October 27, 2015

RESOLUTION 2015-104

A resolution approving the adoption of the 2015 editions of the International Codes, along with deletions and amendments, as the Boulder County Building Code for application within the unincorporated area of Boulder County

Recitals

A. The Board of County Commissioners is authorized by Resolution to alter and amend the Boulder County Building Code, pursuant to Title 30, Article 28, Section 204 of the Colorado Revised Statutes.

B. The Board of County Commissioners held a duly advertised public hearing on November 3, 2015, and adopted proposed Commissioners Resolution 2015-104 approving the 2015 Amendments to the Boulder County Building Code.

C. This Resolution shall be known as the "Boulder County Building Code," may be cited as such and will be referred to herein as "this code."

D. This code provides minimum standards to safeguard life or limb, health, property and public welfare by regulating the design, construction, quality of materials, use, occupancy and location of all construction or alteration of dwellings, buildings and structures together with fuel gas, plumbing, mechanical and electrical installations in all parts of Boulder County not including areas embraced within the limits of any incorporated city or town.

E. The purpose of this code is to provide for and promote the health, safety and welfare of the general public.

F. The provisions of this code shall apply to the erection, construction, reconstruction, alteration, remodeling, renovation or the change of use of all dwellings, buildings and structures including buildings or structures used for the purpose of providing shelter for agricultural implements, farm products, livestock, or poultry within the unincorporated territory of Boulder County, and shall include the authority over existing buildings and structures provided in the *International Building Code* and the *International Existing Building Code*.

G. Pursuant to Title 30, Article 28, Section 205 of the Colorado Revised Statutes, the County Building Inspector, also referred to herein as the "building official," as authorized in Title 30, Article 28, Section 114 of the Colorado Revised Statutes, shall be authorized by the Board of County Commissioners to administer and enforce this code; and

H. The Land Use Director shall be responsible for enforcing and administering this code in the event of the absence or disability of the building official; and

I. Upon the adoption of this code, the Board of County Commissioners shall file certified copies thereof in its office, which copies shall be accessible to the public at a cost not to exceed that of printing the same. Copies of this code printed by authority of the Board of County Commissioners shall be prima facia evidence of the original text in all courts and tribunals of this state.

Therefore, the Board resolves:

The Boulder County Building Code, as adopted in Board of County Commissioners in Resolution 2015-104, shall read as follows:

REFER TO EXHIBIT "A," ATTACHED AND INCORPORATED

EXHIBIT "A" TO COMMISSIONERS RESOLUTION ~~2012-50~~ 2015-104
ADOPTION OF MODEL CODES BY REFERENCE,
WITH DELETIONS AND AMENDMENTS

The following publications shall hereby be adopted as the Boulder County Building Code by reference ~~thereto~~, with deletions and amendments as indicated.

1. **~~2012~~ 2015 INTERNATIONAL BUILDING CODE (the "IBC"),** including specifically **Appendix Chapters C, I, ~~and~~ J and K;**

2. **~~2012~~ 2015 INTERNATIONAL RESIDENTIAL CODE (the "IRC"),** including specifically **Appendix** Chapters E, F, ~~G, and~~ H, R and S;

3. **2015 INTERNATIONAL EXISTING BUILDING CODE (the "IEBC");**

4. **~~2012~~ 2015 INTERNATIONAL MECHANICAL CODE (the "IMC");**

5. **~~2012~~ 2015 INTERNATIONAL PLUMBING CODE (the "IPC");**

6. **~~2012~~ 2015 INTERNATIONAL FUEL GAS CODE (the "IFGC");**

7. **CURRENT VERSION ADOPTED BY THE COLORADO STATE ELECTRICAL BOARD OF THE NATIONAL ELECTRICAL CODE (the "NEC");**

8. **~~2012~~ 2015 INTERNATIONAL ENERGY CONSERVATION CODE (the "IECC");**

9. **~~2012~~ 2015 INTERNATIONAL GREEN CONSTRUCTION CODE (the "IgCC"), selected portions;**

10. **~~2012~~ 2015 INTERNATIONAL CODE COUNCIL PERFORMANCE CODE (the "ICCPC");** and the

11. **2015 INTERNATIONAL SWIMMING POOL AND SPA CODE (the "ISPSC");**

all, except the NEC, as published by the International Code Council (ICC), 4051 West Flossmoor Road, Country Club Hills, IL 60478-5795; and the NEC, as published by the National Fire Protection Association, One Batterymarch Park, Quincy, MA 02169-7471; with additions, deletions and amendments as follows:

Amendments to the Boulder County Building Code

Amendments to the ~~2012~~ 2015 International Building Code ("IBC")

Add the adoption of Appendix K to provide administrative provisions for the National Electrical Code ("NEC").

Note: The editorial arrangement of IBC Chapter 1 and Chapter 1 of the ten other model codes being adopted will be finalized based upon which arrangement will best serve our customers. The options remain to combine all into one "Boulder County Building Code" Chapter 1 or to individually amend each Chapter 1, albeit with some identical amendments, like the right of entry and liability provisions being amended in conformance with Colorado law.

~~2012~~ **2015 International Building Code**, including specifically Appendix Chapters C, I~~, and~~ J and K, published by the International Code Council (ICC) with additions, deletions, and amendments as follows:

IBC CHAPTER 1
SCOPE AND ADMINISTRATION

PART 1—SCOPE AND APPLICATION

IBC SECTION 101
GENERAL

101.1 Title. These regulations shall be known as the *Boulder County Building Code* ~~of [NAME OF JURISDICTION]~~, hereinafter referred to as "this code."

101.4 Referenced codes. The other codes listed in Sections 101.4.1 through ~~101.4.7~~ 101.4.11 and referenced elsewhere in this code shall be considered part of the requirements of this code to the prescribed extent of each such reference.

101.4.3 Plumbing. The provisions of the *International Plumbing Code* shall apply to the installation, *alteration*, *repair* and replacement of plumbing systems, including equipment, appliances, fixtures, fittings and appurtenances, and where connected to a water or sewage system and all aspects of a medical gas system. ~~The provisions of the *International Private Sewage Disposal Code* shall apply to private sewage disposal systems.~~

101.4.4 Property maintenance. The *International Property Maintenance Code* is not adopted. ~~The provisions of the *International Property Maintenance Code* shall apply to existing structures and premises; equipment and facilities; light, ventilation, space heating, sanitation, life and fire safety hazards; responsibilities of *owners*, operators and occupants; and occupancy of existing premises and structures.~~

101.4.5 Fire prevention. The *International Fire Code* is not adopted, but may be adopted by county fire protection districts in accordance with C.R.S. § 32-1-1002(1)(d). The provisions of the *International Fire Code* shall apply to matters affecting or relating to structures, processes and premises from the hazard of fire and explosion arising from the storage, handling or use of structures, materials or devices; from conditions hazardous to life, property or public welfare in the occupancy of structures or premises; and from the construction, extension, *repair*, *alteration* or removal of fire suppression, *automatic sprinkler systems* and alarm systems or fire hazards in the structure or on the premises from occupancy or operation.

101.4.8 Electrical. The provisions of the *National Electrical Code*, as adopted by the Colorado State Electrical Board, shall apply to the installation, *alterations*, *repairs* and replacement of electrical systems, including the installation of electrical conductors, equipment, and raceways; signaling and communications conductors, equipment and raceways; and optical fiber cables and raceways. The administrative provisions of IBC Appendix Chapter K shall apply to electrical systems and equipment.

101.4.9 Green construction. The provisions of the *International Green Construction Code* shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located for new buildings, existing building additions, and alterations to existing buildings or complexes of buildings on the same property with over 25,000 square feet in total building floor area.

101.4.10. Performance. The provisions of the *International Code Council Performance Code* shall apply only for use as a guide and a tool to evaluate proposals for modifications and for alternate materials, design and methods of construction and equipment in accordance with Sections 104.10 and 104.11, respectively, of the IBC, IRC and IEBC, and other sections, as applicable, of the other adopted codes.

101.4.11. Swimming pools and spas. The provisions of the *International Swimming Pool and Spa Code* shall apply to the construction, alteration, movement, renovation, replacement, repair and maintenance or use of aquatic recreation facilities, pools and spas.

IBC SECTION 102
APPLICABILITY

102.2 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

There are hundreds of floodplain requirements interwoven into the International Codes. Boulder County's floodplain requirements are located in Section 4-400 of the Boulder County Land Use Code and are administered by the Boulder County Transportation Department. The new section below is intended to deal with any conflicts between the two and make it clear that the county's floodplain requirements apply.

102.2.1 Flood hazard areas. Where conflicts occur between any provisions of this code and Section 4-400 of the Boulder County Land Use Code, "Floodplain Overlay District," the provisions of Section 4-400 of the Boulder County Land Use Code shall apply.

102.6 Existing structures. The legal occupancy of any structure existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code, the *International Existing Building Code*~~, the *International Property Maintenance Code*~~ or the *International Fire Code*.

102.6.1 Buildings not previously occupied. A building or portion of a building that has not been previously occupied or used for its intended purpose in accordance with the laws in existence at the time of its completion shall comply with the provisions of the *International Building Code* or *International Residential Code*, as applicable, for new construction or with any current permit for such occupancy.

102.6.2 Buildings previously occupied. The legal occupancy of any building existing on the date of adoption of this code shall be permitted to continue without change, except as otherwise specifically provided in this code~~,~~ or the *International Fire Code* ~~or *International Property Maintenance Code*,~~ or as is deemed necessary by the *building official* for the general safety and welfare of the occupants and the public.

PART 2—ADMINISTRATION AND ENFORCEMENT

IBC SECTION 103
DIVISION OF BUILDING SAFETY & INSPECTION SERVICES

103.1 Creation of enforcement agency. The Building Safety and Inspection Services Division is hereby created and the official in charge ~~thereof~~ shall be known as the *building official*.

103.3 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*. ~~For the maintenance of existing properties, see the *International Property Maintenance Code.*~~

IBC SECTION 104
DUTIES AND POWERS OF BUILDING OFFICIAL

Note: Retain this existing amendment, as it gives clear direction on right of entry in accordance with Colorado law, and also have it apply for the right of entry provisions for all of the model codes that are being adopted. Delete Section 104.6 of the published IBC and replace it as follows:

104.6 Right of Entry. When the building official or his authorized representative has reasonable cause to believe that a violation of this code is likely to exist in a structure or upon a premises and that entry into the structure or upon the premises is necessary to verify the violation, the building official or his authorized representative shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises, or portion thereof desired to be inspected, and request consent to enter and inspect. If such person cannot be located or if entry is refused, the building official or his authorized representative may seek entry by submitting a sworn affidavit to the proper court of jurisdiction, setting forth facts sufficient to support a reasonable belief that the violation is likely to exist, and that further investigation of the structure or premises is warranted. Any subsequent entry and inspection shall be conducted in accordance with an administrative search warrant if issued by the court. The foregoing provisions of this subsection notwithstanding, consent to enter or an administrative search warrant shall not be required in the following circumstances:

1. To conduct inspections during regular county business hours under an applied for or issued building permit, for work authorized under that permit prior to the issuance of a final Certificate of Occupancy.
2. To make observations of the structure or premises in plain view from public property or from portions of the structure or premises which are open or accessible to the public, or in which the owner or occupant otherwise lacks a reasonable expectation of privacy.
3. In emergency situations in which the building official or his authorized representative has reason to believe that the public health or safety is in imminent danger and could be jeopardized by any delay in securing entry.

Note: Retain the existing amended liability provisions in our current amendments, as they include a reference to the Colorado Governmental Immunity Act, C.R.S. §24-10-101, and also have it apply for the liability provisions for all of the model codes that are being adopted. Delete Sections 104.8 and 108.4.1 and replace them as follows:

104.8 Liability. This code shall not be construed to relieve or lessen the responsibility of any person owning, operating or controlling any building or structure in the unincorporated area of Boulder County for any damages or injuries to persons or property caused in whole or in part by defects or other conditions which may be subject to inspection or regulation under this code. Neither Boulder County, the Boulder County Board of County Commissioners, the Boulder County Land Use Department or any division thereof, the building official, or any other employee or authorized representative of Boulder County who is charged or connected with the enforcement of this code, shall be liable in damages for any act or omission in the course or context of the discharge of duties under this code or any provisions related to it, and nothing in this code or in its administration or enforcement shall be considered in any way to be a waiver by Boulder County or any of its officials or employees of the protection to which they are entitled under the Colorado Governmental Immunity Act, C.R.S. §24-10-101, et seq., as amended. Any claim or suit brought against the building official or any other employee or authorized representative of Boulder County which is alleged to have arisen out of or as a result of any act or omission in the enforcement of any provision of this code, and which occurred within the scope of employment of such official, employee or representative, shall be defended by Boulder County until final termination of such proceedings, and any judgment resulting there from shall be assumed by Boulder County.

104.10 Modifications.

Insert subsection on use of Performance Code as a tool and a guide.

> **104.10.2 Performance code.** The provisions of the *ICC Performance Code for Buildings and Facilities* may be used by the *building official* as a guide and a tool to evaluate proposals for modifications.

104.11 Alternative materials, design and methods of construction and equipment.

Insert subsection on use of Performance Code as a tool and a guide.

104.11.3 Performance code. The provisions of the *ICC Performance Code for Buildings and Facilities* may be used by the *building official* as a guide and a tool to evaluate proposals for alternative materials, design and methods of construction and equipment.

IBC SECTION 105
PERMITS

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

Note: The following exemptions from building permits are as they exist in our current 2012 amendments, unless they are stricken by a ~~double strike-through~~ (deletion) or double underlined (addition). The default for changes is to either match the Boulder County Land Use Code or use the wording in the published 2015 IBC.

Building:

1. One-story detached accessory structures used as a storage shed, playhouse for private use, greenhouse, chicken coop, agricultural loafing shed, or similar uses, provided:

   a. the floor area of any structure does not exceed 120 square feet (11 m2), except agricultural loafing sheds, which may not exceed 200 square feet.
   b. the structure height does not exceed 12 feet,
   c. the structure does not have any utilities, and
   d. the structure does not violate the conditions of any existing land use approval or conservation easement.
   e. The number of allowed detached accessory structures which may be constructed without a building permit shall be determined by the size of the subject parcel:
      i. One detached accessory structure may be constructed without a building permit on parcels 0.5 acres or less in size.
      ii. Two detached accessory structures may be constructed without a building permit on parcels greater than 0.5 acre and less than ten acres.
      iii. Three detached accessory structures may be constructed without a building permit on parcels 10 acres and larger.

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

3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.

4. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.

5. ~~Platforms,~~ S~~s~~idewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and are not part of an *accessible route* and not subject to a grading permit.

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

7. Temporary motion picture, television and theater stage sets and scenery.

8. Prefabricated *swimming pools* ~~where the pool walls are entirely above the adjacent grade and the capacity does not exceed 5,000 gallons~~ accessory to a Group R-3 occupancy that are less than 24 inches (610 mm) deep, are not greater than 5,000 gallons (18 925 L) and are installed entirely above ground.

9. Shade cloth structures constructed for nursery or agricultural purposes, not including service systems.

10. Swings and other playground equipment accessory to detached one- and two-family *dwellings*.

11. Window awnings in Group R-3 and U occupancies, 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.

12. Nonfixed and movable fixtures, cases, racks, counters and partitions not over 5 feet 9 inches (1753 mm) in height.

13. Antennas and/or their supporting structures other than buildings, accessory to residential use less than ten feet in height and lower than the structure height limit in the zoning district in which located, or which were constructed or erected prior to July 1, 1988.

14. Temporary emergency noncommercial telecommunication-sites operated by a governmental agency, or by a volunteer public safety agency officially sanctioned by a governmental agency for that purpose, for public safety communication uses, for a period not to exceed six months.

Electrical:

Repairs and maintenance: Minor repair work, including the replacement of lamps or the connection of *approved* portable electrical equipment to *approved* permanently installed receptacles.

Radio and television transmitting stations: The provisions of this code shall not apply to electrical equipment used for radio and television transmissions, but do apply to equipment and wiring for a power supply and the installations of towers and antennas.

Temporary testing systems: A *permit* shall not be required for the installation of any temporary system required for the testing or servicing of electrical equipment or apparatus.

Gas:

1. Portable heating appliance.

2. Replacement of any minor part that does not alter approval of equipment or make such equipment unsafe.

Mechanical:

1. Portable heating appliance.

2. Portable ventilation equipment.

3. Portable cooling unit.

4. Steam, hot or chilled water piping within any heating or cooling equipment regulated by this code.

5. Replacement of any part that does not alter its approval or make it unsafe.

6. Portable evaporative cooler.

7. Self-contained refrigeration system containing 10 pounds (4.54 kg) or less of refrigerant and actuated by motors of 1 horsepower (0.75 kW) or less.

Plumbing:

1. The stopping of leaks in drains, water, soil, waste or vent pipe, provided, however, that if any concealed trap, drain pipe, 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.

IBC SECTION 106
FLOOR AND ROOF DESIGN LOADS

~~**106.1** Live Loads Posted. Where the live loads for which each floor or portion thereof of a commercial or industrial building is or has been designed to exceed 50 psf, such design live loads shall be conspicuously posted by the owner in that part of each story in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.~~

~~Add exceptions to clarify that the live load posting requirements do not apply to other than commercial or industrial buildings.~~

~~**Exceptions:**~~

~~**1.** Group U occupancies.~~

~~**2.** One- and two-family dwellings and townhouses.~~

~~**3.** Residential accessory structures as defined in Section R202 of the International Residential Code.~~

Note: The 3 exceptions above that were previously added as amendments no longer appear to be necessary. The highlighted 2015 IBC language below makes it clear that this requirement applies only to commercial or industrial buildings. The result will be no amendment to this section.

106.1 Live loads posted. In commercial or industrial buildings, for each floor or portion thereof designed for *live loads* exceeding 50 psf (2.40 kN/m2), such design *live loads* shall be conspicuously posted by the owner or the owner's authorized agent in that part of each *story* in which they apply, using durable signs. It shall be unlawful to remove or deface such notices.

IBC SECTION 107
SUBMITTAL DOCUMENTS

107.2.5 Site plan. The *construction documents* submitted with the application for *permit* shall be accompanied by a site plan showing to scale the size and location of new construction and existing structures on the site, distances from *lot lines*, the established street grades and the proposed finished grades and, as applicable, *flood hazard areas*, *floodways*, and *design flood elevations*; and it shall be drawn in accordance with an accurate boundary line survey. In the case of demolition, the site plan shall show construction to be demolished and the location and size of existing structures and construction that are to remain on the site or plot. The *building official* is authorized to waive or modify the requirement for a site plan where the application for *permit* is for *alteration* or *repair* or where otherwise warranted.

107.2.5.1 Design flood elevations. Where *design flood elevations* are not specified, they shall be established in accordance with Section 1612.3.1.

<u>107.2.5.2</u> Site Plans in Hillside Areas. When a building site is located in a hillside area and, in the opinion of the building official, is located in an area subject to geologic hazards the building official may require that a detailed site plan be submitted as a prerequisite to the issuance of a building permit. Such site plans, when required, shall be prepared by an architect or a civil engineer and shall be based on an accurate topographic map prepared by a land surveyor. The site plans shall bear the seal and signature of the responsible architect or civil engineer and the land surveyor. The topographic map shall encompass the building site and shall be drafted at a scale no smaller than 1 inch equal to 20 feet (1:240) and at a contour interval less than or equal to two (2) feet. Such site plans, at a minimum, shall show:

1. A grading plan showing existing and proposed contour lines reflecting the proposed grading as well as the locations and pertinent elevations of finished floors of all structures, basements, driveways, level areas, septic disposal fields and retaining walls.

2. The locations of all water wells (whether on-site or off) within 250 feet of any septic disposal field.

3. All property lines within 100 feet of the building site.

4. Setbacks of cut slopes, fill slopes, retaining walls, and structures from property lines.

5. At least one critical cross section oriented through the structural site and drafted at equal horizontal and vertical levels.

107.2.6 Structural information. The *construction documents* shall provide the information specified in Section 1603.

Note: Retain existing amendment regarding water and sanitation requirements with some minor editorial changes.

107.2.7 Water and Sanitation Requirements. Every building or addition thereto shall be provided with water and sanitation facilities in accordance with the provisions of this code. Water supplies and sewerage facilities shall be in conformance with regulations and requirements of the Boulder County Public Health Department, Colorado Department of Public Health and Environment and the Colorado Division of Water Resources ~~Office~~ or any supplier recognized thereby. When applicable, evidence of same shall be submitted to the building official prior to the issuance of the building permit.

Note: This existing amendment is proposed to be moved from Section 107.7 of the 2012 amendments to a more appropriate location. If it is determined that the 2015 published code contains equivalent provisions, it may be deleted.

107.2.7 Reports. When, in the opinion of the building official, certain geologic hazards or constraints, including but not limited to, landslides, rock falls, flash flooding, mudslides, avalanches, subsidence and/or soil creep exist or may exist with respect to a specific building proposal, a soil and/or geologic investigation may be required prior to the issuance of a building permit. Such investigation, when required, shall be documented by submittal to the building official of an acceptable written report which is signed by a soils engineer and/or an engineering geologist within his field of expertise. Said report(s) shall contain specific recommendations regarding the building location and design. The relationships of (1) site grading, structural integrity, and septic drain fields and (2) the geologic hazards or constraints shall be considered in the report(s).

IBC SECTION 109
FEES

Fees are adopted separately and updated from time to time by the Board of County Commissioners. There is also an existing separate publication which lists the fees. Amend Section 109.2 to read as follows:

109.2 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~~ Boulder County Board of County Commissioners in a separate adopting resolution. For building permit, plan review, grading permit and other fees, please refer to the Boulder County Land Use Department publication, "Boulder County Building Permit Fees."

