliance with "15/19" shall be R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home.
d. R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation *R*-value for slabs. as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
e. There are no SHGC requirements in the Marine Zone.

f. Basement wall insulation shall not be required in warm-humid locations as defined by Figure N1101.10 and Table N1101.10.
g. Alternatively, insulation sufficient to fill the framing cavity providing not less than an *R*-value of R-19.
h. The first value is cavity insulation, the second value is continuous insulation. Therefore, as an example, "13+5" means R-13 cavity insulation plus R-5
continuous insulation.
i. Mass walls shall be in accordance with Section N1102.2.5. The second *R*-value applies where more than half of the insulation is on the interior of the masswall.
j. All rim joists and adjoining plates shall be air-sealed and insulated using spray foam insulation to R-15 minimum.
k. All rim joists and adjoining plates shall be air-sealed.
l. R-15 batt is allowed for existing dwellings with uninsulated basements.

(60) ***Table N1102.1.4 (Table R402.1.4) Equivalent U-Factors*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

TABLE N1102.1.4
EQUIVALENT *U*-FACTORS[a]

~~CLIMATE ZONE~~ HEATING SYSTEM TYPE	FENESTRATION *U*-FACTOR	SKYLIGHT *U-FACTOR*	CEILING ~~*UR-*~~ *VALUE*	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
~~*1*~~ *Nonelectric heat*	~~*0.50*~~ 0.30	~~*0.75*~~ 0.55	~~*0.035*~~ 0.026	~~*0.082*~~ 0.060	~~*0.197*~~ 0.082	~~*0.064*~~ 0.033	~~*0.360*~~ 0.050	~~*0.477*~~ 0.055
~~*2*~~ Electric heat	~~*0,40*~~ 0.30	~~*0.65*~~ 0.55	~~*0.030*~~ 0.026	~~*0.082*~~ 0.048	~~*0.165*~~ 0.060	~~*0.064*~~ 0.033	~~*0.360*~~ 0.050	~~*0.477*~~ 0.055
~~4 except Marine~~	~~*0.35*~~	~~*0.55*~~	~~*0.026*~~	~~*0.057*~~	~~*0.098*~~	~~*0.047*~~	~~*0.059*~~	~~*0.065*~~
~~5 and Marine 4~~	~~*0.32*~~	~~*0.55*~~	~~*0.26*~~	~~*0.057*~~	~~*0.082*~~	~~*0.033*~~	~~*0.050*~~	~~*0.055*~~
~~6~~	~~*0.32*~~	~~*0.55*~~	~~*0.026*~~	~~*0.048*~~	~~*0.060*~~	~~*0.033*~~	~~*0.050*~~	~~*0.055*~~
~~7 and 8~~	~~*0.32*~~	~~*0.55*~~	~~*0.026*~~	~~*0.048*~~	~~*0.057*~~	~~*0.028*~~	~~*0.050*~~	~~*0.055*~~

a. Non-fenestration *U*-factors shall be obtained from measurement, calculation or an *approved* source.
b. ~~Mass walls shall be in accordance with Section N1102.2.5~~. Where more than half the insulation is on the interior, ~~the mass wall U-factors shall be a maximum of 0.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.087 in Zone 4 except Marine, 0.065 in Zone 5 and Marine 4, and 0.057 in Zones 6 through 8.~~ the mass wall *U*-factor shall be the same as the frame wall *U*-factor.
~~c. Basement wall *U*-factor of 0.360 in warm-humid locations as defined by Figure N1101.10 (R301.1) and Table (R301.1)~~

(61) ***Section N1102.2 (R402.2) Specific insulation requirements*** is hereby retained in its entirety with the following amendments:

N1102.2 (R402.2) Specific insulation requirements (Prescriptive) In addition to the requirements of Section N1102.1, insulation shall meet the specific requirements of Sections N1102.2.1 through N1102.2.13. All insulation shall be installed to meet Residential Energy Services Network (RESNET) Grade I standard with six-sided encapsulation.

(62) ***Section N1102.2.3 (R402.2.3) Eave baffles*** is hereby retained in its entirety with the following amendments:

N1102.2.3 (R402.2.3) Eave baffles and blocks (Mandatory). For air permeable insulations in vented attics with ventilation from open or box soffits, a baffle shall be installed to provide ventilation from the soffit to the attic adjacent to each soffit or eave vent. In the case of continuous soffit vents, enough baffles shall be installed to maintain the required attic ventilation from the soffit. The ventilation baffles shall extend over the top of the attic insulation between rafters or trusses, maintaining a minimum 1" clear

opening below the roof deck and sufficient space for the minimum depth of attic insulation. The baffle shall be permitted to be any solid material. All other spaces between rafters or trusses shall be blocked full height, at the outside edge of the exterior wall top plate, with air impermeable materials so as to contain the attic insulation to a minimum R-19 over the exterior wall top plate.