The remainder of Section 109 is adopted as published.

IBC SECTION 110
INSPECTIONS

110.1 General. Construction or work for which a *permit* is required shall be subject to inspection by the *building official* and such construction or work shall remain accessible and exposed for inspection purposes until *approved*. Approval as a result of an inspection shall not be construed to be an approval of a violation of the provisions of this code or of other ordinances of the jurisdiction. Inspections presuming to give authority to violate or cancel the provisions of this code or of other ordinances of the jurisdiction shall not be valid. It shall be the duty of the *owner* or the owner's authorized agent to cause the work to remain accessible and exposed for inspection purposes. Neither the *building official* nor the jurisdiction shall be liable for expense entailed in the removal or replacement of any material required to allow inspection.

110.2 Preliminary inspection. Before issuing a *permit*, the *building official* is authorized to examine or cause to be examined buildings, structures and sites for which an application has been filed.

110.3 Required inspections. The *building official*, upon notification, shall make the inspections set forth in Sections 110.3.1 through 110.3.10. Please refer to the Boulder County Land Use Department publication, "Required Inspections and Procedures" for specific inspection requirements.

The remainder of Section 110 is adopted as published.

IBC SECTION 113
BOARD OF ~~APPEALS~~ REVIEW

Amend this section to include the statutory provisions of C.R.S. 30-28-206 and 30-28-207, which are included in the existing amendments, as well as usable portions of the published IBC Section 113.

113.1 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~~ review. The board of ~~appeals~~ review shall be appointed by the applicable governing authority and shall hold office at its pleasure. The board shall adopt rules of procedure for conducting its business.

113.2 Appeals. Appeals to the Board of Review may be taken by a person aggrieved by his inability to obtain a building permit or by an officer or department, board, or bureau of the County affected by the grant or refusal of the building permit because of non-compliance with the Boulder County Building Code. Any person, officer or department, board or bureau may appeal to the Board of Review from the decision of any enforcement of the provisions of the Building Code. Such appeals must be made within fourteen (14) days from the date of grant or refusal of the building permit or administrative decision. Such appeals shall be in writing directed to the Secretary of the Board of Review and shall state the basis for appeal.

113.3 Interpretations, Alternate Materials and Methods of Construction and Modifications. The Board of Review, in appropriate cases and subject to appropriate principles, standards, rules, conditions, and safeguards set forth in the building code may make interpretations of the terms of the building code in harmony with their general purpose and intent. The Board of Review may also approve of alternate materials or methods of construction or modifications provided the Board finds that the alternate material or method of construction or modification meets the standards found under Sections 104.10 and 104.11 of this code.

~~113.2~~ 113.4 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 relative to interpretation of the administrative provisions of this code and shall not have authority to waive requirements of this code.

113.5 Amendments to the Code. The Board of Review is authorized to formulate suggested amendments to the Building Code for consideration of the Board of County Commissioners.

113.6 Additional Authority. The Board of Review may adopt substantive rules and regulations based upon the provisions of the Building Code adopted by the Board of County Commissioners. In no case, however, shall these rules become effective unless the Board of Review thereon has conducted a public hearing. Notice of the hearing stating its time and place and where the text of the proposed substantive rules and regulations may be inspected shall be given in the same manner as provided in the initial adoption of the code.

~~113.3~~ 113.7 Qualifications. The board of ~~appeals~~ review shall consist of members who are qualified by experience and training to pass on matters pertaining to building construction and are not employees of the jurisdiction.

IBC SECTION 117
CONTRACTOR LICENSING

Similar to fees, these provisions are adopted separately and are contained in a separate publication.

117.1 General. The contractor licensing provisions of Boulder County are adopted by the Board of County Commissioners under a separate adopting resolution. Please refer to the Boulder County Land Use Department publication, "Boulder County Contractor License" for details.

IBC CHAPTER 2
DEFINITIONS

Note: The additional definitions in the existing 2012 amendments are proposed to be deleted, retained or modified as follows:

ARCHITECT. Architect is a person licensed under the provisions of Title 12, Article 4, CRS.

~~**BUILDING CODE.** Building Code is the Boulder County Building Code with deletions and amendments as adopted by the Boulder County Board of County Commissioners.~~

BUILDING SITE. Building Site is all that area or those areas encompassed by horizontal radii of 150 feet measured outwardly from exterior structural walls, water wells, of the limits of artificial grading, on-site sewage disposal systems, or slope retaining devices, except where limited by the parcel.

CIVIL ENGINEER. Civil Engineer is a person licensed under the provisions of Title 12, Article 25, Part I, CRS, and who is experienced and knowledgeable in the practice of civil engineering.

CIVIL ENGINEERING. Civil Engineering is the application of the knowledge of the forces of nature, principles of mechanics, and the properties of materials to the evaluation, design, and construction of civil works for the beneficial uses of mankind.

COUNTY GEOLOGIST. County Geologist is either (1) a staff member employed by the County under the Class Title Geologist and who performs the duties assigned there under or (2) any geologist who may be retained by the County to perform the duties of said Class Title. In either case, the County Geologist shall be a professional geologist as defined in 34-1-201 CRS.

~~**ENERGY CODE.** Energy Code is the International Energy Conservation Code and IRC Chapter 11 promulgated by the International Code Council as adopted by this jurisdiction.~~

ENGINEERING GEOLOGIST. Engineering Geologist is a professional geologist as defined in 34-1-201 CRS, and who is experienced and knowledgeable in the practice of engineering geology.

ENGINEERING GEOLOGY. Engineering Geology is the application of geologic knowledge and principles in the investigation and evaluation of naturally occurring rock and soil for use in the design of civil works for the purpose of assuring that geological features and processes affecting the planning, location, design, construction, operation and maintenance of civil works are recognized and adequately interpreted.

~~**FUEL GAS CODE.** Fuel Gas Code is the International Fuel Gas Code and IRC Chapter 24 as promulgated by the International Code Council.~~

HILLSIDE AREA. Hillside Area is an area ~~in the county~~ which exhibits a predominant ground slope with a gradient of five (5) horizontal to one (1) vertical or steeper (20% or steeper).

LAND SURVEYOR. Land Surveyor is a person licensed under the provisions of Title 12, Article 25, Part 2, CRS.

MANUFACTURED HOME. Manufactured Home shall mean manufactured home as defined in the Boulder County Land Use Code.

~~**MECHANICAL CODE.** Mechanical Code is the International Mechanical Code and IRC Chapters 12 through 23 promulgated by the International Code Council.~~

~~**PLUMBING CODE.** Plumbing Code is the International Plumbing Code or IRC Chapters 25 through 32 promulgated by the International Code Council.~~

SOIL ENGINEER. Soil Engineer is a person licensed under the provisions of Title 12, Article 25, Part 2, CRS, and who is experienced and knowledgeable in the practice of soil engineering.

SOIL ENGINEERING. Soil Engineering is the application of the principles of soil mechanics in the investigation, evaluation and design of civil works involving the use of earth materials and the inspection and testing of the construction thereof.

~~**RESIDENTIAL CODE.** Residential Code is the International Building Code and the International Residential Code promulgated by the International Code Council as applicable per Section 101.2.~~

IBC CHAPTER 7
FIRE AND SMOKE PROTECTION FEATURES

SECTION 723
REQUIREMENTS BASED ON LOCATION IN WILDFIRE ZONES

723.1. General. Unless ~~other~~ more restrictive requirements, such as those imposed through ~~Site Plan Review~~ review and approval processes required by the Boulder County Land Use Code, apply, the ignition-resistant construction and defensible space requirements of Section ~~R325~~ R327 of ~~this code~~ the amendments to the IRC shall be applicable to all new buildings, additions and repairs.

IBC CHAPTER 15
ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

SECTION 1503
WEATHER PROTECTION

Note: Add the same sentence from the existing 2012 amendments to the same IBC section, with some minor changes. (Note that the maximum hourly rainfall rate during the September 2013 extreme rainfall event did not exceed about 2.1" to 2.25" and these heaviest hourly rainfall rates were either at the Justice Center or immediately north and west of Boulder.)

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503 of this code and Sections 1106 and 1108, as applicable, of the *International Plumbing Code*. The 100-year, 1-hour rainfall rate to be used to size roof drainage components ~~in unincorporated Boulder County~~ shall be 2.4 inches per hour.

IBC SECTION 1505
FIRE CLASSIFICATION

IBC TABLE 1505.1[a, b, d]
MINIMUM ROOF COVERING CLASSIFICATION
FOR TYPES OF CONSTRUCTION

Add a new footnote designation to table heading and text as follows:

d. For roof coverings in Wildfire Zones, see Section~~s~~ R327.4.1 and R327.5.1 ~~4.2 and R325.8.1.~~ of the amendments to the IRC.

IBC CHAPTER 16
STRUCTURAL DESIGN

IBC SECTION 1608
SNOW LOADS

1608.2 Ground snow loads.

Note: Add a sentence to the end of the paragraph, as follows:

Snow loads shall be determined by the building official utilizing the Boulder County ~~Snow Load M~~ map, ~~entitled~~ "Colorado Front Range Gust Map and Snow Load Design Data for Colorado," as amended.

IBC SECTION 1609
WIND LOADS

1609.3 ~~Basic~~ Ultimate Design Wind Speeds.

Note: Add a sentence to the end of the first paragraph. It may be necessary to add a wind speed and conversion table similar to IBC Table 1609.3.1, only in accordance with the report, "Colorado Front Range Gust map – ASCE 7-10 Compatible," dated November 18, 2013 by Jon A. Peterka, or revise the wind speed figures on the existing map to correlate with ASCE 7-10 and the report.

The basic nominal design wind speed, in miles per hour (~~V3s~~ V_{asd}), for the determination of wind loads, shall be taken from the Boulder County ~~Wind Pressure M~~ map, ~~entitled~~ "Colorado Front Range Gust Map and Snow Load Design Data for Colorado," as amended.

IBC CHAPTER 18
FOUNDATIONS AND RETAINING WALLS

IBC SECTION 1803
GEOTECHNICAL INVESTIGATIONS

Delete the existing amendment. IBC Sections 1803 and 1805 contain ample provisions for geotechnical reports, the determination of groundwater levels and the provision of drain systems.

IBC SECTION 1805
DAMPPROOFING AND WATERPROOFING

1805.5 Gutters and downspouts. Gutters, downspouts, and downspout extensions are required on all buildings ~~in unincorporated Boulder County~~.

Exceptions:

1. Post framed buildings.
2. Buildings where, in the opinion of the building official, the gutters will become damaged by sliding snow.
3. Roofs with eaves or overhangs of six feet or greater.
4. Roofs that are constructed with internal roof drains.
5. Buildings where an approved alternate means of drainage is designed by a soils engineer or other qualified registered design professional.

IBC SECTION 1805
DAMPPROOFING AND WATERPROOFING

Delete the existing amendment. IBC Sections 1803 and 1805 contain ample provisions for geotechnical reports, the determination of groundwater levels and the provision of drain systems.

1806.1 Requirements for Slabs. Requirements for slabs below grade and crawl spaces.

1806.1.4.1 Slabs Below Grade. Building permits for structures with slabs below grade shall not be issued unless the finished slab elevation is 6 inches or more above the design water table.

1806.1.4.2 Peripheral Subdrain Required. Structures with slabs below grade shall be provided with a peripheral subdrain which slopes to a sump or sumps, daylight, or other approved point. In each case the ultimate discharge point(s) for peripheral subdrains shall be approved during building permit application review by the County.

1806.1.4.3 Crawl Spaces. Crawl spaces shall be permitted only where the design water table is a minimum of 36 inches below the interior finished crawl space grade.

Alternative Designs. Alternate designs and construction practices may be permitted where it is demonstrated to the reasonable satisfaction of the building official that they are in compliance with the intent of the criteria listed above.

IBC CHAPTER 30
ELEVATORS AND CONVEYING SYSTEMS

This chapter is deleted in its entirety.

Elevator and conveyance system repairs, installations, and inspections are governed by the Colorado Department Of Labor and Employment, Division of Oil and Public Safety, under the Elevator and Escalator Certification Act, ~~Title 9, Article 5.5, Sections 1-7, Colorado Revised Statutes~~ Colo. Rev. Stat. § 9-5.5-101 through 9-5.5-120 (2014).

Chapter 34 has been removed from the IBC. This necessitates the adoption of the International Existing Building Code ("IEBC").

~~IBC CHAPTER 34~~
~~Existing Structures~~

Delete this amendment and adopt an amended version of Appendix E of the IRC, "Manufactured Housing Used as Dwellings," to correlate with Colorado statutes and the installation standards of the Colorado Division of Housing.

~~IBC SECTION 3410~~
~~MOVED STRUCTURES~~

~~**3410.1 Conformance.** Structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.~~

~~**3410.2 Manufactured housing.**~~

~~**3410.2.1 General.** No manufactured home shall be installed or placed upon a site or manufactured home space unless a permit has first been obtained from the building official and the manufactured home bears a label or has other approved documentation certifying that the manufactured home was constructed in accordance with NFPA 501B/ANSI A119.1 (1973, 1974 and 1975 editions) or the federal Manufactured Home Construction and Safety Standards Act (42 U.S.C. 5401, et. seq., as amended). For manufactured homes placed in Wildfire Zone 1 see Section 722.4. For manufactured homes placed in Wildfire Zone 2 see Section 722.8.1.~~

~~**3410.2.1 Installation Standards.** Manufactured homes shall be installed in accordance with Resolution 20 of the State Housing Board, The Colorado Installation and Set-up Standards for Manufactured Housing,' which resolution adopts by reference, with amendments, NCSBCS A225.1 (ANSI A225.1-1987), the NCSBCS Standard for Manufactured Home Installations. Wind anchoring equipment (ties) shall be in accordance with the installation standards with wind zones information from the Boulder County Wind pressure Map.~~

~~**3410.2.3 Manufactured Homes on Permanent Foundations.** Manufactured homes which are not less than 24 feet in width and 36 feet in length and which have a brick, wood, or cosmetically equivalent exterior siding and a pitched roof and are otherwise in accordance with C.R.S. § 30-28-115(3)(a), as amended, may be installed outside of manufactured home parks if installed on engineered permanent foundations and if the installation is otherwise in accordance with all applicable site installation requirements of this code for dwellings. In addition, such homes shall be certified as having roof structures sufficient to support snow loads at the building site as shown on the Boulder County Snow Load Map. For manufactured home placement in Wildfire Zone 1 refer to Section 722.2.~~

~~**3410.2.4 Accessory Buildings and Structures.** Accessory structures including porches, stairways, landings, storage structures, awnings, carports, cabanas, ramadas, and similar structures shall be constructed in accordance with the Building Code and the applicable requirements of the Colorado Installation and Set-up Standards for Manufactured Housing. Accessory structures shall not increase the loading on manufactured homes unless proof is provided that the manufactured home has been designed to support such loads or the accessory structure is designed by an engineer.~~

~~**3410.2.5 Replacement Furnaces, Water Heaters and Wood Stoves.** The installation or replacement of furnaces, unit heaters, water heaters and solid-fuel-burning appliances shall be in accordance with the federal Manufactured Home Construction and Safety Standards Act as amended, and the applicable requirements of the Mechanical Code.~~

IBC APPENDIX CHAPTER J
GRADING

J103.2 Exemptions. A grading permit shall not be required for the following:

Retain the existing amendments, as follows:

8. Grading of 50 cubic yards or less.
9. Grading associated with approved agricultural grading.

   Exception: Irrigation ponds and stock ponds to be constructed at a depth of more than 24" must obtain a grading permit prior to construction.

Adopt IBC Appendix Chapter K, which provides administrative provisions for the NEC, which is otherwise an NFPA standard (NFPA 70) and does not contain administrative provisions which always work well with the International

Codes.

IBC APPENDIX CHAPTER K
ADMINISTRATIVE PROVISIONS

IBC SECTION K111
ELECTRICAL PROVISIONS

Delete Section K111.4, which could conflict with NEC requirements for not permitting non-metallic sheathed cable ("Romex") in buildings of certain types of construction and/or heights, and replace it with a new Section K111.4 requiring the installation of electric vehicle charging stations for all new commercial, industrial and multiple-family residential buildings and some additions to existing such buildings.

K111.4 ~~**Nonmetallic-sheathed cable.** The use of Type NM, NMC and NMS (nonmetallic sheathed) cable wiring methods shall not be limited based on height, number of stories or construction type of the building or structure.~~ **Electric vehicle (EV) charging** ~~**stations**~~ **receptacle outlets.** Level 2 (240-volt) electric vehicle (EV) charging ~~stations~~ receptacle outlets are to be installed for all new commercial, industrial or multiple-family residential buildings or additions or alterations to existing such buildings that increase the existing total floor area of the building by either fifty percent or by 5,000 square feet in accordance with Table K111.4. Charging ~~stations~~ receptacle outlets shall be installed in accordance with the requirements of Article 625 of the Electrical Code.

TABLE K111.4
ELECTRIC VEHICLE (EV) CHARGING RECEPTACLE OUTLETS

TOTAL PARKING SPACES PROVIDED	1-19	20-50	21-100	101-150	151-200	201-250	251-300	301-350	351-400	401-450	451-500	501 and over
REQUIRED MINUMUM NUMBER OF EV CHARGING OUTLETS	0	1	2	3	4	5	6	7	8	9	10	2% of total

Amendments to the Boulder County Building Code

Amendments to the 2015 International Residential Code ("IRC")

Adopt Appendix E, with amendments, to address manufactured housing. Appendix G has been removed and is replaced by the adoption of the International Swimming Pool and Spa Code. Adopt Appendices R and S, new appendix chapters for light straw-clay construction and strawbale construction, respectively.

~~**2012**~~ **2015 International Residential Code**, including specifically Appendix Chapters E, F, ~~G, and~~ H, R and S ~~thereof~~, published by the International Code Council ("ICC"), with amendments to the following:

PART 1—SCOPE AND APPLICATION

IRC SECTION R101
GENERAL

R101.1 Title. These provisions shall be known as the *Boulder County Residential Code for One- and Two-family Dwellings* ~~of [NAME OF JURISDICTION],~~ and shall be cited as such and will be referred to herein as "this code."

R102.2 Other laws. The provisions of this code shall not be deemed to nullify any provisions of local, state or federal law.

Add a new sub-section R102.2.1, as follows:

> **R102.2.1 Flood hazard areas.** Where conflicts occur between any provisions of this code and Section 4-400 of the Boulder County Land Use Code, "Floodplain Overlay District," the provisions of Section 4-400 of the Boulder County Land Use Code shall apply.

PART 2—ADMINISTRATION AND ENFORCEMENT

IRC SECTION R103
~~DEPARTMENT~~ DIVISION OF BUILDING SAFETY & INSPECTION SERVICES

R103.1 Creation of enforcement agency. The ~~department of~~ building safety and inspections services division is hereby created and the official in charge thereof shall be known as the *building official*.

IRC SECTION R104
DUTIES AND POWERS OF BUILDING OFFICIAL

Note: Delete the published Section R104.6 and retain the existing amended right of entry provisions, which give clear direction and are in accordance with Colorado law.

R104.6 Right of Entry. When the building official or his authorized representative has reasonable cause to believe that a violation of this code is likely to exist in a structure or upon a premises and that entry into the structure or upon the premises is necessary to verify the violation, the building official or his authorized representative shall first make a reasonable effort to locate the owner or other person having charge or control of the structure or premises, or portion thereof desired to be inspected, and request consent

to enter and inspect. If such person cannot be located or if entry is refused, the building official or his authorized representative may seek entry by submitting a sworn affidavit to the proper court of jurisdiction, setting forth facts sufficient to support a reasonable belief that the violation is likely to exist, and that further investigation of the structure or premises is warranted. Any subsequent entry and inspection shall be conducted in accordance with an administrative search warrant if issued by the court. The foregoing provisions of this subsection notwithstanding, consent to enter or an administrative search warrant shall not be required in the following circumstances:

1. To conduct inspections during regular county business hours under an applied for or issued building permit, for work authorized under that permit prior to the issuance of a final Certificate of Occupancy.
2. To make observations of the structure or premises in plain view from public property or from portions of the structure or premises which are open or accessible to the public, or in which the owner or occupant otherwise lacks a reasonable expectation of privacy.
3. In emergency situations in which the building official or his authorized representative has reason to believe that the public health or safety is in imminent danger and could be jeopardized by any delay in Securing entry.

Note: Delete the published Sections 104.8, "Liability," and 104.8.1, "Legal defense," and replace them with the existing amended liability provisions, which include a reference to the Colorado Governmental Immunity Act (C.R.S. §24-10-101, et seq., as amended), as follows:

104.8 Liability. This code shall not be construed to relieve or lessen the responsibility of any person owning, operating or controlling any building or structure in the unincorporated area of Boulder County for any damages or injuries to persons or property caused in whole or in part by defects or other conditions which may be subject to inspection or regulation under this code. Neither Boulder County, the Boulder County Board of County Commissioners, the Boulder County Land Use Department or any division thereof, the building official, or any other employee or authorized representative of Boulder County who is charged or connected with the enforcement of this code, shall be liable in damages for any act or omission in the course or context of the discharge of duties under this code or any provisions related to it, and nothing in this code or in its administration or enforcement shall be considered in any way to be a waiver by Boulder County or any of its officials or employees of the protection to which they are entitled under the Colorado Governmental Immunity Act, C.R.S. §24-10-101, et seq., as amended. Any claim or suit brought against the building official or any other employee or authorized representative of Boulder County which is alleged to have arisen out of or as a result of any act or omission in the enforcement of any provision of this code, and which occurred within the scope of employment of such official, employee or representative, shall be defended by Boulder County until final termination of such proceedings, and any judgment resulting there from shall be assumed by Boulder County.

R104.10 Modifications.