(63) ***Section N1102.2.10 Slab-on-grade floors*** is hereby retained in its entirety with the following amendments:

N1102.2.10 Slab-on-grade floors (Mandatory) Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table N1102.1.2. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table N1102.1.2 by any combination of vertical insulation, insulation extending under the slab, or insulation extending out from the *building*. Insulation extending away from the *building* shall be protected by pavement or by not less than 10 inches (254 mm) of soil. The top edge of the insulation installed between the *exterior wall* and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the *exterior wall*. Slab-edge insulation is not required in jurisdictions designated by the *building official* as having a very heavy termite infestation.

(64) **A new *Section N1102.2.14 (R402.2.14) Rim insulation requirements*** is hereby added to read as follows:

N1102.2.14 (R402.2.14) Rim insulation requirements All rim plates and rim joist that are part of the thermal envelope shall be air-sealed. All rim plates and rim joist that are part of the thermal envelope shall be insulated using spray foam materials to R-15 minimum when the basement walls are insulated to 10/13 in accordance with Table N1102.1.2. Where spray foam insulation is not used at the rim joist and adjoining plates, the rim joists and adjoining plates shall be insulated to minimum R-19.

(65) ***Section N1102.4.1.2 (R402.4.1.2) Testing*** is hereby retained in its entirety with the following amendments:

N1102.4.1.2 (R402.4.1.2) Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate of not exceeding five air changes per hour in ~~Climate~~ Zones 1 and 2, and three air changes per hour in ~~Climate~~ Zones 3 through 8. Testing shall be conducted in accordance with ~~RESNET/ICC 380~~ ASTME E779 or ASTEM E1827 and reported at a pressure of 0.2 inch w.g. (50 Pascals). Where required by the *building 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 *building official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*. Testing shall comply with the City of Fort Collins Building Code Air Tightness Testing Protocols for new attached and detached single family dwellings.

. . .

(66) ***Section N1102.5 Maximum fenestration U-factor and SHGC*** **(Mandatory)** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**N1102.5 (R402.5) Maximum fenestration *U*-factor and SHGC (Mandatory).** The area-weighted average maximum fenestration *U* factor permitted using tradeoffs from Section N1102.1.4 or N1105 shall be 0.48 in Climate Zones 4 and 5 and 0.40 in Climate Zones 6 through 8 for vertical fenestration, and 0.75 in Climate Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using tradeoffs from Secton N1105 in Climate Zones 1 through 3 shall be 0.50.~~

N1102.5 (R402.5) Maximum *fenestration U-factor* and *SHGC* (Mandatory). For new construction and additions that require a building permit, the area-weighted average maximum *fenestration U-factor* permitted using trade-offs from Section N1102.1.4 or N1105 shall be 0.40 *for vertical fenestration*, and 0.75 for *skylights*.

(67) ***Section N1103.3.1 (R403.3.1) Insulation*** is hereby retained in its entirety with the following amendments:

N1103.3.1 (R403.3.1) **Insulation ~~(Prescriptive)~~ (Mandatory).** Supply and return ducts in attics shall be insulated to an *R*-value of not less than R-8 for ducts 3 inches (76 mm) in diameter and larger and not less than R-6 for ducts smaller than 3 inches (76 mm) in diameter. Supply and return ducts in other portions of the *building* shall be insulated to not less than R-6 for ducts 3 inches (76 mm) in diameter and to not less than R-4.2 for ducts smaller than 3 inches (76.2 mm) in diameter.

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

(67) ***Section N1103.3.7 (R403.3.7)*** **Ducts located in conditioned space** is hereby retained in its entirety with the following amendments:

N1103.3.7 (R403.3.7) Ducts located in conditioned space. For ducts to be considered as inside a conditioned space, ~~such ducts shall comply with either of the following:~~ the duct system shall be located completely within the continuous air barrier and within the building thermal envelope.

~~1. The duct system is located completely within the continuous air barrier and within the building thermal envelope.~~
~~2. The ducts are buried within ceiling insulation in accordance with Section N1103.3.6 and all of the following conditions exist:~~
~~2.1. The air handler is located completely within the continuous air barrier and within the building thermal envelope.~~
~~2.2. The duct leakage, as measured either by a rough-in test of the ducts or a post-construction total system leakage test to outside the building thermal envelope in accordance with Section N1103.3.4, is less than or equal to 1.5 cubic feet per minute (42.5 L/min) per 100 square feet (9.29 m^2) of conditioned floor area served by the duct system.~~

~~2.3. The ceiling insulation R-value installed against and above the insulated duct is greater than or equal to the proposed ceiling insulation R-value, less the R-value of the insulation on the duct.~~

(68) ***Section N1105.1 (R405.1) Scope*** is hereby retained in its entirety with the following amendments:

N1105.1 (R405.1) Scope. This section establishes criteria for compliance using simulated energy performance analysis. Such analysis shall include heating, cooling, ~~mechanical ventilation~~ and service water heating energy only. In addition, requirements for the Simulated Performance Alternative are detailed within the City of Fort Collins Residential New Construction Simulated Performance Alternative (SPA) Guide.