Add a new subsection on the use of the Performance Code as a tool and a guide. The Performance Code is currently adopted as such, but this provides additional clarity.

> **R104.10.2 Performance code.** The provisions of the *ICC Performance Code for Buildings and Facilities* may be used by the *building official* as a guide and a tool to evaluate proposals for modifications.

104.11 Alternative materials, design and methods of construction and equipment.

Add a new subsection on the use of the Performance Code as a tool and a guide. The Performance Code is currently adopted as such, but this provides additional clarity.

> **R104.11.2 Performance code.** The provisions of the *ICC Performance Code for Buildings and Facilities* may be used by the *building official* as a guide and a tool to evaluate proposals for alternative materials, design and methods of construction and equipment.

SECTION R105
PERMITS

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

Note: The following exemptions from building permits are as they exist in our current 2012 amendments, unless they are stricken by a ~~strike through~~ (deletion) or underlined (addition). The default for these exemptions is to use the wording in the 2015 IRC and otherwise match the exemptions from building permits in the Boulder County Land Use Code.

Building:

1. One-story detached accessory structures used as a storage shed, playhouse for private use, greenhouse, chicken coop, agricultural loafing shed, or similar uses, provided:

    a. The floor area of any structure does not exceed 120 square feet (11 m2), except agricultural loafing sheds, which may not exceed 200 square feet.
    b. The structure height does not exceed 12 feet,
    c. The structure does not have any utilities, and
    d. The structure does not violate the conditions of any existing land use approval or conservation easement.
    e. The number of allowed detached accessory structures which may be constructed without a building permit shall be determined by the size of the subject parcel:
        i. One detached accessory structure may be constructed without a building permit on parcels 0.5 acres or less in size.
        ii. Two detached accessory structures may be constructed without a building permit on parcels greater than 0.5 acre and less than ten acres.
        iii. Three detached accessory structures may be constructed without a building permit on parcels 10 acres and larger.

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

3. Retaining walls that are not over 4 feet (1219 mm) in height measured from the bottom of the footing to the top of the wall, unless supporting a surcharge or impounding Class I, II or IIIA liquids.

4. Water tanks supported directly on grade if the capacity is not greater than 5,000 gallons (18 925 L) and the ratio of height to diameter or width is not greater than 2:1.

5. Sidewalks and driveways not more than 30 inches (762 mm) above adjacent grade, and not over any basement or *story* below and not subject to a grading permit.

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

7. Prefabricated *swimming pools* that are less than 24 inches (610 mm) deep.

8. Swings and other playground equipment for private use accessory to detached one- and two-family *dwellings* and to *townhouses*.

9. Window awnings supported by an exterior wall that do not project more than 54 inches (1372 mm) from the *exterior wall* and do not require additional support.

10. Decks not exceeding 200 square feet (18.58 m^2) 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. Antennas and/or their supporting structures other than buildings, accessory to residential use less than ten feet in height and lower than the structure height limit in the zoning district in which located, or which were constructed or erected prior to July 1, 1988.

12. Temporary emergency noncommercial telecommunication-sites operated by a governmental agency, or by a volunteer public safety agency officially sanctioned by a governmental agency for that purpose, for public safety communication uses, for a period not to exceed six months.

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.

SECTION R106
CONSTRUCTION DOCUMENTS

Note: Retain existing amendment regarding water and sanitation requirements with some minor editorial changes.

R106.1.5 Water and Sanitation Requirements. Every building or addition thereto shall be provided with water and sanitation facilities in accordance with the provisions of this code. Water supplies and sewerage facilities shall be in conformance with regulations and requirements of the Boulder County Public Health Department, Colorado Department of Public Health and Environment and the Colorado Division of Water Resources ~~Office~~ or any supplier recognized thereby. When applica-

ble, evidence of same shall be submitted to the building official prior to the issuance of the building permit.

R106.2.1 Site Plans in Hillside Areas. When a building site is located in a hillside area and, in the opinion of the building official, is located in an area subject to geologic hazards the building official may require that a detailed site plan be submitted as a prerequisite to the issuance of a building permit. Such site plans, when required, shall be prepared by an architect or a civil engineer and shall be based on an accurate topographic map prepared by a land surveyor. The site plans shall bear the seal and signature of the responsible architect or civil engineer and the land surveyor. The topographic map shall encompass the building site and shall be drafted at a scale no smaller than 1 inch equal to 20 feet (1:240) and at a contour interval less than or equal to two (2) feet. Such site plans, at a minimum, shall show:

1. A grading plan showing existing and proposed contour lines reflecting the proposed grading as well as the locations and pertinent elevations of finished floors of all structures, basements, driveways, level areas, septic disposal fields and retaining walls.
2. The locations of all water wells (whether on-site or off) within 250 feet of any septic disposal field.
3. All property lines within 100 feet of the building site.
4. Setbacks of cut slopes, fill slopes, retaining walls, and structures from property lines.
5. At least one critical cross section oriented through the structural site and drafted at equal horizontal and vertical levels.

R106.2.2 Reports. When, in the opinion of the building official, certain geologic hazards or constraints including but not limited to, landslides, rock falls, flash flooding, mudslides, avalanches, subsidence and/or soil creep exist or may exist with respect to a specific building proposal, a soil and/or geologic investigation may be required prior to the issuance of a building permit. Such investigation, when required, shall be documented by submittal to the building official of an acceptable written report which is signed by a soils engineer and/or an engineering geologist within his field of expertise. Said report(s) shall contain specific recommendations regarding the building location and design. The relationships of (1) site grading, structural integrity, and septic drain fields and (2) the geologic hazards or constraints shall be considered in the report(s).

SECTION R108
FEES

R108.2 Schedule of permit fees. On buildings, structures, electrical, gas, mechanical and plumbing systems or *alterations* requiring a *permit*, a fee for each *permit* shall be paid as required, in accordance with the schedule as established by the ~~applicable governing authority~~ Boulder County Board of County Commissioners in a separate adopting resolution. For building permit, plan review, grading permit and other fees, please refer to the Boulder County Land Use Department publication, "Boulder County Building Permit Fees."

SECTION R115
CONTRACTOR LICENSING

R115.1 General. The contractor licensing provisions of Boulder County are adopted by the Board of County Commissioners under a separate adopting resolution. Please refer to the Boulder County Land Use Department publication, "Boulder County Contractor License" for details.

Part II—Definitions

CHAPTER 2
DEFINITIONS

SECTION R202
DEFINITIONS

AREA, FLOOR. The area of the building, existing or new, under consideration including *basements* and attached garages calculated without deduction for corridors, stairways, closets, the thickness of interior walls, columns, or other features as measured from the exterior face of the exterior walls.

BASEMENT. That portion of a building that is partially or completely below grade (see *story above grade plane*). An under floor space below the first *story* of the building that does not meet the definition of *story above grade plane* and has a *ceiling height*

measured from the *basement* floor to the bottom of the floor joists above of 6 feet 8 inches or more.

CRAWL SPACE. An under floor space below the first story floor of the building that does not meet the definition of *story above grade plane*, that has a *ceiling height* measured from the crawlspace grade or floor to the bottom of the floor joists above of less than six feet 8 inches, and that does not contain interior stairs, windows, wall, and ceiling finish materials, trim or finished flooring.

Part III—Building Planning and Construction

IRC CHAPTER 3
BUILDING PLANNING

IRC SECTION R301
DESIGN CRITERIA

Amend Section R301.2.1 to include the Boulder County Wind Pressure Map and note that nominal design wind speeds from the map must be converted to ultimate design wind speeds for use in the code. The report, "Colorado Front Range Gust Map – ASCE 7-10 Compatible," dated November 18, 2013, by Jon A. Peterka, may be used to provide a wind speed conversion equation and table.

R301.2.1 Wind design criteria. Buildings and portions thereof shall be constructed in accordance with the wind provisions of this code using the ~~ultimate design wind speed in Table R301.2(1) as determined from Figure R301.2(4)A~~ nominal design wind speeds, V_{sd}, from the Boulder County Wind Pressure Map (titled the Wind Speed Map for the Front Range of Colorado) prepared by Jon A Peterka and dated February 28, 2006, titled "Colorado Front Range Gust Map and Snow Load Design Data for Colorado" and converting them to ultimate design wind speeds, V_{ult}. The structural provisions of this code for wind loads are not permitted where wind design is required as specified in Section R301.2.1.1. Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where not otherwise specified, the wind loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.4. A continuous load path shall be provided to transmit the applicable uplift forces in Section R802.11.1 from the roof assembly to the foundation.

Add a sentence at the beginning of Section R 301.2.3 to cite the Boulder County Snow Load Map, with the remainder of the section to remain as published.

R301.2.3 Snow Loads. Ground snow loads shall be determined based on the Boulder County Snow Load Map prepared by the Structural Engineers Association of Colorado and dated October 1971, titled "Colorado Front Range Gust Map and Snow Load Design Data for Colorado, as amended." Wood-framed construction, coldformed, steel-framed construction and masonry and concrete construction, and structural insulated panel construction in regions with ground snow loads 70 pounds per square foot (3.35 kPa) or less, shall be in accordance with Chapters 5, 6 and 8. Buildings in regions with ground snow loads greater than 70 pounds per square foot (3.35 kPa) shall be designed in accordance with accepted engineering practice.

Revise summer design temperature to reflect Denver value in 2015 IPC Appendix D. Add footnote 4 to reference county floodplain regulations. ~~Delete~~ Retain "Anticipated Snow Depth," as ~~this is not included in the published IRC~~ it is used to determine the exterior mounting height for direct vents for gas-fired appliances.

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

GROUND SNOW LOAD	Varies[1]
WIND SPEED	Varies[2]
TOPOGRAPHIC EFFECTS	No
SPECIAL WIND REGION	Yes
SEISMIC DESIGN CATEGORY	B
WEATHERING	Severe

FROST LINE DEPTH	30”
TERMITE	Slight to Moderate
WINTER DESIGN TEMPERATURE	1° F.
SUMMER DESIGN TEMPERATURE	~~90° F.~~ 91° F.
ICE BARRIER UNDERLAYMENT REQUIRED	Yes[3]
FLOOD HAZARDS	Yes[4]
AIR FREEZING INDEX	1000
ANNUAL MEAN TEMPERATURE	50° F.
ANTICIPATED SNOW DEPTH:[5]	
Plains	12 inches
Mountains	24 inches

[1] See Boulder County map, “Colorado Front Range Gust Map and Snow Load Design Data for Colorado” ~~dated 2007~~, as amended.

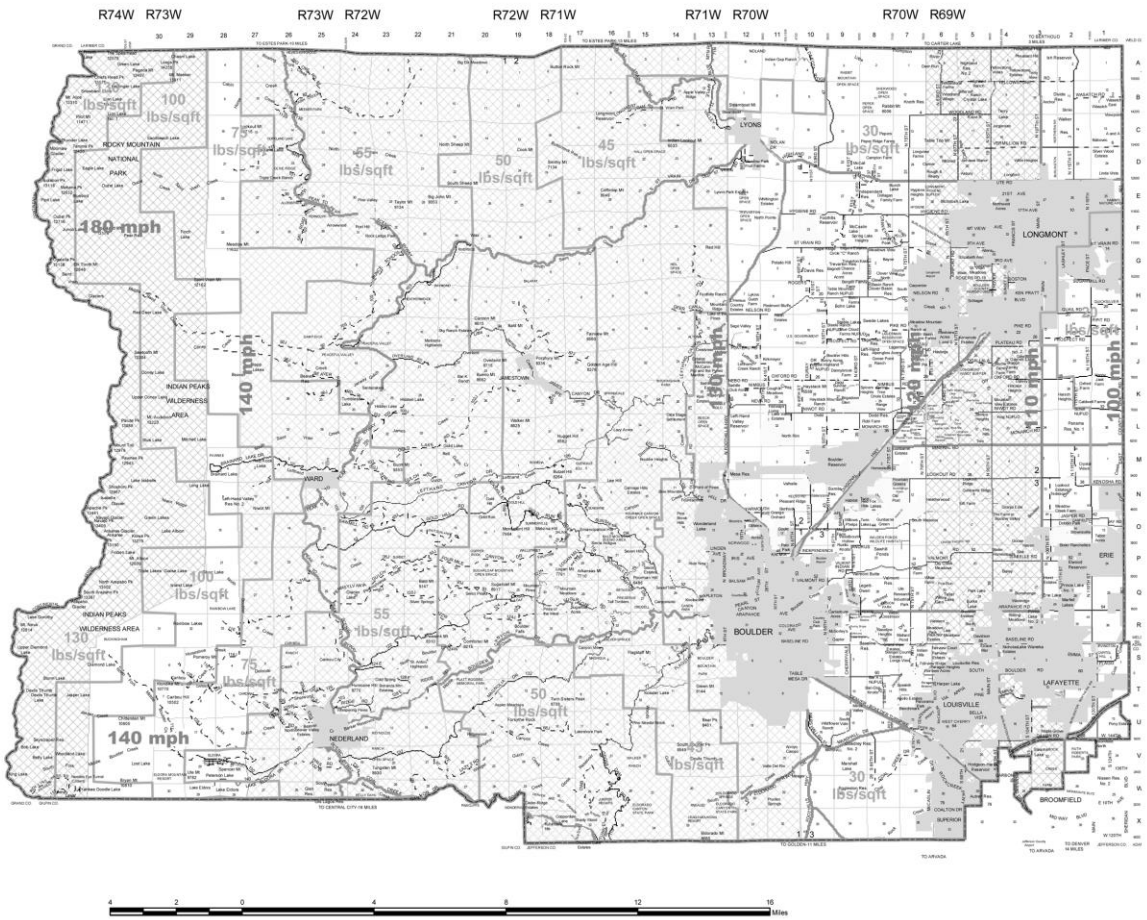
[2] See Boulder County map, “Colorado Front Range Gust Map and Snow Load Design Data for Colorado” ~~dated 2007~~, as amended.

[3] In situations where there is evidence of previous damage due to the effects of ice damming or where there is clearly potential for damage due to ice damming, the provisions of Sections R905.1.2 shall apply.

[4] Refer to Section 4-400 of the Boulder County Land Use Code, “Floodplain Overlay District,” for Boulder County’s floodplain regulations and official floodplain overlay district maps.

[5] This is used to determine the required minimum exterior mounting height for direct vents for gas-fired appliances.

Footnotes “a” through “m” remain as published.



Colorado Front Range Gust Map and Snow Load Design Data for Colorado

LEGEND

140 mph

Design 3 Second Gust Wind Load
Interpolate between vertically labelled lines.
Constant with horizontally labelled areas.

50 lbs/sqft

Design Ground Snow Load

Incorporated Areas

Subdivision or Platted Area

Note:

Snow load design data based on report on "Snow load design data for Colorado", prepared by the Structural Engineers Assoc. of Colorado, Oct. 1971. Modified by by the Boulder County building official as permitted in the International Building Code 2006 and International Residential Code 2006. This design data map provides the basic design ground snow loads for anywhere within Boulder County.

Wind Load design data based on a report titled "Colorado Front Range Gust Map" presented to the Structural Engineers Association of Colorado (SEAC) at its March 16, 2006 General Meeting, authored by Jon A. Peterka with the technical assistance of SEAC's Wind Load Committee

North

Boulder County

This map is for illustrative purposes only, and is not suitable for parcel-specific decision making. The areas depicted here are approximate. More site-specific studies may be required to draw accurate conclusions.

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IRC SECTION R303
LIGHT, VENTILATION, AND HEATING

~~**R303.1.1 Habitable Rooms.** Mechanical ventilation shall be provided in all habitable rooms by an approved mechanical ventilation system capable of providing the rate of air change required in Table N1103.5.1.~~

The amendment above may be deleted, as the published IRC provision below eliminates the need for it.

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

Retain existing amendment allowing wood-burning as a primary heat source.

R303.8 Required heating. When the winter design temperature in Table R301.2(1) is below 60°F (16°C), every dwelling unit shall be provided with heating facilities capable of maintaining a minimum room temperature of 68°F (20°C) at a point 3 feet above the floor and 2 feet from exterior walls in all habitable rooms at the design temperature. The installation of one or more portable space heaters shall not be used to achieve compliance with this Section.

> **Exception:** Appliances relying on biofuels that are capable of maintaining the required temperature may be used to meet the requirements of this section. Permanently installed automatic space heating or other approved methods must be used to prevent pipes from freezing when outdoor temperatures are below freezing and the dwelling is vacant.

Add additional exceptions from fire sprinklering additions to correspond with the Boulder County Land Use Code definition of "Residential Floor Area," which exempts carports up to 400 square feet in floor area from being included in residential floor area. Carports are required by IRC Section R309.2 to be open on not less than two sides. This 1) provides for the dissipation of heat and smoke, 2) makes it less likely that high quantities of combustible materials will be stored in them, and 3) provides for fire department access, both from the standpoint of the two open sides and due to the fact that they are connected to a driveway.

IRC SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

R313.1 Townhouse Automatic Fire Sprinkler Systems. An automatic residential fire sprinkler system shall be installed in townhouses.

> **R313.1.1 Additions to existing townhouses**. An automatic residential fire sprinkler system shall be installed throughout existing townhouses with additions when the sum of the total floor area of the addition plus the existing townhouse is increased to 4,800 sq. ft. or greater.
>
> **Exceptions:**
>
> 1. One-time additions not exceeding 200 square feet in floor area, and
> 2. Carport additions which are exempt from the definition of "Residential Floor Area" in Section 18-189D of the Boulder County Land Use Code.
>
> **R313.1.2 Design and installation.** Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section P2904. Systems shall be installed with a fire department connection (FDC) and other associated devices when required by the fire code official.

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 federally-certified manufactured dwellings or Colorado Department of Local Affairs, Division of Housing, state-certified factory-built dwellings that are certified to editions of the IRC prior to the 2012 edition.
>
> **R313.2.1 Additions to existing one- and two-family dwellings.** An automatic residential fire sprinkler system shall be installed throughout existing one- and two-family dwellings with additions when the sum of the total floor area of the addition plus the existing one- and two-family dwelling is increased to 4,800 sq. ft. or greater. The floor area of detached

structures having floor areas of 120 square feet or greater that are located less than 50 feet from the dwelling shall be included in the floor area calculated for the dwelling.

Exceptions:

1. One-time additions not exceeding 200 square feet in floor area, and
2. Carport additions which are exempt from the definition of "Residential Floor Area" in Section 18-189D of the Boulder County Land Use Code.

R313.2.2 Remodels/renovations to existing one- and two-family dwellings. An automatic residential fire sprinkler system shall be installed throughout existing one- and two-family dwellings with a floor area of 4,800 sq. ft. or greater where renovations or remodeling work for which a building permit is required takes place in more than 50% of the area within the structure.

R313.2.3 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D. Systems shall be installed with a fire department connection (FDC) and other associated devices when required by the fire code official.

IRC SECTION R321
ELEVATORS AND PLATFORM LIFTS

Add an existing 2012 amendment from another location to clarify permitting and inspection requirements as Section R321.4. The remainder of the section is to remain as published.

R321.4 **Permits and inspections.** Each residential conveyance must be applied for on a separate building permit. Inspections shall be performed by an inspector who has obtained ASME QEI-1 certification. The inspection report(s) must be sent to the Building Safety & Inspection Services Division for review and approval at the completion of the work and prior to the use of the conveyance.

~~SECTION R324~~
~~MOVED BUILDINGS~~

Delete this group of amendments for manufactured housing and replace it with the adoption of IRC Appendix E, "Manufactured Housing Used as Dwellings." Some amendments are necessary to correlate with the Land Use Code, applicable Colorado statutes and the installation standards adopted by the Colorado Division of Housing.

~~**R324.1 Conformance.** Structures moved into or within the jurisdiction shall comply with the provisions of this code for new buildings or structures.~~

~~**R324.2 Manufactured housing.**~~

~~**R324.2.1 General.** No manufactured home shall be installed or placed upon a site or manufactured home space unless a permit has first been obtained from the building official and the manufactured home bears a label or has other approved documentation certifying that the manufactured home was constructed in accordance with NFPA 501B/ANSI A119.1 (1973, 1974 and 1975 editions) or the federal Manufactured Home Construction and Safety Standards Act (42 U.S.C. 5401, et. seq., as amended). For manufactured homes placed in Wildfire Zone 1, see Section R325.4. For manufactured homes placed in wildfire zone 2, see Section R R325.8.1.~~**~~R324.2.2 Installation standards.~~** ~~Manufactured homes shall be installed in accordance with Resolution 20 of the State Housing Board, "The Colorado Installation and Set-up Standards for Manufactured Housing, which resolution adopts by reference, with amendments, NCSBCS A225.1 (ANSI A225.1-1987), the NCSBCS Standard for Manufactured Home Installations. Wind anchoring equipment (ties) shall be in accordance with the installation standards with wind zones information from the Boulder County Wind Pressure Map.~~
~~For manufactured homes placed in Wildfire Zone 1, see Section R325.~~

~~**R324.2.3 Manufactured homes on permanent foundations.** Manufactured homes which are not less than 24 feet in width and 36 feet in length and which have a brick, wood, or cosmetically equivalent exterior siding and a pitched roof and are otherwise in accordance with C.R.S. 30-28-115(3)(a), as amended may be installed outside of manufactured home parks if installed on engineered permanent foundations and if the installation is otherwise in accordance with all applicable site installation requirements of this code for dwellings. In addition, such homes shall be certified as having roof structures sufficient to support snow loads at the building site as shown on the Boulder County Snow Load Map.~~

~~**R324.4 Accessory buildings and structures.** Accessory structures including porches, stairways, landings, storage structures, awnings, carports, cabanas, ramadas, and similar structures shall be constructed in accordance with the Building Code and the applicable requirements of the Colorado Installation and Set-up Standards for Manufactured Housing. Accessory struc-~~

~~tures shall not increase the loading on manufactured homes unless proof is provided that the manufactured home has been designed to support such loads.~~

~~**R324.5 Replacement furnaces, water heaters and wood stoves.** The installation or replacement of furnaces, unit heaters, water heaters and solid-fuel-burning appliances shall be in accordance with the federal Manufactured Home Construction and Safety Standards Act, as amended, and the applicable requirements of the Mechanical Code.~~

SECTION R324
SOLAR ENERGY SYSTEMS

Amend the published roof-mounted solar PV panel spacing requirements to match the more flexible requirements adopted by the City of Boulder Fire Department in their adoption of the 2012 International Fire Code ("IFC").

R324.7 Access and pathways. Roof access, pathways and spacing requirements shall be provided in accordance with Sections R324.7.1 through R324.7.2.5. <u>All access pathways required under this section shall be provided in a structurally sound location capable of supporting the live load of firefighters accessing the roof.</u>

Exceptions:

1. Detached garages and accessory structures to one and two-family *dwellings* and *townhouses*, such as parking shade structures, carports, solar trellises and similar structures.

2. Roof access, pathways and spacing requirements need not be provided where an alternative ventilation method *approved* by the code official has been provided or where the code official has determined that vertical ventilation techniques will not be employed.

R324.7.1 Roof access points. Roof access points shall be located in areas that do not require the placement of ground ladders over openings such as windows or doors, and located at strong points of building construction in locations where the access point does not conflict with overhead obstructions such as tree limbs, wires or signs.

R324.7.2 Solar photovoltaic systems. Solar photovoltaic systems shall comply with Sections R324.7.2.1 through R324.7.2.5.

R324.7.2.1 Size of solar photovoltaic array. Each photovoltaic array shall be limited to 150 feet by 150 feet (45 720 by 45 720 mm). Multiple arrays shall be separated by a clear access pathway not less than 3 feet (914 mm) in width.

R324.7.2.2 Hip roof layouts. Panels and modules installed on *dwellings* with hip roof layouts shall be located in a manner that provides a clear access pathway not less than 3 feet (914 mm) in width from the eave to the ridge on each roof slope where panels and modules are located. The access pathway shall be located at a structurally strong location on the building capable of supporting the live load of fire fighters accessing the roof.

Exceptions:

1. ~~These requirements shall not apply to r~~ <u>R</u>oofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.
2. <u>Roofs where each panel/module array area on the roof is 1,000 square feet (92.90 m^2) or less in size, no continuous section of panels/modules is larger than 150 feet in length or width, a clear access pathway of not less than 12-inch-width is provided along each side of all horizontal ridges, and a clear access pathway of not less than 30-inch-width is provided from the eave to the ridge of one roof slope where panels/modules are located.</u>
3. <u>Roofs where each panel/module array area on the roof is 1,000 square feet (92.90 m^2) or less in size, no continuous section of panels/modules is larger than 150 feet in length or width, a clear access pathway of not less than 12-inch-width is provided along each side of all horizontal ridges, and, where panels/modules are to be placed on both sides of a hip, a clear access pathway of not less than 18-inch-width is provided along each side of such hip.</u>
4. <u>Roofs where the total combined area of solar array does not exceed 33 percent as measured in plan view of the total roof area of the structure.</u>

R324.7.2.3 Single ridge roofs. Panels and modules installed on *dwellings* with a single ridge shall be located in a manner that provides two, 3-foot-wide (914 mm) access pathways from the eave to the ridge on each roof slope where panels or modules are located.

Exceptions:

1. ~~This requirement shall not apply to r~~ Roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

2. Roofs where each panel/module array area on the roof is 1,000 square feet (92.90 m^2) or less in size, no continuous section of panels/modules is larger than 150 feet in length or width, and a clear access pathway of not less than 12-inch-width is provided along each side of the horizontal ridge, provided that:

   a. The total combined area of solar array does not exceed 33 percent as measured in plan view of the total roof area of the structure; or

   b. A 30-inch-wide clear access path is provided from the eave to the ridge of a roof slope where panels/modules are located.

R324.7.2.4 Roofs with hips and valleys. Panels and modules installed on *dwellings* with roof hips or valleys shall not be located less than 18 inches (457 mm) from a hip or valley where panels or modules are to be placed on both sides of a hip or valley. Where panels are to be located on one side only of a hip or valley that is of equal length, the 18-inch (457 mm) clearance does not apply.

Exceptions:

1. ~~These requirements shall not apply to r~~ Roofs with slopes of 2 units vertical in 12 units horizontal (16.6 percent) and less.

2. Roofs where a 30-inch-wide clear access pathway is provided from the eave to the ridge as well as 12-inch-wide clear access pathways along each side of any horizontal ridge.

R324.7.2.5 Allowance for smoke ventilation operations. Panels and modules installed on dwellings shall not be located less than 3 feet (914 mm) below the roof ridge to allow for fire department smoke ventilation operations.

Exception: Where an alternative ventilation method approved by the code official has been provided or where the code official has determined that vertical ventilation techniques will not be employed, clearance from the roof ridge is not required.

Note: Two additional sections, R325 and R326, have been added to the 2015 IRC, so the subsequent amendments sections are renumbered accordingly. The main proposed changes for what is now Section R327, ignition-resistant construction, are to eliminate the existing three (3) hazard ratings, Moderate, High and Extreme, simplifying the amendments so that there is only one set of requirements that applies to all properties. In addition, the latest Colorado State Forest Service (CSFS) guide, which is greatly improved over the previous one, is now defined as our defensible space standard, and either the implementation of an approved wildfire mitigation plan or the issuance of a Wildfire Partners Certificate is deemed to meet our defensible space requirements.

SECTION ~~R325~~ R327
IGNITION-RESISTANT MATERIALS AND CONSTRUCTION

~~R325.1~~ R327.1 Requirements based on locations in wildfire zones.

Add wording to clarify that a wildfire mitigation plan may be required through site plan review or other review processes required under the Boulder County Land Use Code.

~~R325.1.1~~ R327.1.1 General. Unless other more restrictive requirements, such as those requiring an approved wildfire mitigation plan imposed through Site Plan Review or other review processes required by the Boulder County Land Use Code, apply, this section shall be applicable to all new buildings, additions and repairs, including buildings designed and constructed in accordance with the *International Building Code*.

Revise the exceptions to the ignition-resistant construction requirements. The source for these exceptions is unclear and they are not found in the published International Wildland-Urban Interface Code. The revisions exempt 200-sq.-ft.additions similar to other exceptions and allow decks or deck additions or repairs without requiring the implementation of a full defensible space paln.

Exceptions:

1. ~~Detached accessory structures with a floor area not exceeding 400 sq. ft.~~ One-time additions not exceeding 200 square feet in floor area.

2. ~~Additions to structures that do not increase the existing floor area by more than 20%.~~ Construction involving only new decks or additions or repairs to existing decks need not comply with all of the defensible space requirements of Section R327.4.13, provided that *defensible space* is provided around the deck for Zone 1 in accordance with the *defensible space standard* and a weed barrier and gravel is provided on all sides of the deck in accordance with Section R327.4.13.1.

3. ~~Additions which increase the existing floor area by more than 20% but not more than 30% need not comply, provided defensible space is provided for the entire dwelling in conformance with Sections 325.5.10, 325.6.10 or 325.7.10, as applicable.~~

~~R325.2~~ R327.2 Wildfire Zones Defined. For the purpose of this code, the unincorporated portion of Boulder County is divided into wildfire zones, which shall be known and designated as Wildfire Zone 1 and Wildfire Zone 2. The wildfire zones shall include such territory or portions of the unincorporated county as shown in Figure ~~No. 1~~ R327.2, the Wildfire Zone Map~~, which is attached to and incorporated into this section by this reference.~~

~~R325.2.1~~ R327.2.1 Buildings Located in More Than One Wildfire Zone. A building or structure that is located partly in one wildfire zone and partly in another shall be considered to be in the wild-fire zone in which the more restrictive conditions apply.

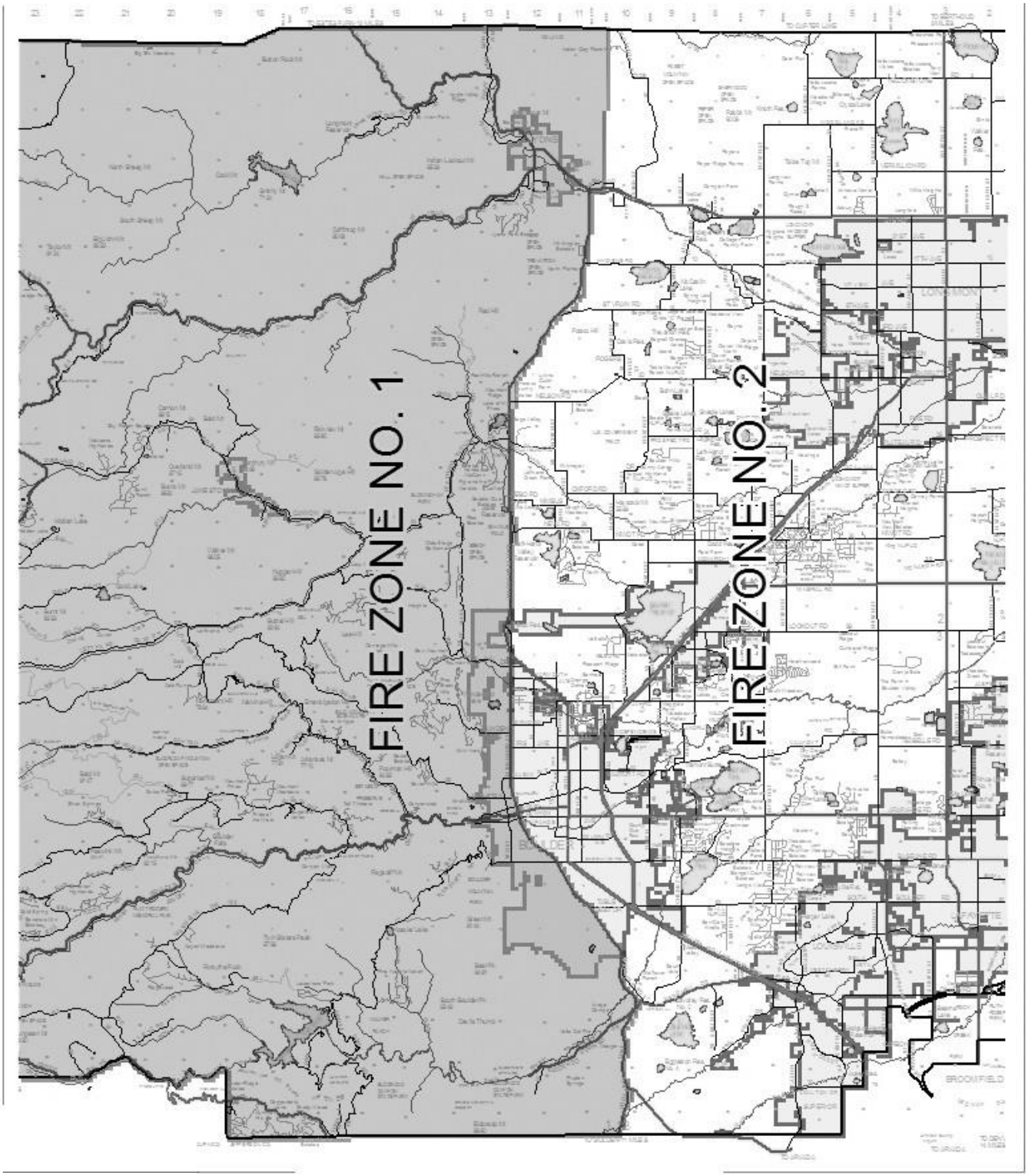
~~R325.2.2~~ R327.2.2 Moved Buildings. Any building or structure moved within or into any wildfire zone shall be made to comply with all the requirements for new buildings in that wildfire zone.

~~R325.3~~ R327.3 Definitions. The following words and terms shall, for the purpose of this Section, have the meanings shown herein.

Eliminating the three (3) current site hazard ratings in favor of one set of requirements allows for the deletion of a number of existing definitions.

~~**CRITICAL FIRE WEATHER.** A set of weather conditions (usually a combination of low relative humidity and wind) whose effects on fire behavior make control difficult and threaten fire fighter safety.~~

FIGURE R327.2
WILDFIRE ZONE MAP



Add a definition for "Defensible Space" from the 2015 International Wildland-Urban Interface Code.

DEFENSIBLE SPACE. An area either natural or manmade, where material capable of allowing a fire to spread unchecked has been treated, cleared or modified to slow the rate and intensity of an advancing wildfire and to create an area for fire suppression operations to occur.

Add a definition for "Defensible Space Standard," citing the latest CSFS guide, which is a great improvement over the venerable but outdated Publication No. 6.302.

DEFENSIBLE SPACE STANDARD. The Colorado State Forest Service publication, "Protecting Your Home from Wildfire: Creating Wildfire-Defensible Zones, 2012 Quick Guide" is an *approved* standard for meeting the *defensible space* requirements of Section R327.4.14 or for the creation of a *wildfire mitigation plan*, and can be found at the following link:

http://csfs.colostate.edu/csfspublications/ under Wildfire Mitigation & Education, Resources for Homeowners & Landowners.

~~**HEAVY FUEL.** Vegetation in closed canopy and mixed forest areas consisting of woody plants 6 inches to 8 inches or greater in diameter. Vegetation at the site includes: Dense conifer stands with heavy accumulation of litter and downed wood, abundant conifer regeneration, dense conifer stands that are suffering damage from insects, disease, or wind, closed stands of ponderosa or lodgepole pines, Douglas fir and/or Engleman spruce/Subalpine fir.~~

~~**MEDIUM FUEL.** Vegetation in closed canopy areas with some openings consisting primarily of woody plants 6 to 8 inches in diameter with some larger diameter trees. Vegetation at the site includes: Dense brush, brush where 1/4 of the area is covered with dead fuel, stands of ponderosa pine and Douglas fir, with woody understory and/or conifer regeneration occupying at least 1/3 of the site.~~

~~**LIGHT FUEL.** Vegetation in open canopy areas with some leaf and needle litter consisting of primarily herbaceous and woody plants less than 1/4 inch in diameter or 3 ft. in height. Vegetation at the site includes: grasses, forbs, some shrubs and overstory trees occupying less than 1/3 of the area.~~

~~**EXTREME HAZARD WILDFIRE SITES.** A building site with the potential critical fire weather condition in excess of 8 days with slopes of 40% and greater and medium fuel loading; or a building site with a critical fire weather condition in excess of 1 day with slopes greater than 40% and heavy fuel loading.~~

Insert new definitions for FIRE-RETARDANT-TREATED WOOD and HEAVY TIMBER CONSTRUCTION (Type IV, HT). As defined terms, they will appear in italics, and this eliminates the need to repeat detailed descriptions for them throughout the code.

FIRE-RETARDANT-TREATED WOOD. Wood meeting the requirements of Section R802.1.5 of the IRC or Section 2303.2 of the IBC.

HEAVY TIMBER CONSTRUCTION (Type IV, HT). Construction with wood framing members, columns, flooring and roof decks sized in accordance with IBC Section 602.4.

~~**HIGH HAZARD WILDFIRE SITES.** A building site with the potential critical fire weather condition of at least 8 days with slopes greater than 60% and light fuel loading; a building site with a critical fire weather condition greater than 1 day with slopes of at least 40% and medium fuel loading; a building site with a critical fire weather condition of at least 1 day with level ground or slopes not greater than 40% and heavy fuel loading.~~

Update this definition to correlate better with Section 503.2 of the 2015 edition of the International Wildland-Urban Interface Code and to refer to the latest approved materials from the California State Fire Marshal's Office.

IGNITION-RESISTANT BUILDING MATERIAL. Ignition-resistant building materials shall comply with any one of the following:

1. ~~**Extended ASTM E 84 testing.** Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723, for a test period of 30 minutes, comply with the following:~~ Material shall be tested on all sides with the extended ASTM E 84 (UL 723) test or ASTM E 2768, except panel products shall be permitted to test only the

front and back faces. Panel products shall be tested with a ripped or cut longitudinal gap of 1/8 inch (3.2 mm). Materials that, when tested in accordance with the test procedures set forth in ASTM E 84 or UL 723 for a test period of 30 minutes, or with ASTM E 2768, comply with the following:

1.1 Flame spread. Material shall exhibit a flame spread index not exceeding 25 and shall not show ~~no~~ evidence of progressive combustion following the extended 30 minute test.

1.2 Flame front. Material shall exhibit a flame front that does not progress more than 10½ feet (3200 mm) beyond the centerline of the burner at any time during the extended 30-minute test.

1.3 Weathering. *Ignition-resistant building material*s shall maintain their performance in accordance with this Section under conditions of use. Materials shall meet the performance requirements for weathering (including exposure to temperature, moisture and ultraviolet radiation) contained in the following standards, as applicable to the materials and the conditions of use:

1.3.1 Method A "Test Method for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing" in ASTM D 2898, for fire-retardant-treated wood, wood-plastic composite and plastic lumber materials.

1.3.2 ASTM D 7032 for wood-plastic composite materials.

1.3.3 ASTM D 6662 for plastic lumber materials.

1.4 Identification. All materials shall bear identification showing the fire test results.

Exception: Materials comprised of a combustible core and a noncombustible exterior covering, comprised of either aluminum at a minimum 0.019 inch (0.48 mm) thickness or corrosion-resistant steel at a minimum .0149 inch (0.38 mm) thickness shall not be required to be tested with a ripped or cut longitudinal gap.

2. Noncombustible material. Material that complies with the ~~definition~~ requirements for *noncombustible* materials in this ~~S~~section ~~R325.2.3~~.

3. Fire-retardant-treated wood. *Fire-retardant-treated wood* labeled for exterior use ~~and meeting the requirements of Section R802.1.3~~ R802.1.5 ~~of the International Residential Code~~.

4. Fire-retardant-treated wood roof coverings. Roof assemblies containing *fire-retardant-treated wood* shingles and shakes which comply with the requirements of Section R902 of ~~the International Residential Code~~ this code and classified as Class A roof assemblies as required in Section R902 of ~~the International Residential Code~~ this code.

5. Materials currently approved by the California Department of Forestry and Fire Protection, Office of the State Fire Marshal. ~~, in the publication, "Wildland Urban Interface (WUI) Products" and referred to as the "WUI Products Handbook," published by CAL FIRE, Fire Engineering Division, Building Materials Listing Program (http://osfm.fire.ca.gov/strucfireengineer/pdf/bml/wuiproducts.pdf)~~ Approved materials may be searched for via the following link:

http://osfm.fire.ca.gov/licensinglistings/licenselisting_bml_searchcotest.php

Search categories include **8110-Decking Materials**, **8120-Exterior Windows**, **8140-Exterior Sidings and Sheathings**, **8150-Exterior Doors** and **8160-Under Eave**.

Add a new definition for Log Wall Construction" from the 2015 International Wildland-Urban Interface Code (IWUIC).

LOG WALL CONSTRUCTION. A type of construction in which exterior walls are constructed of solid wood members and where the smallest horizontal dimension of each solid wood member is at least 6 inches (152 mm).

~~**MODERATE HAZARD WILDFIRE SITES.** A building site with the potential critical fire weather condition of at least 1 day with level or sloping ground with light fuel loading; a building site with a critical fire weather condition of at least 1 day with level or sloping ground with medium fuel loading.~~

NONCOMBUSTIBLE. As applied to building construction material means a material that, in the form in which it is used, is either one of the following:

1. Material of which no part will ignite and burn when subjected to fire. Any material conforming to ASTM E 136 shall be considered *noncombustible* within the meaning of this Section.

2. Material having a structural base of *noncombustible* material as defined in Item 1 above, with a surfacing material not over 1/8 inch (3.2 mm) thick, which has a flame spread index of 50 or less. Flame spread index as used herein refers to a flame spread index obtained according to tests conducted as specified in ASTM E 84 or UL723.

"*Noncombustible*" does not apply to surface finish materials. Material required to be *noncombustible* for reduced clearances to flues, heating appliances or other sources of high temperature shall refer to material conforming to Item 1. No material shall be classified as noncombustible that is subject to increase in combustibility or flame spread index, beyond the limits herein estab
lished, through the effects of age, moisture or other atmospheric condition.

Add a new definition for "Wildfire Mitigation Plan," based on the Boulder County Land Use Code.

WILDFIRE MITIGATION PLAN. A *wildfire mitigation plan* addresses the appropriate site location for structures, construction design and the use of ignition-resistant building material, defensible space and fuel reduction around structures, driveway access for emergency vehicles and an emergency water supply for firefighting in accordance with Article 4-804(C.)(12.) of the Boulder County Land Use Code.

Add a new definition for the Wildfire Partners program. Participation and certification in the program may be used to satisfy some of the requirements of this section.

WILDFIRE PARTNERS. Wildfire Partners is a collaborative Boulder County wildfire hazard mitigation program for homeowners that helps to reduce the risk of damage to homes from wildland fire. In Wildfire Partners, homeowners take personal responsibility for preparing their home and property for wildland fire and actively participate in an on-site assessment with a wildfire mitigation specialist. When participants complete their customized wildfire mitigation plan and pass their follow up inspection, they receive a Wildfire Partners Certificate and may be eligible for financial assistance. For further information, see the following link:

http://www.wildfirepartners.org/

~~**R325.4**~~ **R327.4 Restrictions in Wildfire Zone No. 1.** Buildings constructed in Wildfire Zone 1 shall comply with this section. ~~When additions to existing structures increase the floor area by 100% or more existing portions of the building must be made to comply~~.