Exception: In addition to all Mandatory sections, new buildings, additions, or alterations where the primary heat source is electrical shall comply with prescriptive portions of the code.

(69) **A new *Section M1309 Testing and verification*** is hereby added to read as follows:

M1309 Testing and verification. Installed heating, cooling and *ventilation* systems shall be performance-tested and adjusted per City of Fort Collins, Residential New Construction Mechanical Systems Testing Guide and to operate within design specifications, in accordance with ANSI/ACCA QI 5-2010 *HVAC Quality Installation Specification*. Documentation of results shall be submitted to the *building official* prior to the issuance of the Certificate of Occupancy.

(70) ***Section M1401.3 Equipment and appliance sizing*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**M1401.3 Equipment and appliance sizing.**~~
~~Heating and cooling equipment and appliances shall be sized in accordance with ACCA Manual S or other approved sizing methodologies based on building loads calculated in accordance with ACCA Manual J or other approved heating and cooling calculation methodologies.~~

~~**Exception:** Heating and cooling equipment and appliance sizing shall not be limited to the capacities determined in accordance with Manual S where either of the following conditions applies:~~

~~1. The specified equipment or appliance utilizes multistage technology or variable refrigerant flow technology and the loads calculated in accordance with the approved heating and cooling calculation methodology are within the range of the manufacturer's published capacities for that equipment or appliance.~~

~~2. The specified equipment or appliance manufacturer's published capacities cannot satisfy both the total and sensible heat gains calculated in accordance with the approved~~

~~heating and cooling calculation methodology and the next larger standard size unit is specified.~~

M1401.3 Heating and cooling system design. The design of new heating and cooling systems shall meet the requirements of this Section. Design documents shall be submitted to the *building official* at the time of application for a building permit.

M1401.3.1 Equipment sizing. Heating and cooling equipment shall be sized in accordance with ACCA Manual S, based on design *building* loads calculated in accordance with ACCA Manual J, or other equivalent methodology approved by the *building official*, using thermal design parameters in Table N1101.1 as amended. The total *equipment* output capacity shall be between the following limits, as applicable for the *equipment* type:

1. 95% and 115% of calculated system cooling load, for air conditioners and heat pumps;

2. 95% and 125% of calculated system cooling load, for heat pumps with winter heating dominated requirements;

3. 100% and 140% of calculated system heating load, for warm air systems, unless dictated by the cooling *equipment* selection; and

4. 100% and 115% of calculated system heating load, for heating boilers.

Where no available *equipment* is within the applicable capacity limits, the next largest nominal piece of *equipment* that is available may be used.

M1401.3.2 Room loads. Room-by-room design heating and cooling loads shall be calculated.

M1401.3.3 Matched components. Air-conditioning, Heating and Refrigeration Institute (AHRI) matched evaporators, condensing units and air handlers shall be required.

(71) ***Section, M1414.1 General*** is hereby retained in its entirety with the following amendments:

M1414.1 General. Fireplace stoves shall be listed, labeled and installed in accordance with the terms of the listing. Fireplace stoves shall be tested in accordance with UL 737. Wood burning appliances shall meet the latest emission standards as stated by the State of Colorado and Federal Regulation 40 CFR Part 60, Subpart AAA.

(72) A new ***Section M1501.2 Indoor depressurization*** is hereby added to read as follows:

M1501.2 Indoor depressurization. Ducted exhaust systems shall not induce or create a negative pressure sufficient to cause back-drafting of naturally vented, open combustion-chamber, fuel-burning appliances, or create negative pressure in excess of negative 3 Pa.

in the immediate proximity of combustion chambers of such appliances.

(73) ***Section M1502.4.2 Duct installation*** is hereby retained in its entirety with the following amendments:

M1502.4.2 Duct installation. Exhaust ducts shall be supported at intervals not to exceed 12 feet (3658 mm) and shall be secured in place. The insert end of the duct shall extend into the adjoining duct or fitting in the direction of airflow. Exhaust duct joints shall be sealed in accordance with Section M1601.4.1 and shall be mechanically fastened. Ducts shall not be joined with screws or similar fasteners. ~~that protrude more than 1/8 inch (3.2 mm) into the inside of the duct~~. Where dryer exhaust ducts are enclosed in wall or ceiling cavities, such cavities shall allow the installation of the duct without deformation.