~~**R325.4.1 Exterior material requirements throughout Wildfire Zone 1.**~~

~~**R325.4.2**~~ **R327.4.1 Roof Covering.** Roof covering materials installed in Wildfire Zone 1 shall be listed Class A roof covering materials or be constructed as a Class A roof assembly. For roof coverings where the profile allows a space between the roof covering and roof decking, the space at the eave ends shall be fire stopped to preclude entry of flames or embers, or have one layer of 72-pound (32.4 kg) mineral-surfaced, non-perforated cap sheet complying with ASTM D 3909 installed over the combustible decking.

~~**R325.4.2.1**~~ **R327.4.1.1 Roof valleys.** When provided, valley flashings shall be not less than 0.019 inch (No. 26 galvanized sheet gage) corrosion-resistant metal installed over a minimum 36-inch-wide underlayment consisting of one layer of 72-pound mineral-surfaced, non-perforated cap sheet complying with ASTM D 3909 running the full length of the valley.

Add language requiring an approved means to prevent the accumulation of debris in gutters and to reference the exceptions to requiring gutters elsewhere in the amendments.

~~**R325.4.3**~~ **R327.4.2 Gutters and Downspouts.** Gutters, ~~and~~ downspouts and gutter covering devices shall be constructed of noncombustible material. Gutters shall be provided with an approved means to prevent the accumulation of leaves, pine nee-

dles and debris in the gutter.

Exception: Buildings meeting one or more of the exceptions to Section R401.3.1 of this code may be constructed without gutters and downspouts.

~~**R325.4.4**~~ **R327.4.3 Spark Arrestors.** Chimneys serving fireplaces, barbecues, incinerators or decorative heating appliances in which solid or liquid fuel is used shall be protected with a spark arrester. Spark arresters shall be constructed of woven or welded wire screening of 12 USA standard gauge wire (0.1046 inch)(2.66 mm) having openings not exceeding ½ inch (12.7 mm). The net free area of the spark arrester shall not be less than four times the net free area of the outlet of the chimney.

Delete this section, as the same requirement is covered under the "Decks, Appendages and Projections" section below.

~~**R325.4.5**~~ ~~**R327.4.4 Deck Walking Surface.** Deck walking surface materials shall be approved *noncombustible materials*, *ignition-resistant materials* in accordance with Section R325.3, approved wood-thermoplastic composite lumber with an ASTM E84 flame-spread index no greater than 200, or any Class A roof assembly.~~

Add a requirement that fences or other attachments to buildings are to be noncombustible within 3 feet of the exterior walls. These items have served as a link to buildings that led to ignition from surface fires.

R327.4.4 Fences, retaining walls and similar appurtenances. Fences, retaining walls or other appurtenances that connect to buildings must be constructed of *noncombustible materials* or *ignition-resistant materials* for a distance of 3 feet beyond the exterior walls.

~~**R325.4.6 Wildfire Hazard Zone Classification.** Upon application for a building permit, each building site within Wildfire Zone 1 shall have its site-specific wildfire hazard classified by the Building Official. Wildfire hazard sites shall be classified as extreme wildfire hazard sites, high wildfire hazard sites, or moderate wildfire hazard sites pursuant to the definitions in Section R325.2.3 Exterior materials shall be approved based on the wildfire hazard site classification. Buildings hereafter erected, constructed, enlarged, altered, repaired or moved into Wildfire Zone No. 1 shall comply with the specific construction requirements for their wildfire hazard classification.~~

Delete the Extreme Hazard Wildfire Site section, as site hazard ratings are eliminated and there is only one set of ignition-resistant requirements that are based upon the previous "High" rating section.

~~**R325.5 Restrictions for Extreme Hazard Wildfire Sites.**~~

~~**R325.5.1 General.** Construction in extreme hazard wildfire sites shall be in accordance with Sections R325.5.2 through R325.5.10.~~

~~**R335.5.2 Protection of Eaves.** Eaves, soffits, covered decks, and covered porch ceilings shall be protected on the exposed underside by ignition-resistant materials or by materials approved for a minimum of 1-hour fire-resistance-rated construction, 2-inch nominal dimension lumber, or 1-inch nominal fire-retardant-treated lumber, or 3/4 inch nominal fire-retardant-treated plywood, identified for exterior use and meeting the requirements of Sections R802.1.3 of the International Residential Code. Fascias are required and shall be protected on the backside by ignition-resistant materials or by materials approved for a minimum of 1-hour fire-resistance-rated construction or 2-inch nominal dimensional lumber.~~

~~**R325.5.3 Exterior Walls.** Exterior walls of buildings or structures shall be constructed with one of the following methods:~~

~~**1.** Noncombustible materials approved for a minimum of 1-hour fire-resistance-rated construction on the exterior side.~~

~~**2.** Approved noncombustible materials.~~

~~**3.** Heavy timber or log wall construction with a minimum member dimension or diameter of 6 inches.~~

~~**4.** Fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section R802.1.3 of the International Residential Code.~~

~~**5.** Ignition-resistant materials on the exterior side.~~

~~Such material shall extend from the top of the foundation to the underside of the roof sheathing.~~

~~**R325.5.4 Unenclosed Under Floor Protection.** Buildings or structures shall have all underfloor areas enclosed to the ground with exterior walls in accordance with Section R325.5.3.~~

~~**Exception:** Complete enclosure may be omitted where the underside of all exposed floors and all exposed structural columns, beams, and supporting walls are protected as required for exterior 1-hour fire-resistance-rated construction or heavy timber construction or fire-retardant-treated wood. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section R802.1.3 of the International Residential Code.~~

~~**R325.5.5 Decks, Appendages, and Projections.** Unenclosed accessory structures attached to buildings with habitable spaces and projections, such as decks, shall be a minimum of 1-hour fire resistance-rated construction, heavy timber construction or constructed of one of the following:~~

~~**1.** Approved noncombustible materials,~~

~~**2.** Fire-retardant-treated wood identified for exterior use and meeting the requirements of Section R802.1.3 of the International Residential Code, or~~

~~**3.** Ignition-resistant building materials in accordance with Section R325.3.~~

~~**R325.5.6 Exterior Widows and Glazing.** Exterior windows and glazing. Exterior windows, window walls, glazed doors, windows within exterior doors, and skylights shall be tempered glass, multi-layered glazing, glass block, or have a fire protection rating of not less than 20 minutes. Window frames and sashes must be metal, vinyl covered metal, solid wood, vinyl-covered solid wood or fiberglass.~~

~~**R325.5.7 Exterior Doors.** Exterior doors and garage doors shall be approved noncombustible construction, metal clad, solid core wood not less than 1 3/4 inches thick, or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with Section R325.5.6.~~

~~**R325.5.8 Vents.** Attic ventilation openings, foundation or under-floor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inch, or shall be designed and approved to prevent flame or ember penetration into the structure.~~

~~**R325.5.8.1 Vent locations.** Attic ventilation openings shall not be located in soffits, in eave overhangs, between rafters at eaves, or in other overhang areas. Gable end and dormer vents shall be located at least 10 feet from property lines. Underfloor ventilation openings shall be located as close to grade as practical.~~

~~**R325.5.9 Detached Accessory Structures.** Detached accessory structures located less than 50 feet from a building containing habitable space shall have exterior walls constructed in accordance with Section R325.5.3.~~

~~**R325.5.9.1 Underfloor Areas.** When the detached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have all underfloor areas enclosed to within 6 inches of the ground with exterior wall construction in accordance with Section R325.5.3 or underfloor protection in accordance with Section R325.5.4.~~

~~**Exception:** The enclosure shall not be required where the underside of all exposed floors and all exposed structural columns, beams, and supporting walls are protected as required for exterior 1-hour fire-resistance-rated construction or heavy timber construction or fire-retardant-treated wood on the exterior side. The fire-retardant-treated wood shall be labeled for exterior use and meet the requirements of Section R802.1.3 of the International Residential Code.~~

~~**R325.5.10 Defensible Space.** Individual buildings or structures on a property must be provided with a fuel modification zone of at least 100 ft. When additions requiring a permit occur, both existing and new structures must be provided with defensible space in accordance with this section. The fuel modification zone must be maintained at all times.~~

~~**Exception:** The fuel modification zone may extend to the property line if it is less than 100 ft. from the building or structure.~~

~~Vegetation, leaves, needles and dead organic material must be removed and kept clear of the structure. Trees may be located in the fuel modification zone provide crowns do not extend within 10 feet of other trees or within 10 feet of buildings or structures. Limbs located less than 6 ft. above the ground and dead wood must be removed. A weed barrier and gravel or crushed rock not less that ¾ applied at least 2 inches thick must be must be installed beneath decks, unenclosed floors, and around the perimeter of the building 3 feet beyond the exterior walls.~~

~~**R325.6 Restrictions for High Hazard Wildfire Sites.**~~

~~**R325.6.1 General.** Construction in high hazard wildfire sites shall be in accordance with Sections R325.6.2 through R325.6.10.~~

~~**R325.6.2**~~ **R327.4.5 Protection of Eaves.** The leading edge of the roof at the fascia must be finished with a metal drip edge so that no wood sheathing is exposed. Eaves, fascias, and soffits, covered decks or covered porch ceilings shall be protected on the enclosed underside by one of the following materials or methods:

1. *Noncombustible* materials.
2. *Ignition-resistant materials*.
3. Materials approved for a minimum of 1-hour fire-resistance-rated construction.
4. 2-inch-thick nominal dimension lumber.
5. 1-inch-thick nominal *fire-retardant-treated wood*.
6. ¾-inch-thick nominal *fire retardant-treated* plywood labeled for exterior use.
7. Any materials permitted by this code.

Exceptions:

1. Vinyl or plastic soffits, fascia or *trim* are not permitted.
2. Rafter tails or roof beam ends may be exposed if they are *heavy timber* having minimum dimensions not less than 6 inch nominal in width and not less than 8 inches nominal in depth.

~~**R325.5.3**~~ **R327.4.6 Exterior Walls.** Exterior walls of buildings or structures shall be constructed with one of the following methods:

1. *Noncombustible materials* approved for a minimum of 1-hour fire-resistance-rated construction on the exterior side.
2. Approved *noncombustible materials*.
3. *Heavy timber* or *log wall construction* ~~with a minimum member dimension or diameter of 6 inches~~.
4. *Fire-retardant-treated wood* labeled for exterior use on the exterior side. ~~The *fire-retardant-treated wood* shall be labeled for exterior use and meet the requirements of Section R802.1.3 of the International Residential Code~~.
5. *Ignition-resistant materials* on the exterior side.

Such material shall extend from the top of the foundation to the underside of the roof sheathing.

Exception: *Trim* is not required to meet the materials requirements for exterior walls.

Add a clarification that "unenclosed under floor" areas do not include decks, which are dealt with separately in the next section.

~~**R325.5.4**~~ **R327.4.7 Unenclosed Under Floor Protection.** Buildings or structures shall have all underfloor areas enclosed to the ground with exterior walls in accordance with Section ~~R325.5.3~~ R327.4.6. For decks, see Section R327.4.8.

Exception: Complete enclosure may be omitted where the underside of all exposed floors and all exposed structural columns, beams, and supporting walls are protected as required for exterior 1-hour fire-resistance-rated construction or *heavy timber construction* or *fire-retardant-treated wood* labeled for exterior use. ~~The *fire-retardant-treated wood* shall be labeled for exterior use and meet the requirements of Section R802.1.5 of the International Residential Code.~~

~~R325.5.5~~ R327.4.8 **Decks, Appendages, and Projections.** Decks and other unenclosed accessory structures attached to buildings shall be constructed of the following materials:

~~R325.6.5.1~~ R327.4.8.1 **Deck Surface:** *Non-combustible* material, approved wood thermoplastic composite lumber with an ASTM E84 flame-spread index no greater than 200, *ignition-resistant building materials* or any *approved* Class A roof assembly.

~~R325.6.5.2~~ R327.4.8.2 **Deck Framing:** Deck framing shall be constructed of one of the following:

1. 1-hour fire resistance-rated construction
2. *Heavy timber* construction.
3. Approved *noncombustible materials*.
4. *Fire-retardant-treated wood* labeled for exterior use.
5. *Ignition-resistant building materials*.
6. Wood with a minimum nominal thickness of at least 2 inches for joists and 4 inches for beams and columns or posts.

Revise this section to permit window frames of any material permitted by the code, other than unreinforced vinyl. The latest fire science and testing has shown that window glazing invariably fails before the frame loses its dimensional stability. In addition, the U-value requirements of the BuildSmart program and other window design and construction standards tend to assure a certain minimum quality and shape retention ability for window frames constructed of any material other than unreinforced vinyl.

~~R325.5.6~~ R327.4.9 **Exterior Windows and Glazing.** Exterior windows, window walls, glazed doors, windows within exterior doors, and skylights shall be tempered glass, multi-layered glazing, glass block, or have a fire protection rating of not less than 20 minutes. Unless they are part of a fire-rated assembly, ~~W~~window frames and sashes ~~must be metal, vinyl covered metal, solid wood, vinyl covered solid wood or fiberglass~~ may be of any material permitted by this code.

Exception: Windows with unreinforced vinyl frames or sashes are not permitted.

~~R325.6.7~~ R327.4.10 **Exterior Doors.** Exterior doors and garage doors shall be approved noncombustible construction, metal clad, solid core wood not less than 1 3/4 inches in thickness, or have a fire protection rating of not less than 20 minutes. Windows within doors and glazed doors shall be in accordance with Section R325.6.6.

Add an exception in accordance with the published 2015 International Wildland-Urban Interface Code (IWUIC).

Exception: Vehicle access doors.

~~R325.6.8~~ R327.4.11 **Vents.** Attic ventilation openings, foundation or under-floor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/8 inches or shall be designed and *approved* to prevent flame or ember penetration into the structure. Gable end and dormer vents shall be located at least ~~10~~ 15 feet from property lines and shall be designed and *approved* to prevent flame or ember penetration into the structure. Underfloor ventilation openings shall be located as close to grade as practical.

~~R325.5.9~~ R327.4.12 **Detached Accessory Structures.** Detached accessory structures ~~located less than 50 feet from a building containing habitable space~~ shall have exterior walls constructed in accordance with Section ~~R325.5.3~~ R327.4.6.

~~R325.5.9.1~~ R327.4.12.1 **Underfloor Areas.** Where the detached structure is located and constructed so that the structure or any portion thereof projects over a descending slope surface greater than 10 percent, the area below the structure shall have all underfloor areas enclosed to within 6 inches of the ground with exterior wall construction in accordance with Section ~~R325.5.3~~ R327.4.6 or underfloor protection in accordance with Section ~~R325.5.4~~ R327.4.7.

Exception: The enclosure shall not be required where the underside of all exposed floors and all exposed structural

columns, beams, and supporting walls are protected as required for exterior 1-hour fire-resistance-rated construction or *heavy timber construction* or *fire-retardant-treated wood* on the exterior side. The *fire-retardant-treated wood* shall be labeled for exterior use ~~and meet the requirements of Section R802.1.3 of the International Residential Code~~.

Revise the defensible space (vegetation modification) requirements to reference the latest defensible space publication from the CSFS, which is defined in Section R327.3. Exceptions are also added so that either the implementation of an approved wildfire mitigation plan (this "goes without saying" currently) or obtaining a certificate from the Wildfire Partners program (this is new) satisfies the defensible space requirements.

~~**R325.5.10**~~ **R327.4.13** ***Defensible space*****.** Individual buildings or structures on a property must be provided with a fuel modification zone ~~of at least 50 feet~~ in accordance with the *defensible space standard*. When additions requiring a permit occur, both existing and new structures must be provided with *defensible space* in accordance with this section. The fuel modification zone must be maintained at all times.

Exceptions: ~~The fuel modification zone may extend to the property line if it is less than 50 ft. from the building or structure.~~

1. The implementation and completion of an *approved wildfire mitigation plan* prior to final inspection approval for the project.

2. Participation in the *Wildfire Partners* program and the issuance of a *Wildfire Partners* certificate prior to final inspection approval for the project.

~~Vegetation, leaves, needles and dead organic material must be removed and kept clear of the structure. Trees may be located in the fuel modification zone provided crowns do not extend within 10 feet of other trees or within 10 feet of buildings or structures. Limbs located less than 6 ft. above the ground and dead wood must be removed.~~

Separate out the existing weed barrier and rock requirement, as it is one of our "best bang for the buck" provisions for reducing wildfire risk, and add additional requirements for extending beyond the driplines for decks, eaves and other overhangs. A simpler solution might be to change the existing requirement from 3 to 5 feet, which would probably catch the various overhangs and also matches the first 5-ft.-wide "zone" in the latest CSFS publication.

R327.4.13.1 Weed barrier and gravel or crushed rock. A weed barrier and gravel or crushed rock not less than ¾-inch in diameter applied at least 2 inches thick must be installed beneath decks, unenclosed floors, and around the perimeter of the building to extend at least 3 feet beyond the exterior walls~~, columns or posts~~ and at least 2 feet beyond the driplines of decks, bay windows and other eaves and overhangs.

Exception: Noncombustible surfaces, such as poured concrete or asphalt, or other *approved noncombustible* materials, such as a weed barrier and brick, concrete or stone pavers, may be used to satisfy this requirement.

~~**R325.7 Restrictions for Moderate Hazard Wildfire Sites.**~~

~~**R325.7.1 General.** Construction in moderate hazard wildfire site shall be in accordance with Sections R325.7.2 through R325.7.10.~~

~~**R325.7.2 Protection of Eaves.** Eaves, fascias, soffits, and covered deck or covered porch ceilings may be constructed of any material permitted by this code.~~

~~**R325.7.3 Exterior Walls.** Exterior walls of buildings or structures shall be constructed with one of the following methods:~~

~~**1.** Noncombustible materials approved for a minimum of 1 hour fire resistance rated construction on the exterior side.~~

~~**2.** Approved noncombustible materials.~~

~~**3.** Heavy timber or log wall construction with a minimum member dimension or diameter of 6 inches.~~

~~**4.** Fire retardant treated wood on the exterior side. The fire retardant treated wood shall be labeled for exterior use and~~

~~meet the requirements of Section R802.1.3 of the International Residential Code.~~

~~**5.** Ignition-resistant materials on the exterior side.~~
~~Such material shall extend from the top of the foundation to the underside of the roof sheathing.~~

~~**R325.7.4 Unenclosed Under Floor Protection.** Buildings or structures shall have all under floor areas enclosed to the ground with exterior walls in accordance with Section R325.7.3.~~

~~**Exception:** Enclosure may be omitted where the underside of all exposed floors and all exposed structural columns, beams, and supporting walls are protected as required for exterior 1-hour fire-resistance-rated construction, heavy timber construction or by ¾-inch thick plywood.~~

~~**R325.7.5 Decks, Appendages, and Projections.** Decks and other unenclosed accessory structures attached to buildings shall be constructed of the following materials:~~

~~**R325.7.5.1 Deck surface:** Noncombustible material, approved wood thermoplastic composite lumber with an ASTM E84 flame spread index no greater than 200, or materials meeting the ignition-resistant building material requirements defined in Section R325.4.5.~~
~~**R325.7.5.2 Deck framing:** Deck framing may be of any material permitted by this code.~~

~~**R325.7.6 Exterior Windows and Glazing.** Window glazing, frames, and sashes may be of any material permitted by the International Residential Code.~~

~~**R325.7.7 Exterior Doors.** Exteriors and garage doors may be of any material permitted by the International Building Code.~~

~~**R325.7.8 Vents.** Attic ventilation openings, soffits vents, foundation or under floor vents, or other ventilation openings in vertical exterior walls and vents through roofs shall not exceed 144 square inches each. Such vents shall be covered with noncombustible corrosion-resistant mesh with openings not to exceed 1/4 inch.~~

~~**R325.7.9 Detached Accessory Structures.** Detached accessory structures may be of any material permitted by the International Building Code.~~

~~**R325.7.10 Defensible Space.** Individual buildings or structures on a property must be provided with a fuel modification zone of at least 30 ft. When additions requiring a permit occur, both existing and new structures must be provided with defensible space in accordance with this section. The fuel modification zone must be maintained at all times..~~

~~**Exception:** The fuel modification zone may extend to the property line if it is less than 30 ft. from the building or structure.~~

~~Vegetation, leaves, needles and dead organic material must be removed and kept clear of the structure. Trees may be located in the fuel modification zone, provided crowns do not extend within 10 feet of other trees or within 10 feet of buildings or structures. Limbs located less than 6 ft. above the ground and dead wood must be removed. A weed barrier and gravel or crushed rock not less than ¾ inch in diameter applied at least 2 inches thick must be installed beneath decks, unenclosed floors, and around the perimeter of the building to extend 3 feet beyond the exterior walls, columns or posts.~~

~~R325.8~~ R327.5 Restrictions in Wildfire Zone 2.

Revise this section to match the wording in the 2015 International Wildland-Urban Interface Code. The minimum Class B roof covering requirement remains the same as in the current amendments.

~~R325.8.1~~ R327.5.1 Roof Covering. ~~Roof coverings for new buildings, additions, or materials used for reroofing shall be Class A or Class B materials. Wood roofing materials must be listed and tested as minimum Class B fire retardant material.~~ Roofs shall have at least a roof assembly that complies with a Class B rating when tested in accordance with ASTM E 108 or UL 790 or an *approved noncombustible roof* covering.

IRC SECTION ~~R326~~ R328
SOLAR PRE-WIRE OPTION

R326.1 Solar pre-wire option. In accordance with Section 1, Article 37.7 of title 38 of the Colorado Revised Statutes, every new single-family detached residence shall include one of the following:

1. A residential photovoltaic solar generation system or a residential solar thermal system, or both, or
2. Upgrades of wiring or plumbing, or both, installed by the builder to accommodate the future installation of a residential photovoltaic solar generation system or a residential solar thermal system, or both, or
3. A metallic chase or conduit, or both, constructed to allow ease of future installation of the necessary wiring or plumbing for a residential photovoltaic solar generation system or a residential solar thermal system, or both.

IRC SECTION ~~R327~~ R329
ELECTRIC VEHICLE CHARGING PRE-WIRE OPTION

R327.1 Electric vehicle charging pre-wire option. In addition to the one 125-volt receptacle outlet required for each car space by NEC Section 210.52(G)(1.), ~~E~~every new garage or carport that is accessory to a one- or two-family dwelling or townhouse shall include at least one of the following, installed in accordance with the requirements of Article 625 of the Electrical Code:

1. A Level 2 (240-volt) electric vehicle charging receptacle outlet, or
2. Upgraded wiring to accommodate the future installation of a Level 2 (240-volt) electric vehicle charging receptacle outlet, or
3. Electrical conduit to allow ease of future installation of a Level 2 (240-volt) electric vehicle charging receptacle outlet.

IRC CHAPTER 4
FOUNDATIONS

IRC SECTION R401
GENERAL

Delete the existing amendment to Section R401. Published IRC Sections R401, R405 and R406 contain provisions for geotechnical investigations, foundation drainage and foundation waterproofing.

~~**R401.2.1 Design Water Table.** The design water table shall be the measurement or prediction of the highest potential elevation of the water table at the building site where such measurement or prediction is based upon a report by a soils engineer or other qualified professional and where the accuracy of such measurement or prediction considers the average annual rain fall or other sources or factors which may influence fluctuations in the water table for the area in which the subject building site is located. In cases where the water table may be artificially lowered, the design water table must be determined subsequent to the completion of the sub drain system. Provisions must be made for maintenance of the sub drain system, funds for maintenance, and individual or group responsibility for on-going maintenance.~~

~~**R401.2.1.2 Requirements for Slabs Below Grade and Crawl Spaces.**~~

~~**R401.2.1.3 Slabs Below Grade.** Building permits for structures with slabs below grade shall not be issued unless the finished slab elevation is 6 inches or more above the design water table.~~

~~**R401.2.1.4 Peripheral Subdrain Required.** Structures with slabs below grade shall be provided with a peripheral subdrain which slopes to a sump or sumps, daylight, or other approved point. In each case the ultimate discharge point(s) for peripheral subdrains shall be approved during building permit application review by the County.~~

~~**R401.2.1.5 Crawl Spaces.** Crawl spaces shall be permitted only where the design water table is a minimum of 36 inches below the interior finished crawl space grade.~~

~~**R401.2.1.6 Alternative Designs.** Alternate designs and construction practices may be permitted where it is demonstrated to the reasonable satisfaction of the building official that they are in compliance with the intent of the criteria listed above.~~

R401.3 Drainage.

R401.3.1 Gutters and Downspouts. Gutters, downspouts, and downspout extensions are required on all buildings ~~in unincorporated Boulder County~~.

Exceptions:

1. Post framed buildings.
2. Buildings where, in the opinion of the building official, the gutters will become damaged by sliding snow.
3. Roofs with eaves or overhangs of six feet or greater.
4. Roofs that are constructed with internal roof drains
5. Buildings where an approved alternate means of drainage is designed by a soils engineer or other qualified registered design professional.

SECTION R408
UNDER-FLOOR SPACE

Delete this existing amendment. Published IRC Section R408.3 contains a reference to Section N1102.2.11.

~~For additional ventilation requirements for crawl spaces, See Chapter 11, Boulder County's BuildSmart program requirements.~~

IRC CHAPTER 8
ROOF-CEILING CONSTRUCTION

IRC SECTION R806
ROOF VENTILATION

R806.1 Roof ventilation. See the provisions of Section~~s R325.5.8, R325.6.8, and R325.7.8~~ R327.4.12 for attic ventilation in Wildfire Zone 1.

IRC CHAPTER 9
ROOF ASSEMBLIES

IRC SECTION R902
ROOF COVERING MATERIALS

Add a sentence to Section R902.1, as follows:

R902.1 Roof covering materials. See Section ~~R325.4.2~~ R327.4.1 for roof covering materials in Wildfire Zone 1 and Section R327.5.1 for roof covering materials in Wildfire Zone 2.

IRC SECTION R903
ROOF DRAINAGE

R903.4.1.1 Sizing of roof drains, scuppers, and downspouts. The rainfall amount to be used to size roof drainage components in ~~unincorporated Boulder County~~ shall be 2.4 inches per hour.

Note: This chapter includes modifications per the ICC 8-13-2015 published errata for Chapter 11

Part IV—Energy Conservation

CHAPTER 11

ENERGY EFFICIENCY

SECTION N1101
GENERAL

N1101.1 Scope. This chapter regulates the energy efficiency for the design and construction of buildings regulated by this code.

Exception: Federally-certified manufactured dwellings and state-certified factory-built dwellings.

Note: *The text of the following Sections N1101.2 through N1105 is extracted from the 2015 edition of the* International Energy Conservation Code—Residential Provisions *and has been editorially revised to conform to the scope and application of this code. The section numbers appearing in parenthesis after each section number are the section numbers of the corresponding text in the* International Energy Conservation Code—Residential Provisions.

Retain the existing amendment stating the intent and reasons behind the BuildSmart program.

N1101.2 Intent. This chapter shall regulate the design and construction of buildings for the effective use and conservation of energy over the useful life of each *building*. This chapter is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this objective. This chapter is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

This Chapter 11 implements the provisions of the "Boulder County BuildSmart" program. BuildSmart serves the County's stated goals of promoting and encouraging high performing, sustainable residential development and redevelopment in the unincorporated areas of Boulder County by: Promoting development that will create energy efficient structures that reduce both the production of greenhouse gases from residential buildings and the amount of material sent to landfills; Conserving water and other natural resources in the homebuilding process; and insuring proper indoor air quality. BuildSmart also furthers the goals and measures outlined in the Colorado Climate Action Plan and the County's Sustainable Energy Plan. The production and efficient use of energy will continue to play a central role in the future of Colorado and the nation as a whole. The development, production, and efficient use of renewable energy will advance the security, economic well-being, and public and environmental health of Colorado, as well as contributing to the energy independence of our nation. The 2015 revision to BuildSmart continues to include both a performance and a prescriptive option for compliance, providing additional flexibility in selection of the most cost-effective design for each project.

N1101.3 Compliance materials. The *building official* shall be permitted to approve specific computer software, worksheets, compliance manuals and other similar materials that meet the intent of this code.

N1101.4 Above code programs. The *building official* or other authority having jurisdiction shall be permitted to deem a national, state or local energy-efficiency program to exceed the energy efficiency required by this code. Buildings *approved* in writing by such an energy-efficiency program shall be considered in compliance with this code. The requirements identified as "mandatory" in this chapter, as applicable, shall be met.

N1101.5 Information on construction documents. 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 show 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 SHGCs.

3. Area-weighted *U*-factor and SHGC calculations.

4. Mechanical system design criteria

5. Mechanical and service water heating system and equipment types, sizes and efficiencies.

6. Equipment and system controls.

7. Duct sealing, duct and pipe insulation and location.

8. Air sealing details.

9. Area of Floor to area of Glass Ratio

N1101.5.1 (R103.2.1) Thermal envelope depiction. The building's thermal envelope shall be represented on the construction drawings.

N1101.6 Defined terms. The following words and terms shall, for the purposes of this chapter, have the meanings shown herein.

ABOVE-GRADE WALL. A wall more than 50 percent above grade and enclosing *conditioned space*. This includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and skylight shafts.

ACCESSIBLE. Admitting close approach as a result of not being guarded by locked doors, elevation or other effective means (see "Readily *accessible*").

ADDITION. An extension or increase in the *conditioned space* floor area or height of a building or structure.

AIR BARRIER. Material(s) assembled and joined together to provide a barrier to air leakage through the building envelope. An air barrier may be a single material or a combination of materials.

ALTERATION. Any construction, retrofit or renovation to an existing structure other than repair or addition that requires a permit. Also, a change in a building, electrical, gas, mechanical or plumbing system that involves an extension, addition or change to the arrangement, type or purpose of the original installation that requires a permit.

AUTOMATIC. Self-acting, operating by its own mechanism when actuated by some impersonal influence, as, for example, a change in current strength, pressure, temperature or mechanical configuration (see "Manual").

BASEMENT WALL. A wall 50 percent or more below grade and enclosing *conditioned space*.

BUILDING. Any structure used or intended for supporting or sheltering any use or occupancy, including any mechanical systems, service water heating systems and electric power and lighting systems located on the building site and supporting the building.

BUILDING SITE. A contiguous area of land that is under the ownership or control of one entity.

BUILDING THERMAL ENVELOPE. The basement walls, exterior walls, floor, roof and any other building elements that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

***C*-FACTOR (THERMAL CONDUCTANCE).** The coefficient of heat transmission (surface to surface) through a building component or assembly, equal to the time rate of heat flow per unit area and the unit temperature difference between the warm side and cold side surfaces (Btu/h · ft^2 · °F) [W/(m^2 ·K)].

CIRCULATING HOT WATER SYSTEM. A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to fixtures and back to the water-heating equipment.

CLIMATE ZONE. A geographical region based on climatic criteria as specified in this code.

CONDITIONED FLOOR AREA. The horizontal projection of the floors associated with the *conditioned space*. For the purposes of this chapter, the *conditioned floor area* shall be measured as the floor area within the inside face of the interior *air barrier*.

CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly heated or cooled or indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.

CONTINUOUS AIR BARRIER. A combination of materials and assemblies that restrict or prevent the passage of air through the building thermal envelope.

CONTINUOUS INSULATION (ci). Insulating material that is continuous across all structural members without thermal bridges other than fasteners and service openings. It is installed on the interior or exterior, or is integral to any opaque surface, of the building envelope.

CRAWL SPACE WALL. The opaque portion of a wall that encloses a crawl space and is partially or totally below grade.

CURTAIN WALL. Fenestration products used to create an external nonload-bearing wall that is designed to separate the exterior and interior environments.

DECONSTRUCTION. The dismantling of an existing building or portion thereof without the use of heavy machinery or the destruction of the materials. Deconstruction includes the salvage of materials from the existing structure for recycling, resale, or reuse as an alternative to sending them to a landfill. There are two types of deconstruction, structural and non-structural deconstruction.

DECONSTRUCTION, NON-STRUCTURAL. Non-Structural deconstruction (also referred to as soft-stripping) is the removal and reclaiming of the reusable non-structural components such as appliances, cabinets, doors, windows, flooring, fixtures, and finish materials.

DECONSTRUCTION, STRUCTURAL. Structural deconstruction is the removal and reclaiming of the reusable structural components of a building, such as walls, floors, and roofs.

DECONSTRUCTION PROFESSIONAL. A professional engaged in the deconstruction field.

DEMOLITION. The tearing down of an existing structure and the disposal of its components or materials without the implementation of deconstruction techniques.

DEMAND RECIRCULATION WATER SYSTEM. A water distribution system where pump(s) prime the service hot water piping with heated water upon demand for hot water.

DUCT. A tube or conduit utilized for conveying air. The air passages of self-contained systems are not to be construed as air ducts.

DUCT SYSTEM. A continuous passageway for the transmission of air that, in addition to ducts, includes duct fittings, dampers, plenums, fans and accessory air-handling equipment and appliances.

ENERGY ANALYSIS. A method for estimating the annual energy use of the *proposed design* and *standard reference design* based on estimates of energy use.

ENERGY COST. The total estimated annual cost for purchased energy for the building functions regulated by this code, including applicable demand charges.

ENERGY SIMULATION TOOL. An *approved* software program or calculation-based methodology that projects the annual energy use of a building.

ENERGYSMART, A Boulder County service that partners with local municipalities, non-profits, and utilities to assist county residents and businesses with improving a wide variety of sustainability related aspects of their living and work places, with particular emphasis on its energy usage. This program is principally funded by Boulder County with additional contributions from the City of Boulder, and is designed to stimulate local economic growth, increase energy efficiency and renewable energy investment in Boulder County, and reduce the climate affected impacts of the human environment. http://www.energysmartyes.com/

ENERGYSMART ASSESSMENT, An assessment analyzing your home's energy related attributes, provides the foundation for making cost-effective home improvements that will result in lower energy costs, increased occupant comfort, and a safer and healthier living environment. http://www.energysmartyes.com/

ENERGYSMART ADVISING, A one-on-one, personalized free service that is available to all EnergySmart participating homes and businesses. The Energy Advisor can help answer questions, aid in the prioritization of projects, connect customers with qualified contractors, find and apply for incentives and low-cost financing, and make upgrade process as smooth and hassle free as possible. http://www.energysmartyes.com/

ENERGY STAR (for homes), A national program from the U.S. Environmental Protection Agency (EPA) that certifies new homes for features related to energy efficiency, durability, and indoor air quality. https://www.energystar.gov/

ERI REFERENCE DESIGN. A version of the rated design that meets the minimum requirements of the 2006 *International Energy Conservation Code.*

EXTERIOR WALL. Walls including both above-grade walls and basement walls.

FENESTRATION. Products classified as either *vertical fenestration* or *skylights*.

FENESTRATION PRODUCT, SITE-BUILT. A fenestration designed to be made up of field-glazed or field-assembled units using specific factory cut or otherwise factory-formed framing and glazing units. Examples of site-built fenestration include storefront systems, curtain walls, and atrium roof systems.

FENESTRATION, VERTICAL. Windows (fixed or moveable), opaque doors, glazed doors, glazed block and combination opaque/glazed doors composed of glass or other transparent or translucent glazing materials and installed at a slope of a least 60 degrees (1.05 rad) from horizontal.

HEATED SLAB. Slab-on-grade construction in which the heating elements, hydronic tubing, or hot air distribution system is in contact with, or placed within or under, the slab.

HIGH-EFFICACY LAMPS. Compact fluorescent lamps, T-8 or smaller diameter linear fluorescent lamps, or lamps with a minimum efficacy of:

1. 60 lumens per watt for lamps over 40 watts;
2. 50 lumens per watt for lamps over 15 watts to 40 watts; and
3. 40 lumens per watt for lamps 15 watts or less.

HISTORIC BUILDING. Buildings that are listed in or eligible for listing in the National Register of Historic Places, or designated as historic under an appropriate state or local law.

INFILTRATION. The uncontrolled inward air leakage into a building caused by the pressure effects of wind or the effect of differences in the indoor and outdoor air density or both.

INSULATED SIDING. A type of continuous insulation with manufacturer-installed insulating material as an integral part of the cladding product having a minimum *R*-value of R-2 and is installed in a manner that places the insulation in direct contact with the surface that it is intended to insulate without gaps or voids.

INSULATING SHEATHING. An insulating board with a core material having a minimum *R*-value of R-2.

LEED, Leadership in Energy & Environmental Design is a green building certification program that encourages green building strategies and practices. To receive LEED certification, building projects satisfy prerequisites and earn points to achieve different levels of certification. LEED is a program of the US Green Building Council (USGBC). http://www.usgbc.org/leed

LIVING BUILDING CHALLENGE, A green building certification program administered by the International Living Future Institute. To be certified under this program, projects must meet a series of ambitious performance requirements. http://living-future.org

LOW-VOLTAGE LIGHTING. Lighting equipment powered through a transformer such as a cable conductor, a rail conductor and track lighting.

MANUAL. Capable of being operated by personal intervention (see "Automatic").

PASSIVE HOUSE, The term Passive House (Passivhaus in German) refers to a rigorous standard for energy efficiency in buildings. It results in buildings that require little energy for space heating or cooling. The certification program is administered by PHIUS, which is a 501(c)3 organization that provides research, technical standards, training, certification and design tools. http://www.phius.org

PROPOSED DESIGN. A description of the proposed building used to estimate annual energy use for determining compliance based on total building performance.

RATED DESIGN. A description of the proposed *building* used to determine the energy rating index.

READILY ACCESSIBLE. Capable of being reached quickly for operation, renewal or inspection without requiring those to whom ready access is requisite to climb over or remove obstacles or to resort to portable ladders or access equipment (see "*Accessible*").

RENEWABLE ENERGY SYSTEMS. Any renewable energy systems which meet the intent of the required on-site renewable energy offset required by other sections of this code, including solar thermal systems, solar photovoltaic electric systems, geothermal heating systems, wood- and pellet-burning stoves, boilers, or furnaces; small scale wind generation systems, and other similar systems.

REPAIR. The reconstruction or renewal of any part of an existing building for the purpose of its maintenance or to correct damage. For definitions applicable in Chapter 11, see Section N1101.9.

REROOFING. The process of recovering or replacing an existing *roof covering*. See "Roof recover" and "Roof replacement."

RESIDENTIAL BUILDING. For this chapter, includes detached one- and two-family dwellings and multiple single-family dwellings (townhouses) as well as Group R-2, R-3 and R-4 buildings three stories or less in height above grade plane.

ROOF RECOVER. The process of installing an additional *roof covering* over a prepared existing *roof covering* without removing the existing *roof covering*.

ROOF REPAIR. Reconstruction or renewal of any part of an existing roof for the purposes of its maintenance.

ROOF REPLACEMENT. The process of removing the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*.

R-VALUE (THERMAL RESISTANCE). The inverse of the time rate of heat flow through a body from one of its bounding surfaces to the other surface for a unit temperature difference between the two surfaces, under steady state conditions, per unit area ($h \cdot ft^2 \cdot °F/Btu$) [$(m^2 \cdot K)/W$].

SERVICE WATER HEATING. Supply of hot water for purposes other than comfort heating.

SKYLIGHT. Glass or other transparent or translucent glazing material installed at a slope of less than 60 degrees (1.05 rad) from horizontal. Glazing material in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls is included in this definition.

SOLAR HEAT GAIN COEFFICIENT (SHGC). The ratio of the solar heat gain entering the space through the fenestration assembly to the incident solar radiation. Solar heat gain includes directly transmitted solar heat and absorbed solar radiation that is then reradiated, conducted or convected into the space.

STANDARD REFERENCE DESIGN. A version of the *proposed design* that meets the minimum requirements of this code and is used to determine the maximum annual energy use requirement for compliance based on total building performance.

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

THERMAL ISOLATION. Physical and space conditioning separation from *conditioned space(s)*. The *conditioned space*(s) shall be controlled as separate zones for heating and cooling or conditioned by separate equipment.

THERMOSTAT. An automatic control device used to maintain temperature at a fixed or adjustable set point.

***U*-FACTOR (THERMAL TRANSMITTANCE).** The coefficient of heat transmission (air to air) through a building component or assembly, equal to the time rate of heat flow per unit area and unit temperature difference between the warm side and cold side air films (Btu/h · ft2 · °F) [W/(m2 · K)].

VENTILATION AIR. That portion of supply air that comes from outside (outdoors) plus any recirculated air that has been treated to maintain the desired quality of air within a designated space.

VISIBLE TRANSMITTANCE [VT]. The ratio of visible light entering the space through the fenestration product assembly to the incident visible light, Visible Transmittance, includes the effects of glazing material and frame and is expressed as a number between 0 and 1.

WHOLE HOUSE MECHANICAL VENTILATION SYSTEM. An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air with outdoor air when operating continuously or through a programmed intermittent schedule to satisfy the whole house ventilation rates.

ZERO ENERGY READY HOMES (ZERH), This national certification program from the U.S. Department of Energy (DOE) was previously known as the "Challenge Home" program. This program incorporates the basics of the Energy Star for Homes program, and adds additional requirements for water conservation, indoor air quality, and energy efficiency. http://energy.gov/eere/buildings/zero-energy-ready-home

ZONE. A space or group of spaces within a building with heating or cooling requirements that are sufficiently similar so that desired conditions can be maintained throughout using a single controlling device.

[N1101.7 Climate zones. ~~Climate zones from Figure N1101.7 or Table N1101.7 shall be used in determining the applicable requirements in Sections N1101 through N1111. Locations not in Table N1101.7 (outside the United States) shall be assigned a climate zone based on Section N101.10.2~~ All of unincorporated Boulder County shall be considered Climate Zone 5. For buildings located on sites that are above 5500 feet in elevation, alternate, more specific weather data may be accepted.

Tables N1101.7 (R301.1), "CLIMATE ZONES, MOISTURE REGIMES AND WARM-HUMID DESIGNATIONS BY STATE, COUNTY AND TERRITORY," and N1101.7.2, "INTERNATIONAL CLIMATE ZONE DEFINITIONS," are deleted.

~~**N1101.7.1 (R301.2) Warm humid counties.** Warm humid counties are identified in Table N1101.7 by an asterisk.~~

~~**N1101.7.2.2 (R301.3) International climate zones.** The climate zone for any location outside the United States shall be determined by applying Table N1101.7.2(1) and then Table N1101.7.2(2).~~

~~**N1101.8 (R301.4) Tropical climate zone.** The tropical climate zone shall be defined as:~~

~~1. Hawaii, Puerto Rico, Guam, American Samoa, US Virgin Islands, Commonwealth of Northern Mariana Islands; and~~

~~2. Islands in the area between the Tropic of Cancer and the Tropic of Capricorn.~~

N1101.9 Interior design conditions. The interior design temperatures used for heating and cooling load calculations shall be a maximum of 72°F (22°C) for heating and minimum of 75°F (24°C) for cooling.

N1101.10 Identification. Materials, systems and equipment shall be identified in a manner that will allow a determination of compliance with the applicable provisions of this code.

N1101.10.1 Building thermal envelope insulation. An *R*-value identification mark shall be applied by the manufacturer to each piece of *building thermal envelope* insulation 12 inches (305 mm) or greater in width. Alternately, the insulation installers shall provide a certification listing the type, manufacturer and *R*-value of insulation installed in each element of the *building thermal envelope*. For blown or sprayed insulation (fiberglass and cellulose), the initial installed thickness, settled thickness, settled *R*-value, installed density, coverage area and number of bags installed shall be *listed* on the certification.