(74) ***Section*** M1505.4 ***Whole-house mechanical ventilation system*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**M1505.4 Whole-house mechanical ventilation system.** Whole house mechanical ventilation systems shall be designed in accordance with Sections M1505.4.1 throughM1505.4.4.~~

~~**M1505.4.1 System design.** The whole house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered to provide supply ventilation.~~

~~**M1505.4.2 System controls.** The whole house mechanical ventilation system shall be provided with controls that enable manual override.~~

~~**M1505.4.3 Mechanical ventilation rate.** The whole house mechanical ventilation system shall provide outdoor air at a continuous rate as determined in accordance with TableM1505.4.3(1) or Equation 15-1.~~

~~Ventilation rate in cubic feet per minute = (0.01 x total square foot area of house) + [7.5 x (number of bedrooms + 1)]~~
~~**Equation 15-1**~~

~~**Exception:** The whole house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25 percent of each 4 hour segment and the ventilation rate prescribed in Table M1505.4.3(1) is multiplied by the factor determined in accordance with Table M1505.4.3(2).~~

M1505.4 Whole-dwelling unit mechanical ventilation system. For new *buildings*, a mechanical exhaust system, supply system, or combination thereof shall be installed for each *dwelling unit* to provide whole-*dwelling unit ventilation*. Such system shall comply

with Sections M1505.4.1 through M1505.4.4. System design documents shall be submitted to the Building Official at the time of application for a building permit.

(75) ***Section M1601.1 Duct design*** is hereby retained in its entirety with the following amendments:

M1601.1 Duct design. *Duct systems* serving heating, cooling and *ventilation equipment* in new buildings or new systems in additions shall be designed and fabricated in ~~installed in~~ accordance with the provisions of this section and *ACCA Manual D*~~, the appliance manufacturer's installation instructions~~ or other approved methods.

(76) ***Section M1601.1.1 Above-ground duct systems,*** is hereby retained in its entirety with the exception of subsection 7 (including subsections 7.1 through 7.5), which is stricken in its entirety.

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

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

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

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

~~7.4. Stud wall cavities and joist space plenums shall be isolated from adjacent concealed spaces by tight fitting 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.~~

. . .

(77) **A new *Section, M1601.4.11 Construction debris and contamination*** is hereby added to read as follows:

M1601.4.11 Construction debris and contamination. Mechanical air-handling systems and their related ducts shall be protected from the entrance of dirt, debris, and dust during the construction and installation process. Prior to passing final inspection or issuance of a Certificate of Occupancy, such systems shall be substantially free of construction-related contaminants.

(78) ***Section M1602.2 Return air openings*** is hereby retained in its entirety with the following amendments:

M1602.2 Return ~~Air~~air ~~Openings~~ openings. A return air path shall be provided in all habitable rooms by means of ducts or transfer grills. Return air openings for heating, ventilation and air conditioning systems shall comply with all of the following:

. . .

(79) ***Section G2404.3 (301.3) Listed and labeled*** is hereby retained in its entirety with the following amendments:

G2404.3 (301.3) Listed and labeled. *Appliances* regulated by this *code* shall be listed and labeled for the application in which they are used unless otherwise *approved* in accordance with Section R104.11." ~~The approval of unlisted *appliances* in accordance with Section R104.11 shall be based upon *approved* engineering evaluation.~~

(80) ***Section G2406.2 (303.3) Prohibited locations*** is hereby retained in its entirety with the exception of subsections 3 and 4 which are stricken in their entirety.

~~3. A single wall mounted *unvented room heater* is installed in a bathroom and such *unvented room heater* is equipped as specified in Section G2445.6 and has an input rating not greater than 6,000 *Btu*/h (1.76 kW). The bathroom shall meet the required volume criteria of Section G2407.5.~~

~~4. A single wall mounted *unvented room heater* is installed in a bedroom and such *unvented room heater* is equipped as specified in Section G2445.6 and has an input rating not greater than 10,000 *Btu*/h (2.93 kW). The bedroom shall meet the required volume criteria of Section G2407.5.~~

. . .

(81) ***Section G2407.11 (304.11) Combustion air ducts*** is hereby retained in its entirety with the following amendments:

G2407.11(304.11) Combustion air ducts. *Combustion air* ducts shall comply with all of the following:

1. Ducts shall be constructed of galvanized steel complying with Chapter 16 or of a material having equivalent corrosion resistance, strength and rigidity.

Exception: ~~Within dwellings units, unobstructed stud and joist spaces shall not be prohibited from conveying *combustion air*, provided that not more than one required fireblock is removed.~~ Where the installation of galvanized steel ducts is not practical due to existing finish materials within *dwelling units* that are undergoing alteration or reconstruction, unobstructed stud and joist spaces shall not be prohibited from conveying combustion air, provided that not more than one required fireblock is removed.

. . .

9. All combustion air openings or ducts shall be readily identifiable with an approved label or by other means warning persons that obstruction of such openings or ducts

may cause fuel-burning equipment to release combustion products and dangerous levels of carbon monoxide into the building.