For insulated siding, the *R*-value shall be labeled on the product's package and shall be *listed* on the certification. The insulation installer shall sign, date and post the certification in a conspicuous location on the job site.

N1101.10.1.1 Blown or sprayed roof/ceiling insulation. The thickness of blown-in or sprayed roof/ceiling insulation (fiberglass or cellulose) shall be written in inches (mm) on markers that are installed at least one for every 300 square feet (28 m^2) throughout the attic space. The markers shall be affixed to the trusses or joists and marked with the minimum initial installed thickness with numbers not less than 1 inch (25 mm) in height. Each marker shall face the attic access opening. Spray polyurethane foam thickness and installed *R*-value shall be *listed* on certification provided by the insulation installer.

N1101.10.2 Insulation mark installation. Insulating materials shall be installed such that the manufacturer's *R*-value mark is readily observable upon inspection.

N1101.10.3 Fenestration product rating. *U*-factors of fenestration products (windows, doors and skylights) shall be determined in accordance with NFRC 100.

Exception: Where required, garage door *U*-factors shall be determined in accordance with either NFRC 100 or ANSI/DASMA 105.

U-factors shall be determined by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Products lacking such a labeled *U*-factor shall be assigned a default *U*-factor from Table N1101.10.3(1) or N1101.10.3(2). The solar heat gain coefficient (SHGC) and visible transmittance (VT) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer. Products lacking such a labeled SHGC or VT shall be assigned a default SHGC or VT from Table N1101.10.3(3).

TABLE N1101.10.3(1]
DEFAULT GLAZED FENESTRATION *U*-FACTORS

FRAME TYPE	SINGLE PANE	DOUBLE PANE	SKYLIGHT	
			Single	Double
Metal	1.20	0.80	2.00	1.30
Metal with Thermal Break	1.10	0.65	1.90	1.10
Nonmetal or Metal Clad	0.95	0.55	1.75	1.05
Glazed Block	0.60			

TABLE N1101.10.3(2)
DEFAULT DOOR *U*-FACTORS

DOOR TYPE	*U*-FACTOR
Uninsulated Metal	1.20
Insulated Metal	0.60
Wood	0.50
Insulated, nonmetal edge, max 45% glazing, any glazing double pane	0.35

TABLE N1101.10.3(3)
DEFAULT GLAZED FENESTRATION SHGC AND VT

	SINGLE GLAZED		DOUBLE GLAZED		GLAZED BLOCK
	Clear	Tinted	Clear	Tinted	
SHGC	0.8	0.7	0.7	0.6	0.6
VT	0.6	0.3	0.6	0.3	0.6

N1101.10.4 Insulation product rating. The thermal resistance (*R*-value) of insulation shall be determined in accordance with the U.S. Federal Trade Commission *R*-value rule (CFR Title 16, Part 460) in units of h × ft2 × °F/Btu at a mean temperature of 75°F (24°C).

N1101.10.4.1 Insulated siding. The thermal resistance (*R*-value) of insulated siding shall be determined in accordance with ASTM C 1363. Installation for testing shall be in accordance with the manufacturer's installation instructions.

N1101.11 Installation. All materials, systems and equipment shall be installed in accordance with the manufacturer's instructions and this code.

N1101.11.1 Protection of exposed foundation insulation. Insulation applied to the exterior of basement walls, crawlspace walls and the perimeter of slab-on-grade floors shall have a rigid, opaque and weather-resistant protective covering to prevent the degradation of the insulation's thermal performance. The protective covering shall cover the exposed exterior insulation and extend not less than 6 inches (153 mm) below grade.

N1101.12 Maintenance information. Maintenance instructions shall be furnished for equipment and systems that require preventive maintenance. Required regular maintenance actions shall be clearly stated and incorporated on a readily accessible label. The label shall include the title or publication number for the operation and maintenance manual for that particular model and type of product.

N1101.13 Compliance. Projects shall comply with one of the following:

~~Sections N1101.14 through N1104.~~

~~Section N1105 and the provisions of Sections N1101.14 through N1104 labeled "Mandatory."~~

~~An energy rating index (ERI) approach in Section N1106.~~

N1101.13.1 (R401.2.1) New Homes. New homes shall comply with the requirements of Figure N1101.13.1 (R R401.2.1) "Options for New Homes".

N1101.13.2 (R401.2.2) Additions. Additions shall comply with the requirements of Figure N1101.13.2 (R401.2.2) "Options for Additions"

N1101.13.3 (R401.2.3) Alterations, Remodels, and Repairs. Alterations, Remodels, and Repairs shall comply with the requirements of Figure N1101.13.3 (R401.2.3) "Options for Alterations, Remodels, and Repairs".

~~**N1101.13.1 (R401.2.1) Tropical zone.** *Residential buildings* in the tropical zone at elevations below 2,400 feet (731.5 m) above sea level shall be deemed to comply with this chapter where the following conditions are met:~~

1. ~~Not more than one-half of the *occupied* space is air conditioned.~~
2. ~~The *occupied* space is not heated.~~
3. ~~Solar, wind or other renewable energy source supplies not less than 80 percent of the energy for service water heating.~~
4. ~~Glazing in *conditioned* space has a *solar heat gain coefficient* of less than or equal to 0.40, or has an overhang with a projection factor equal to or greater than 0.30.~~
5. ~~Permanently installed lighting is in accordance with Section N1104.~~
6. ~~The exterior roof surface complies with one of the options in Table C402.2.1.1 of the *International Energy Conservation Code*, or the roof/ceiling has insulation with an *R*-value of R-15 or greater. If present, attics above the insulation are vented and attics below the insulation are unvented.~~
7. ~~Roof surfaces have a minimum slope of 1/4 inch (6.4 mm) per foot of run. The finished roof does not have water accumulation areas.~~

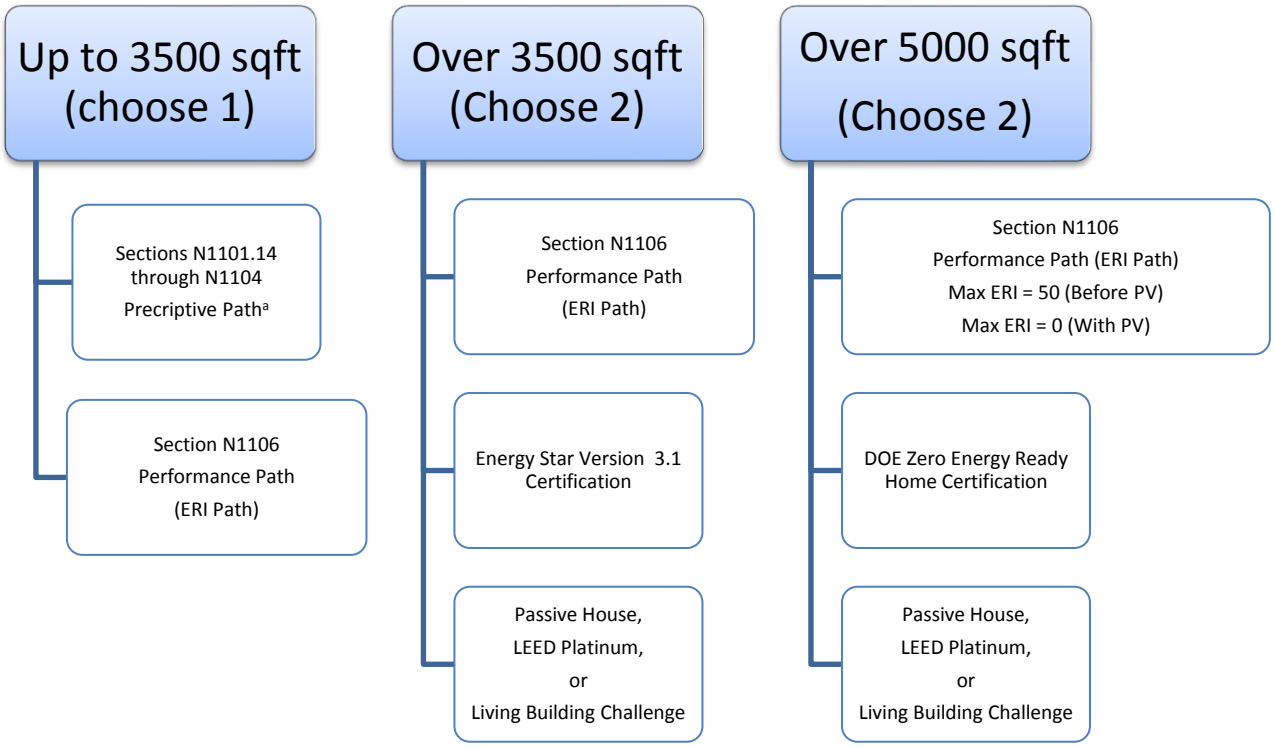
~~8. Operable fenestration provides ventilation area equal to not less than 14 percent of the floor area in each room. Alternatively, equivalent ventilation is provided by a ventilation fan.~~

~~9. Bedrooms with exterior walls facing two different directions have operable fenestration on exterior walls facing two directions.~~

~~10. Interior doors to bedrooms are capable of being secured in the open position.~~

11. ~~A ceiling fan or ceiling fan rough-in is provided for bedrooms and the largest space that is not used as a bedroom.~~

Figure N1101.13.1 Options for New Homes[a,b,c]:



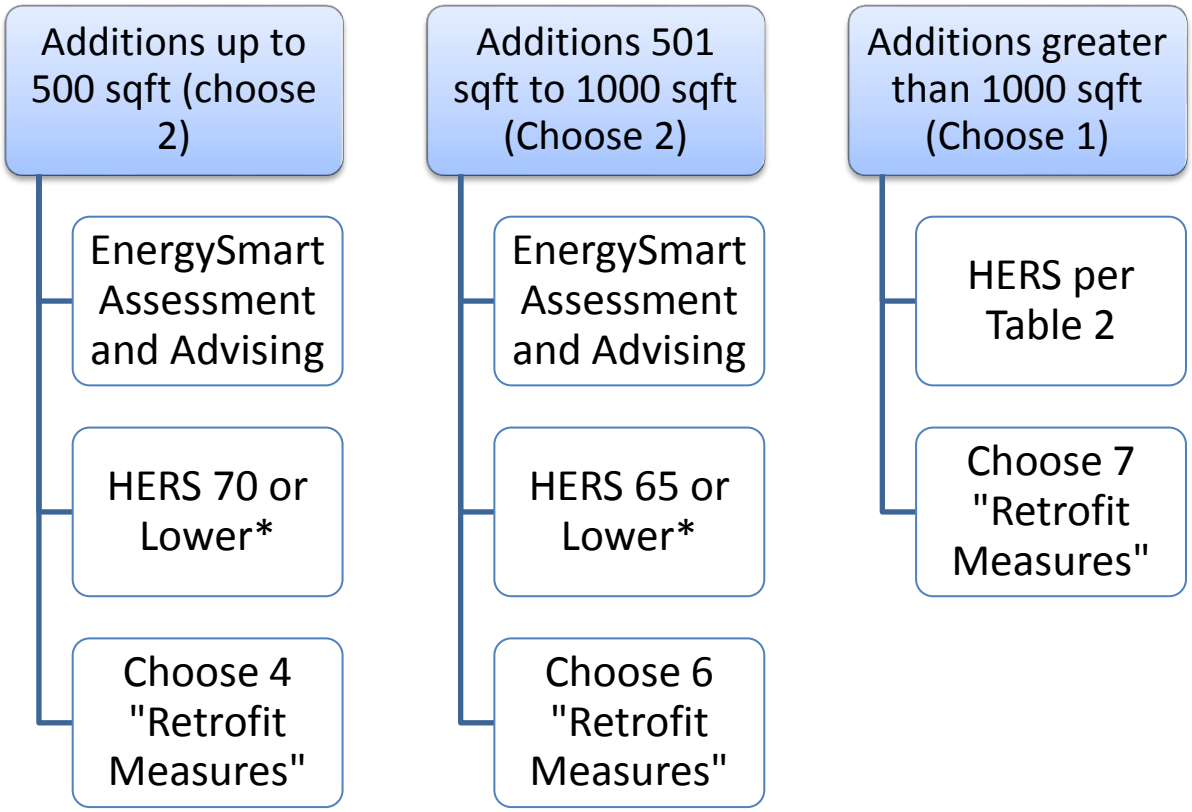
a. Buildings with glazing to floor area ratios that exceed 18% may not use the prescriptive path.

Exception: Passive solar designs in which 50% or more of the total glazing faces south.

b. The energy efficiency requirements of BuildSmart are deemed to be met by buildings with an annual space conditioning requirement of less than 5kBtu/sqft/year.

c. When unconditioned floor area is being converted to *conditioned floor area* (except for basement finishes), the project is to meet the requirements for an addition.

Figure N1101.13.2 Options for Additions:[a,b]



a. All new building components must meet the requirements of Section N1102.

Exception: Homes using the ERI (HERS) pathway.

b. For additions with greater than 200 square feet of floor area resulting in dwellings with greater than 3,500 square feet of *conditioned floor area*, existing plus proposed, Figure N1101.13.2 must be used.

FIGURE N1101.13.2 OPTIONS FOR ADDITIONS (CONTINUED)

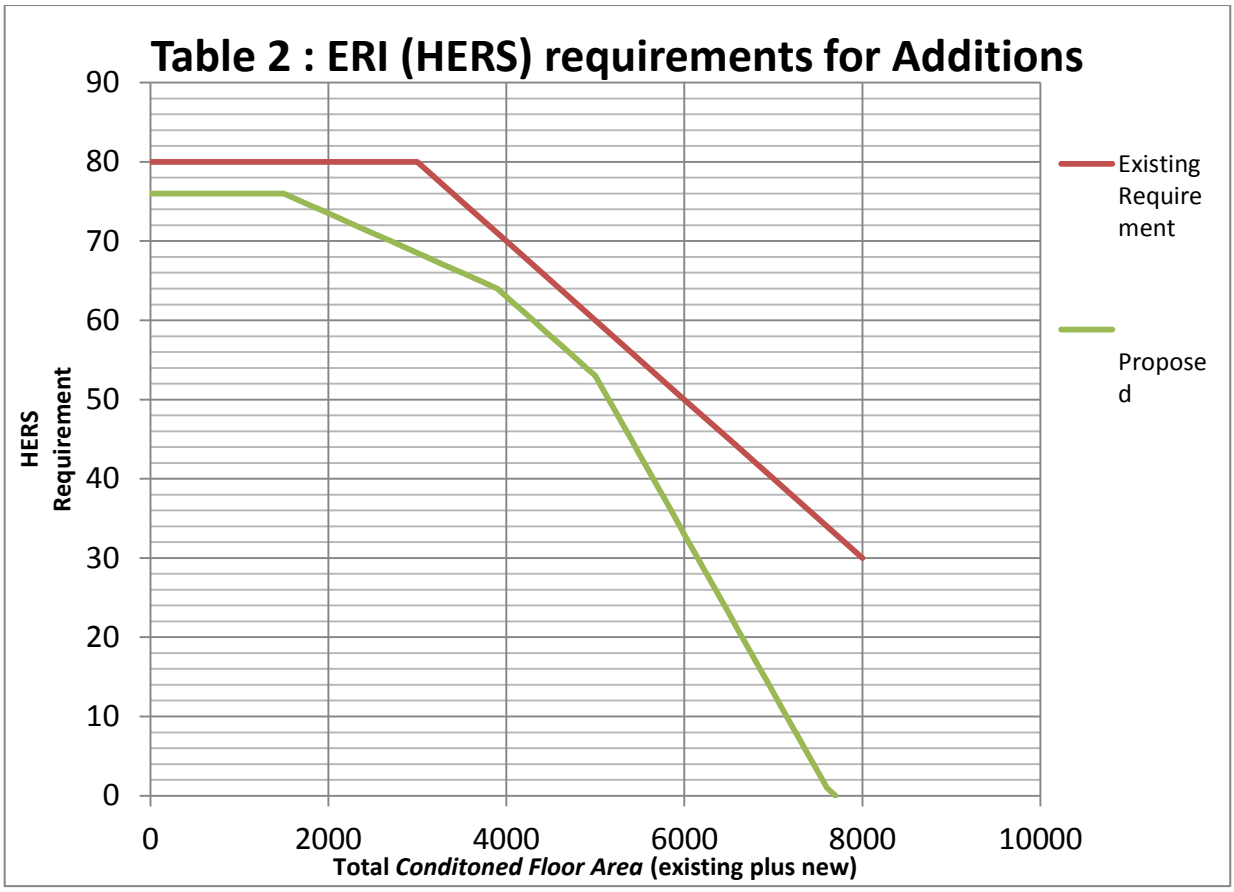


Figure N1101.13.2 Options for Additions (Continued): ERI (HERS) Requirements for Additions

SqFt	Maximum ERI*
0	76
1500	76
1600	76
1700	75
1800	75
1900	74
2000	74
2100	73
2200	73
2300	72
2400	72
2500	71
2600	71
2700	70
2800	70
2900	69
3000	69
3100	68
3200	68
3300	67
3400	67

SqFt	Maximum ERI*
3500	66
3600	66
3700	65
3800	65
3900	64
4000	63
4100	62
4200	61
4300	60
4400	59
4500	58
4600	57
4700	56
4800	55
4900	54
5000	53
5100	51
5200	49
5300	47
5400	45
5500	43

SqFt	Maximum ERI*
5600	41
5700	39
5800	37
5900	35
6000	33
6100	31
6200	29
6300	27
6400	25
6500	23
6600	21
6700	19
6800	17
6900	15
7000	13
7100	11
7200	9
7300	7
7400	5
7500	3
7600	1
7700	0

*Conditioned Floor Area will be rounded to the nearest 100 sqft.

Figure N1101.13.3 Options for Alterations, Remodels, and Repairs

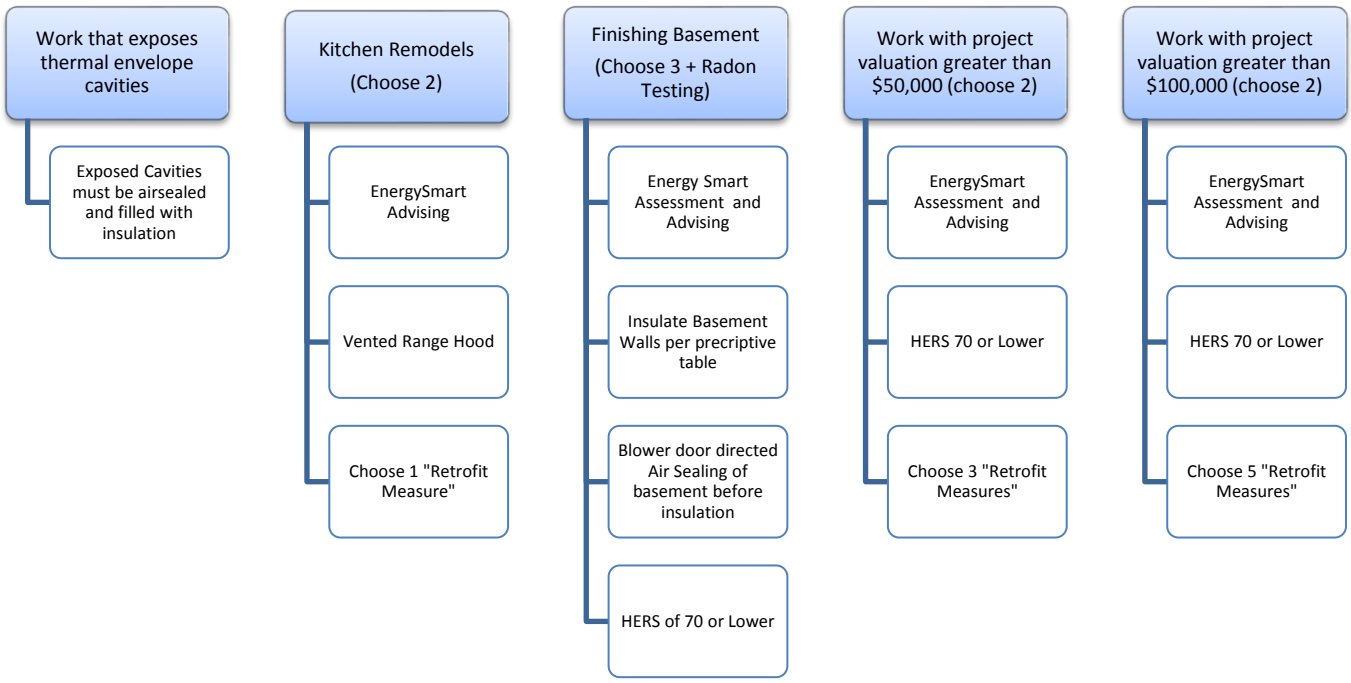
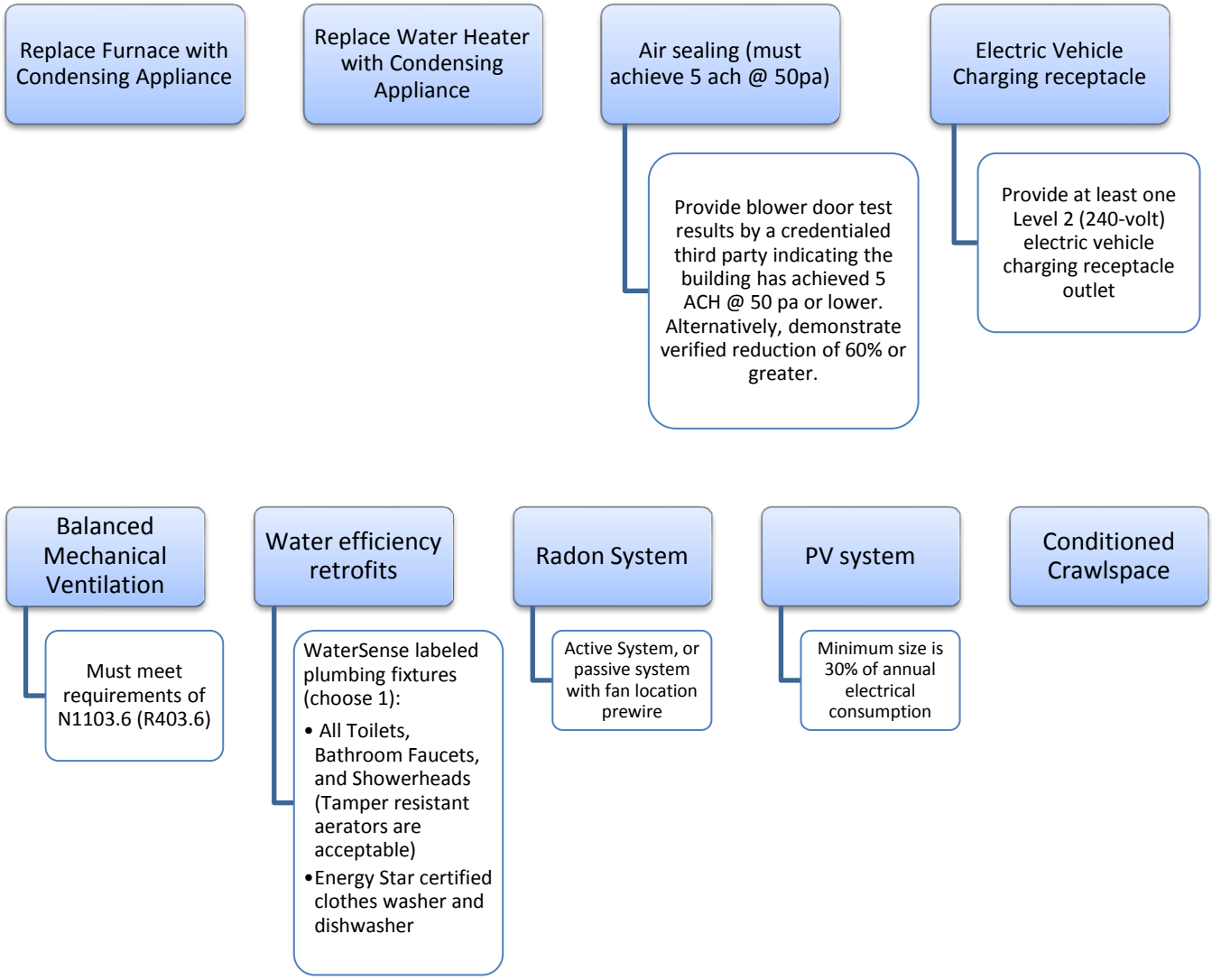