...

(82) ***Section G2415.12 (404.12) Minimum burial depth*** is hereby retained in its entirety with the following amendments:

G2415.12 (404.12) Minimum burial depth. Underground piping systems shall be installed a minimum depth of ~~12 inches (305 mm)~~ 18 inches (457 mm) below grade, ~~except as provided for in Section G2415.12.1.~~ all other pipe materials shall be installed a minimum depth of 12 inches below grade.

(83) ***Section G2415.12.1 (404.12.1) Individual outside appliance*** is hereby deleted in its entirety.

~~**G2415.12.1 (404.12.1) Individual outside appliances.** Individual lines to outside lights, grills or other appliances shall be installed a minimum of 8 inches (203 mm) below finished grade.~~

(84) ***Section G2417.4.1 (406.4.1) Test pressure*** is hereby deleted in its entirety and the following is hereby added in lieu thereof:

~~**G2417.4.1 (406.4.1) Test pressure.** The test pressure to be used shall be not less than 11/2 times the proposed maximum working pressure, but not less than 3 psig (20 kPa gauge), irrespective of design pressure. Where the test pressure exceeds 125 psig (862 kPa gauge), the test pressure shall not exceed a value that produces a hoop stress in the *piping* greater than 50 percent of the specified minimum yield strength of the pipe.~~

G2417.4.1 (406.4.1) Test pressure. The test pressure to be used for non-welded pipe shall be 10psi minimum and 60 psi for welded pipe.

(85) ***Section G2425.8 (501.8) Appliances not required to be vented*** is hereby kept and preserved in its entirety with the following amendments:

G2425.8 (501.8) Appliances not required to be vented. The following *appliances* shall not be required to be vented.

1. Ranges.
2. Electric ~~B~~built-in domestic cooking units *listed* and marked for optional venting.
3. Hot plates and laundry stoves.
4. *Type 1 clothes dryers* (*Type 1 clothes dryers* shall be exhausted in accordance with the requirements of Section G2439).
5. Refrigerators.
6. Counter *appliances*.
7. ~~Room heaters listed for unvented use.~~

Where the *appliances* listed in Items 5 through 7 are installed so that the aggregate input rating exceeds 20 Btu per hour per cubic foot (207 W/m^3) of volume of the room or space in which such *appliances* are installed, one or more shall be provided with venting *systems* or other *approved* means for conveying the *vent gases* to the outdoor atmosphere so that the aggregate input rating of the remaining *unvented appliances* does not exceed 20 Btu per hour per cubic foot (207 W/m^3). Where the room or space in which the *appliance* is installed is directly connected to another room or space by a doorway, archway or other opening of comparable size that cannot be closed, the volume of such adjacent room or space shall be permitted to be included in the calculations.

(86) ***Section G2427.5.5.1 (503.5.6.1) Chimney lining*** is hereby retained in its entirety with the following amendments:

G2427.5.5.1 (503.5.6.1) Chimney lining. *Chimneys* shall be lined in accordance with NFPA 211.

~~**Exception:** Where an existing chimney complies with Sections G2427.5.5 through G2427.5.5.3 and its sizing is in accordance with Section G2427.5.4, its continued use shall be allowed where the *appliance* vented by that *chimney* is replaced by an *appliance* of similar type, input rating and efficiency.~~

(87) ***Section G2427.6.5 (503.6.6) Minimum height*** is hereby retained in its entirety with the following amendments:

G2427.6.5 (503.6.6) Minimum height. A Type B or L gas vent shall terminate at least 5 feet (1524 mm) in vertical height above the highest connected *appliance draft hood* or *flue collar*. A Type B-W gas vent shall terminate not less than 12 feet (3658 mm) in vertical height above the bottom of the wall *furnace*. All gas vents shall terminate a minimum of 22 inches (559 mm) above the surface or *grade* directly below.

(88) ***Section G2445 (621), Unvented Room Heaters***, is hereby deleted in its entirety.

~~**SECTION G2445 (621) UNVENTED ROOM HEATERS**~~

~~**G2445.1 (621.1) General.** *Unvented room heaters* shall be tested in accordance with ANSI Z 21.11.2 and shall be installed in accordance with the conditions of the listing and the manufacturer's installation instructions.~~

~~**G2445.2 (621.2) Prohibited use.** One or more *unvented room heaters* shall not be used as the sole source of comfort heating in a *dwelling unit*.~~

~~**G2445.3 (621.3) Input rating.** *Unvented room heaters* shall not have an input rating in excess of 40,000 *Btu*/h (11.7 kW).~~

~~**G2445.4 (621.4) Prohibited locations.** The location of *unvented room heaters* shall comply with Section G2406.2.~~

~~**G2445.5 (621.5) Room or space volume.** The aggregate input rating of all *unvented appliances* installed in a room or space shall not exceed 20 *Btu/*h per *cubic foot* (207 W/m3) of volume of such room or space. Where the room or space in which the *appliance* is installed is directly connected to another room or space by a doorway, archway or other opening of comparable size that cannot be closed, the volume of such adjacent room or space shall be permitted to be included in the calculations.~~

~~**G2445.6 (621.6) Oxygen-depletion safety system.** *Unvented room heaters* shall be equipped with an oxygen-depletion sensitive safety shutoff system. The system shall shut off the gas supply to the main and *pilot burners* when the oxygen in the surrounding atmosphere is depleted to the percent concentration specified by the manufacturer, but not lower than 18 percent. The system shall not incorporate field adjustment means capable of changing the set point at which the system acts to shut off the gas supply to the room heater.~~

~~**G2445.7 (621.7) Unvented decorative room heaters.** An unvented decorative room heater shall not be installed in a *factory-built fireplace* unless the *fireplace* system has been specifically tested, listed and labeled for such use in accordance with UL 127.~~

~~**G2445.7.1 (621.7.1) Ventless firebox enclosures.** Ventless firebox enclosures used with unvented decorative room heaters shall be listed as complying with ANSI Z21.91.~~

(89) A new ***Section G2447.6 (623.8) Kitchens with gas cooking*** is hereby added to read as follows:

G2447.6 Kitchens with gas cooking. Residential kitchens with gas cooking appliances shall be supplied with an exhaust system vented to the outside in accordance with section M1503. Ducts serving kitchen exhaust systems shall not terminate in an attic or crawl space or areas inside the building and shall not induce or create a negative pressure in excess of negative 3 Pa or adversely affect gravity-vented appliances.

(90) A new ***Section G2451.3 (630.3) Combustion and ventilation air*** is hereby added to read as follows:

G2451.3 (630.3) Combustion and ventilation air Where infrared heaters are installed, natural or mechanical means shall provide outdoor ventilation air at a rate of not less than 4 cfm per 1,000 Btu/h (0.38 m3/min/kW) of the aggregate input rating of all such heaters installed in the space. Exhaust openings for removing flue products shall be above the level of the heaters.

(91) ***Section P2903.2 Maximum flow and water consumption*** is hereby retained in its entirety with the following amendments:

P2903.2 Maximum flow and water consumption. The maximum water consumption flow rates and quantities for all plumbing fixtures and fixture fittings shall be in accordance with Table P2903.2 and such fixtures shall be Environmental Protection Agency (EPA)

WaterSense® labeled fixtures, excluding fixtures and fixture fittings that are not labeled under the WaterSense® program.

(92) ***Table P2903.2*** is hereby retained in its entirety with the following amendments:

Table P2903.2 Maximum Flow Rates and Consumption For Plumbing Fixtures and Fixture Fittings [b]

PLUMBING FIXTURE OR FIXTURE FITTING	MAXIMUM FLOW RATES
Lavatory faucet	~~2.2 gpm at 60 psi~~ 1.5 gpm at 60 psi
Shower head[a]	~~2.5 gpm at 80 psi~~ 1.8 gpm at 80 psi
Sink faucet	~~2.2 gpm at 60 psi~~ 1.8 gpm at 60 psi
Water closet	~~1.6 gallons per flushing cycle~~ 1.28 gallons per flushing cycle, with minimum MaP threshold of 600 grams. Dual flush gallons per flushing cycle: Average of three flushes (two reduced flushes and one full flush)

For SI: 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895kPa

a. A handheld shower spray is also a shower head

b. Consumption tolerances shall be determined from referenced standards.

(93) A new ***Section E3401.5 Electrical Vehicle Ready*** is hereby added to read as follows:

Section E3401.5 Electrical Vehicle Ready. All new single family *dwellings* with an attached garage or carport shall be provided with an empty conduit of 1/2 inch (12.7 mm) minimum, installed from the *dwellings* electrical panel board to a junction box in readily accessible location in the garage or carport, capable of supporting a 30 ampere 220 volt outlet.

(94) A new ***Section E3401.6 Photovoltaic Ready*** is hereby added to read as follows:

Section E3401.6 Photovoltaic Ready All new single family *dwellings* shall be provided with an empty metallic conduit of 3/4 inch (19.05 mm) minimum, installed from the *dwellings* attic space beneath the roof which most likely would support the majority of installed *photovoltaic system*, to a junction box located within 12 inches of the *dwellings* electrical meter or connected directly to the *dwellings* electrical panel board.

(95) ***Chapter 44 Referenced Standards*** is hereby retained in its entirety with the following amendments:

...

ANSI/ACCA QI 5-2007 *HVAC Quality Installation Specification.*
Referenced in Amended 2012 IRC Section M1309 Performance verification

Installation Masters™ Testing and Certification Program
Referenced in Amended 2012 IRC Section R703.8.1 Fenestration installation

CDPH California Department of Public Health
1615 Capitol Avenue
Sacramento, CA 95814
CDPH 01350 Standard Method for Testing VOC emissions from indoor sources
Referenced in Amended 2012 IRC Section R325.1 Low-volatile organic compound (VOC) materials.

FSC Forest Stewardship Council U.S. (FSC-US)
212 Third Avenue North, Suite 504
Minneapolis, MN 55401

GEI GREENGUARD Environmental Institute
2211 Newmarket Parkway, Suite 110
Marietta, GA 30067
GGPS.001.GREENGUARD IAQ Standard for *Building* Materials, Finishes and Furnishings
Referenced in Amended 2012 IRC Section R325.1 Low-volatile organic compound (VOC) materials.

Green Seal® 1001 Connecticut Avenue, NW
Suite 827
Washington, DC 20036-5525
GS-11 Paintings and Coatings
GS-43 Recycled Content Latex Paints
Referenced in Amended 2012 IRC Section R325.1 Low-volatile organic compound (VOC) materials.

HVI Home Ventilating Institute
1000 N Rand Rd, Ste 214
Wauconda, IL 60084 USA
HVI referenced standard HVI 915, Procedure for Loudness Rating of Residential Fan Products
Referenced in Amended 2012 IRC Section M1507.4.2.6. Sound ratings for fans.

IDA International Dark-Sky Association
3225 N. First Avenue
Tucson, Arizona 85719

IDA fixture seal of approval (FSA) third-party certification for luminaires that minimize glare, reduce light trespass, and don't pollute the night sky.

http://www.darksky.org/
http://www.darksky.org/outdoorlighting/mlo
http://www.darksky.org/outdoorlighting/about-fsa

RESNET® Mortgage Industry National Home Energy Rating Systems Standards
Residential Energy Services Network, Inc.

P.O. Box 4561
Oceanside, CA 92052-4561
http://resnet.us
RESNET® reference standard Grade I and Grade II Insulation
Referenced in Amended 2012 IRC Section N1102.2 Specific insulation requirements.
...

(96) ***APPENDIX E, MANUFACTURED HOUSING USED AS DWELLINGS***, is hereby adopted in its entirety.

(97) ***APPENDIX F, RADON CONTROL METHODS***, is hereby retained in its entirety with the following amendments:
...

AF101.1 General. This appendix contains requirements for all radon-resistant construction required for all new dwellings constructed under this code. ~~construction in *jurisdictions* where radon-resistant construction is required.~~

~~Inclusion of this appendix by *jurisdictions* shall be determined through the use of locally available data or determination of Zone 1 designation in Figure AF101 and Table AF101(1).~~

...

AF103.1 General. The following construction techniques are intended to resist radon entry and prepare the building for post-construction radon mitigation~~, if necessary (see Figure AF102). These techniques are required in areas where designated by the *jurisdiction*~~.

AF103.2 Subfloor preparation. A layer of gas-permeable material shall be placed under all concrete slabs and other floor systems that directly contact the ground and are within the walls of the living spaces of the building, to facilitate future installation of a subslab depressurization system, if needed. Each radon reduction vent pipe riser shall serve no more than 4000 square feet of uninterrupted under slab/floor area. The gas-permeable layer shall consist of one of the following:

1. A uniform layer of clean aggregate, not less than 4 inches (102 mm) thick. The aggregate shall consist of material that will pass through a 2-inch (51 mm) sieve and be retained by a 1/4-inch (6.4 mm) sieve.

2. A uniform layer of sand (native or fill), a minimum of 4 inches (102 mm) thick, overlain by a layer or strips of geotextile drainage matting designed to allow the lateral flow of soil gases.

3. Other materials, systems or floor designs with demonstrated capability to permit depressurization across the entire subfloor area.

~~**AF103.3 Soil-gas-retarder.** A minimum 6-mil (0.15 mm) [or 3-mil (0.075 mm) cross-laminated] polyethylene or equivalent flexible sheeting material shall be placed on top of the gas-permeable layer prior to casting the slab or placing the floor assembly to serve as a soil-gas-retarder by bridging any cracks that develop in the slab or floor assembly, and to prevent concrete from entering the void spaces in the aggregate base material. The sheeting shall cover the entire floor area with separate sections of sheeting lapped at least 12 inches (305 mm). The sheeting shall fit closely around any pipe, wire or other penetrations of the material. All punctures or tears in the material shall be sealed or covered with additional sheeting.~~

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AF103.5 Passive submembrane depressurization system.
In buildings with crawl space foundations, the following components of a passive submembrane depressurization system shall be installed during construction.

~~**Exception:** Buildings in which an *approved* mechanical crawl space ventilation system or other equivalent system is installed.~~

~~**AF103.5.1 Ventilation.** Crawl spaces shall be provided with vents to the exterior of the building. The minimum net area of ventilation openings shall comply with Section R408.1.~~

~~**AF103.5.2 Soil-gas-retarder.** The soil in crawl spaces shall be covered with a continuous layer of minimum 6-mil (0.15 mm) polyethylene soil-gas-retarder. The ground cover shall be lapped a minimum of 12 inches (305 mm) at joints and shall extend to all foundation walls enclosing the crawl space area.~~

AF103.5.2 Soil-gas-retarder. The soil in crawl spaces shall be covered with a continuous layer of minimum 6-mil (0.15 mm) polyethylene or 3 mil (0.75 mm) cross laminated polyethylene soil gas retarder. The ground cover shall be lapped not less than 12 inches at joints and sealed or taped. The edges of the ground cover shall extend a minimum of 12 inches (152 mm) up onto all foundation walls enclosing the under-floor space and be sealed to the wall and any footing pads. 6 mil polyethylene shall also be sealed and mechanically fastened to the wall. An interior perimeter drain tile loop shall be connected to a plumbing tee or other approved connection as per AF103.5.3.

AF103.13 Provisions for future depressurization fan installation. Permanent provisions shall be made for the future installation of an in-line fan to be connected to every radon vent pipe. Such designated fan locations shall be outside of the conditioned envelope of the building, such as in the attic, garage and similar locations, excluding crawl spaces and other interior under-floor spaces. Designated locations shall accommodate an unobstructed permanent cylindrical space with the following minimum dimensions: 12 inches (305 mm) measured radially around the radon vent pipe along a vertical distance of 30 inches (760 mm). Designated fan locations shall be permanently accessible for servicing and maintenance. An electrical receptacle outlet shall be provided within 4 feet

(1.219 m) of and within sight from designated fan locations and installed so as to not be covered by insulation. A light fixture shall be installed in the area of future fan location.

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SECTION AF 102 DEFINITIONS

~~**SOIL-GAS-RETARDER.** A continuous membrane of 3-mil (0.075 mm) cross-linked polyethylene or other equivalent material used to retard the flow of soil gases into a building.~~

SOIL-GAS-RETARDER. A continuous membrane of 6-mil (0.15 mm) polyethylene, 3-mil (0.075 mm) cross-laminated polyethylene or other equivalent material used to retard the flow of soil gases into a building.

(98) ***APPENDIX H, PATIO COVERS***, is hereby adopted in its entirety.

(99) ***APPENDIX M, HOME DAY-CARE R-3 OCCUPANCIES***, is hereby adopted in its entirety.

(100) ***APPENDIX Q, TINY HOUSES***, is hereby adopted in its entirety.

Section 4. The City Attorney and the City Clerk are authorized to modify the formatting and to make such other amendments to this Ordinance as necessary to facilitate publication in the Fort Collins Municipal Code; provided, however, that such modifications and amendments shall not change the substance of the Code provisions.

Introduced, considered favorably on first reading, and ordered published this 18th day of December, A.D. 2018, and to be presented for final passage on the 2nd day of January, A.D. 2019.

Mayor

ATTEST:

City Clerk

CITY OF FORT COLLINS SEAL COLORADO

Passed and adopted on final reading on the 2nd day of January, A.D. 2019.

Mayor

ATTEST:

City Clerk

NOTICE OF PUBLIC HEARING

NOTICE is hereby given of a public hearing to be held before the City Council of the City of Fort Collins, Colorado, on the 4th day of December, A.D., 2018 at 6:00 p.m., or as soon thereafter as the matter may come on for hearing, in the Council Chambers at the City Hall, 300 LaPorte Avenue, Fort Collins, Colorado for the purpose of considering the adoption of ordinances adopting by reference the *2018 International Building Code, 2018 International Residential Code, 2018 International Energy Conservation Code, 2018 International Mechanical Code,* and the *2018 International Fuel Gas Code, 2018 International Existing Building Code,* and the *2018 International Pool and Spa Code,* together with local amendments, promulgated by the International Code Council.

Not less than one (1) copy of said Codes has been, and now is on file in the Office of the City Clerk of the City of Fort Collins and is available for public inspection.

The purpose of the International Building Code, International Residential Code, International Energy Conservation Code, International Mechanical Code, the International Fuel Gas Code, 2018 International Existing Building Code, and the 2018 International Pool and Spa Code adopted by said ordinance is to provide for protection of public health and safety and general welfare.

The City of Fort Collins will make reasonable accommodations for access to City services, programs and activities and will make special communication arrangements for persons with disabilities. Please call 221-6515 (V/TDD: Dial 711 for Relay Colorado) for assistance.

This notice is given and published by order of the City of Fort Collins, Colorado.

Dated at Fort Collins, Colorado this 18th day of November, A.D. 2018.

Delynn Coldiron
City Clerk