Figure N1101.13.3 Options for Alterations, Remodels, and Repairs (Continued): Retrofit Measures:



N1101.14 Certificate (Mandatory). A permanent certificate shall be completed by the builder or registered design professional and posted on a wall in the space where the furnace is located, a utility room or an approved location inside the building. Where located on an electrical panel, the certificate shall not cover or obstruct the visibility of the circuit directory label, service disconnect label or other required labels. The certificate shall list the predominant *R*-values of insulation installed in or on ceiling/roof, walls, foundation (slab, *basement wall*, crawl space wall and/or floor) and ducts outside conditioned spaces; *U*-factors for fenestration and the solar heat gain coefficient (SHGC) of fenestration, and the results from any required duct system and building envelope air leakage testing done on the building. Where there is more than one value for each component, the certificate shall list the value covering the largest area. The certificate shall list the types and efficiencies of heating, cooling and service water heating equipment. Where a gas-fired unvented room heater, electric furnace, or baseboard electric heater is installed in the residence, the certificate shall list "gas-fired unvented room heater," "electric furnace" or "baseboard electric heater," as appropriate. An efficiency shall not be *listed* for gas-fired unvented room heaters, electric furnaces or electric baseboard heaters**.** Where photovoltaic systems are present, the certificate shall indicate the number of panels, the nameplate rating of the system (kW), and the anticipated average annual output (kWh) of the system.

Add new sections to incorporate the existing BuildSmart deconstruction, construction jobsite waste reduction and recycling and indoor water conservation requirements.

N1101.15 Deconstruction (Mandatory)

N1101.15.1 Deconstruction. All existing buildings and portions thereof requiring removal of building materials must be deconstructed as defined in this chapter. Demolition is not permitted.

N1101.15.2 Penalty. Buildings that are demolished or partially demolished rather than deconstructed will, at the discretion of the Building Official, be issued a Stop Work notice for a period not exceeding 30 days.

1101.15.3 Documentation of Intent to Deconstruct. Documentation of intent to deconstruct consisting of a deconstruction plan, a written description of deconstruction work, or the County Deconstruction Checklist must be provided at building permit application. The documentation of intent to deconstruct must include: the name of the Deconstruction Contractor, a list of the materials to be recovered, donated, or reused, and the destination of the materials. The documentation must include both Nonstructural Deconstruction and Structural Deconstruction. Items which must be donated, sold, or re-used include: cabinets, dimensional lumber, flooring, and solid core doors.

N1101.15.4 Verification of deconstruction of a structure. The completion of deconstruction as approved on the deconstruction plan must be verified by the Building Division. The owner or deconstruction contractor shall provide written verification of deconstruction by means of receipts or a written log, maintained by the homeowner or general contractor, which includes the volume or weight of materials and the destination where they were transported to the Building Division office. Verification must be received prior to scheduling the rough inspections.

N1101.16 Construction Jobsite Waste Reduction and Recycling (Mandatory). All construction jobsite waste must be recycled including wood, scrap metal, cardboard, and concrete. Labeled containers must be provided at the construction-site for use in capturing recyclable material. A mixed load container may be used if that container is being sent to a waste/recycling center that will verify the weight of recycled material recovered from that mixed load.

N1101.16.1 Documentation of Intent to Recycle. Documentation of intent to recycle which consists of a recycling plan, a written description of recycling activity, or the submittal of the County Recycling Checklist must be provided at building permit application. The documentation must clearly show how the requirements of Section 1101.15 will be met and must specify the locations of recycling containers and the destination where material will be recycled.

N1101.16.2 Verification. Field inspection will be made by the Boulder County Building Division during the construction process to assure that recycling containers have been placed on-site. Prior to the final inspection, documentation must be provided to the Building Division office by the owner or waste/recycling contractor indicating the weight or volume of materials diverted from the waste stream. Materials that must be recycled include: appliances, concrete, metals, cardboard, and wood (except pressure treated or painted wood), and thermostats and other devices containing mercury. Other materials which are accepted by the waste/recycling contractor must also be recycled.

N1101.17 Indoor water conservation (Mandatory). New and replacement bathroom sink faucets, shower heads, toilets, and urinal must be labeled as meeting EPA Water Sense (www.epa.gov/WaterSense/) criteria.

Exception: Showerheads with a maximum flow of 2.0 gpm, urinals with a flush rate of .5 gallons per flush.

SECTION N1102
BUILDING THERMAL ENVELOPE

N1102.1 General (Prescriptive). The *building thermal envelope* shall meet the requirements of Sections N1102.1.1 through N1102.1.4.

Exception: The following low energy buildings, or portions thereof, separated from the remainder of the building by *building thermal envelope* assemblies complying with this section shall be exempt from the *building thermal envelope* provisions of Section N1102.

1. Those with a peak design rate of energy usage less than 3.4 Btu/h · ft^2 (10.7 W/m^2) or 1.0 watt/ft^2 of floor area for space conditioning purposes.

2. Those that do not contain *conditioned space*.

N1102.1.1 Vapor retarder. Wall assemblies in the *building thermal envelope* shall comply with the vapor retarder requirements of Section R702.7.

N1102.1.2 Insulation and fenestration criteria. The *building thermal envelope* shall meet the requirements of Table N1102.1.2 based on the climate zone specified in Section N1101.7.

Table N1102.1.2 is modified to delete all climate zones except "5 and Marine 4" and retain the values in the current Boulder County Table N1102.1.

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

CLIMATE ZONE	FENESTRTION *U*-FACTOR[b]	SKY-LIGHT[b] *U*-FACTOR	GLAZED FENESTRATION SHGC[b,~~e~~]	CEILING *R*-VALUE	WOOD FRAME WALL *R*-VALUE	MASS WALL *R*-VALUE[i,j]	FLOOR *R*-VALUE	BASE-MENT[c] WALL *R*-VALUE	SLAB[d] *R*-VALUE & DEPTH	CRAWL SPACE[c] WALL *R*-VALUE
Boulder County (modified 5 & Marine 4)	0.30	~~.45~~ 0.43	NR	54	19 + ~~10~~5[h,k]	18/24	42[g]	15/20	15, 3 ft	15/20

For SI: 1 foot = 304.8 mm.
a. *R*-values are minimums. *U*-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed *R*-value of the insulation shall not be less than the *R*-value specified in the table.
b. The fenestration *U*-factor column excludes skylights. The SHGC column applies to all glazed fenestration.
Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.
c. "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.
d. R-~~5~~10 shall be added to the required slab edge *R*-values for heated slabs. ~~Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Zones 1 through 3 for heated slabs.~~
~~e. There are no SHGC requirements in the Marine Zone.~~ Not Used.
~~f. Basement wall insulation is not required in warm-humid locations as defined by Figure N1101.10 and Table N1101.10.~~ Not Used.
g. ~~Or insulation sufficient to fill the framing cavity, R-19 minimum.~~ Floors over conditioned space are exempt from this requirement.
h. The first value is cavity insulation, the second value is continuous insulation, so "~~13~~19+5" means R-~~13~~19 cavity insulation plus R-5 continuous insulation.

i. The second *R*-value applies when more than half the insulation is on the interior of the mass wall.
j. For Strawbale Construction See Appendix S: Strawbale Construction, Section AS108: Thermal Insulation
k. To reduce potential for condensation within the wall assembly, it is recommended that exterior continuous insulation be a minimum of R-7.5. See Table R702.7.1.
l. Garages and shops that contain conditioned floor area that are equipped with overhead doors must have fully weather stripped overhead doors with a minimum R-value of 13. Such doors must be weather stripped at the top, sides, bottom, and between the panels.

N1102.1.3 *R*-value computation. Insulation material used in layers, such as framing cavity insulation, or continuous insulation shall be summed to compute the corresponding component *R*-value. The manufacturer's settled *R*-value shall be used for blown insulation.

Computed *R*-values shall not include an *R*-value for other building materials or air films. Where insulated siding is used for the purpose of complying with the continuous insulation requirements of Table N1102.1.2, the manufacturer's labeled *R*-value for insulated siding shall be reduced by R-0.6 unless typical installation includes air gaps between siding and substrate. If such gaps exist, R-value shall be reduced by 60% or R-0.6 (whichever is greater).

N1102.1.4 *U*-factor alternative. An assembly with a *U*-factor equal to or less than that specified in Table N1102.1.4 shall be permitted as an alternative to the *R*-value in Table N1102.1.2.

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

CLIMATE ZONE	FENESTRATION *U*-FACTOR	SKYLIGHT *U*-FACTOR	CEILING *U*-FACTOR	FRAME WALL *U*-FACTOR	MASS WALL *U*-FACTOR[b]	FLOOR *U*-FACTOR	BASEMENT WALL *U*-FACTOR	CRAWL SPACE WALL *U*-FACTOR
Boulder County (modified 5 & Marine 4)	0.30	~~0.45~~ 0.43	0.020	~~0.039~~ 0.045	0.056	0.026	0.067/0.05	0.05

a. Nonfenestration *U*-factors shall be obtained from measurement, calculation or an approved source.
b. When more than half the insulation is on the interior, the mass wall *U*-factor~~s~~ shall be a maximum of 0.039 ~~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 00.17 in Zone 1, 0.14 in Zone 2, 0.12 in Zone 3, 0.087 in Zone 4 except Marine, .057 in Zones 6 through 8~~.
~~c. Basement wall *U* factor of 0.360 in warm-humid locations as defined by Figure N1101.10 (R301.1) and Table N1101.10 (R301.1).~~

N1102.1.5 Total UA alternative. If the total *building thermal envelope* UA (sum of *U*-factor times assembly area) is less than or equal to the total UA resulting from using the *U*-factors in Table N1102.1.4 (multiplied by the same assembly area as in the proposed building), the building shall be considered in compliance with Table N1102.1.2. The UA calculation shall be done using a method consistent with the ASHRAE *Handbook of Fundamentals* and shall include the thermal bridging effects of framing materials. ~~The SHGC requirements shall be met in addition to UA compliance.~~

N1102.2 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.

N1102.2.1 Ceilings with attic spaces. ~~Where Section R1102.1.2 would require R-38 insulation in the ceiling, installing R-30 over 100 percent of the ceiling area requiring insulation shall be deemed to satisfy the requirement for R-38 wherever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, where Section R1102.1.2 would require R-49 insulation in the ceiling, installing R-38 over 100 percent of the ceiling area requiring insulation shall be deemed to satisfy the requirement for R-49 insulation wherever the full height of uncompressed R-38 insulation extends over the wall top plate at the eaves. This reduction shall not apply to the *U* factor alternative approach in Section R1102.1.4 and the total UA alternative in Section R1102.1.5.~~ This section has been deleted and is non-applicable.

N1102.2.2 Ceilings without attic spaces. ~~Where Section N1102.1.2 would require insulation levels above R-30 and the design of the roof/ceiling assembly does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section N1102.1.2 shall be limited to 500 square feet (46 m2) or 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the *U* factor alternative approach in Section N1102.1.4 and the total UA alternative in Section N1102.1.5.~~ This section has been deleted and is non-applicable.

N1102.2.3 Eave baffle. For air-permeable insulations in vented attics, a baffle shall be installed adjacent to soffit and eave vents. Baffles shall maintain an opening equal or greater than the size of the vent. The baffle shall extend over the top of the attic insulation. The baffle shall be permitted to be any solid material.

N1102.2.4 Access hatches and doors. Access doors from conditioned spaces to unconditioned spaces such as attics and crawl spaces shall be weather-stripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood-framed or equivalent baffle or retainer is required to be provided when loose-fill insulation is installed, the purpose of which is to prevent the loose-fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed *R*-value of the loose-fill insulation.

Exception: Vertical doors that provide access from conditioned to unconditioned spaces shall be permitted to meet the fenestration requirements of Table R1102.1.2 based on the applicable climate zone specified in Chapter 3.

N1102.2.5 Mass walls. Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs, or any other walls having a heat capacity greater than or equal to 6 Btu/ft^2 × °F (123 kJ/m^2 × K).

N1102.2.6 Steel-frame ceilings, walls, and floors. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of Table N1102.2.6 or shall meet the *U*-factor requirements of Table N1102.1.4. The calculation of the *U*-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.

~~**TABLE N1102.2.6 (R402.2.6)**~~
~~**STEEL-FRAME CEILING, WALL AND FLOOR INSULATION**~~
~~**(*R*-VALUE)**~~

Table N1102.2.6 is deleted.

N1102.2.7 (R402.2.7) Walls with partial structural sheathing. ~~Where Section R1102.1.2 would require continuous insulation on exterior walls and structural sheathing covers 40 percent or less of the gross area of all exterior walls, the continuous insulation *R*-value shall be permitted to be reduced by an amount necessary to result in a consistent total sheathing thickness, but not more than R-3, on areas of the walls covered by structural sheathing. This reduction shall not apply to the *U*-factor alternative approach in Section R1102.1.4 and the total UA alternative in Section R1102.1.5.~~ This section has been deleted and is non-applicable.

N1102.2.8 Floors. Floor framing-cavity insulation shall be installed to maintain permanent contact with the underside of the subfloor decking.

Exception: The floor framing-cavity insulation shall be permitted to be in contact with the topside of sheathing or continuous insulation installed on the bottom side of floor framing where combined with insulation that meets or exceeds the minimum wood frame wall *R*-value in Table 1102.1.2 and that extends from the bottom to the top of all perimeter floor framing members.

N1102.2.9 Basement walls. Walls associated with conditioned basements shall be insulated from the top of the *basement wall* down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections N1102.1.2 and N1102.2.8.

N1102.2.10 Slab-on-grade floors. Slab-ongrade 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.

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

N1102.2.12 Masonry veneer. Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer.

N1102.2.13 Sunroom insulation. S*unrooms* enclosing conditioned spaces shall meet the insulation requirements of this code.

~~**Exception:** For *sunrooms* with *thermal isolation*, and enclosing conditioned spaces, the following exceptions to the insulation *requirements* of this code shall apply:~~

~~1. The minimum ceiling insulation *R* values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8.~~

~~2. The minimum wall *R* value shall be R-13 in all *climate zones*. Walls separating a *sunroom* with a *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.~~

N1102.3 Fenestration (Prescriptive). In addition to the requirements of Section N1102, fenestration shall comply with Sections N1102.3.1 and N1102.3.5.

N1102.3.1 *U*-factor. An area-weighted average of fenestration products shall be permitted to satisfy the *U*-factor requirements.

N1102.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50-percent glazed shall be permitted to satisfy the SHGC requirements.

Dynamic glazing shall be permitted to satisfy the SHGC requirements of Table R1102.1.2 provided the ratio of the higher to lower labeled SHGC is greater than or equal to 2.4, and the *dynamic glazing* is automatically controlled to modulate the amount of solar gain into the space in multiple steps. *Dynamic glazing* shall be considered separately from other fenestration, and area-weighted averaging with other fenestration that is not dynamic glazing shall not be permitted.

> **Exception:** *Dynamic glazing* is not required to comply with this section when both the lower and higher labeled SHGC already comply with the requirements of Table N1102.1.2.

N1102.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4 m^2) of glazed fenestration per dwelling unit shall be permitted to be exempt from *U*-factor and SHGC requirements in Section N1102.1.2. This exemption shall not apply to the *U*-factor alternative approach in Section N1102.1.4 and the total UA alternative in Section N1102.1.5.

N1102.3.4 Opaque door exemption. One side-hinged opaque door assembly up to 24 square feet (2.22 m^2) in area is exempted from the *U*-factor requirement in Section N1102.1.2. This exemption shall not apply to the *U*-factor alternative approach in Section N1102.1.4 and the total UA alternative in Section N1102.1.5.

N1102.3.5 Sunroom fenestration. S*unrooms* enclosing *conditioned space* shall meet the fenestration requirements of this code.

> ~~**Exception:** For *sunrooms* with *thermal isolation* and enclosing *conditioned space* in *Climate Zones* 2 through 8, the maximum fenestration *U*-factor shall be 0.45 and the maximum skylight *U*-factor shall be 0.70. New fenestration separating the *sunroom* with *thermal isolation* from *conditioned space* shall meet the *building thermal envelope* requirements of this code.~~

N1102.4 Air leakage (Mandatory). The *building thermal envelope* shall be constructed to limit air leakage in accordance with the requirements of Sections ~~R~~N1102.4.1 through ~~R1102.4.4~~N1102.4.5 [per errata].

N1102.4.1 Building thermal envelope. The *building thermal envelope* shall comply with Sections N1102.4.1.1 and N1102.4.1.2. The sealing methods between dissimilar materials shall allow for differential expansion and contraction.

N1102.4.1.1 Installation. The components of the *building thermal envelope* as listed in Table N1102.4.1.1 shall be installed in accordance with the manufacturer's instructions and the criteria listed in Table N1102.4.1.1, as applicable to the method of construction. Where required by the *building official*, an *approved* third party shall inspect all components and verify compliance.

TABLE N1102.4.1.1
AIR BARRIER AND INSULATION INSTALLATION

COMPONENT	AIR BARRIER CRITERIA	INSULATION INSTALLATION CRITERIA
General requirements	A continuous air barrier shall be installed in the building envelope. The exterior thermal envelope contains a continuous air barrier. Breaks or joints in the air barrier shall be sealed.	Air-permeable insulation shall not be used as a sealing material.
Ceiling/attic	The air barrier in any dropped ceiling/soffit shall be aligned with the insulation and any gaps in the air barrier sealed. Access openings, drop down stairs or knee wall doors to unconditioned attic spaces shall be sealed.	The insulation in any dropped ceiling/soffit shall be aligned with the air barrier.
Walls	The junction of the foundation and sill plate shall be sealed. The junction of the top plate and the top of exterior walls shall be sealed. Knee walls shall be sealed.	Cavities within corners and headers of frame walls shall be insulated by completely filling the cavity with a material having a thermal resistance of R-3 per inch minimum. Exterior thermal envelope insulation for framed walls shall be installed in substantial contact and continuous alignment with the air barrier.
Windows, skylights and doors	The space between window/door jambs and framing, and skylights and framing shall be sealed.	
Rim joists	Rim joists shall include the air barrier.	Rim joists shall be insulated.
Floors (including above garage and cantilevered floors)	The air barrier shall be installed at any exposed edge of insulation.	Floor framing cavity insulation shall be installed to maintain permanent contact with the underside of subfloor decking, or floor framing cavity insulation shall be permitted to be in contact with the top side of sheathing, or continuous insulation installed on the underside of floor framing; and extends from the bottom to the top of all perimeter floor framing members.
Crawl space walls	Exposed earth in unvented crawl spaces shall be covered with a Class I vapor retarder with overlapping joints taped.	Where provided instead of floor insulation, insulation shall be permanently attached to the crawl space walls.
Shafts, penetrations	Duct shafts, utility penetrations, and flue shafts opening to exterior or unconditioned space shall be sealed.	
Narrow cavities		Batts in narrow cavities shall be cut to fit, or narrow cavities shall be filled by insulation that on installation readily conforms to the available cavity space.
Garage separation	Air sealing shall be provided between the garage and conditioned spaces.	
Recessed lighting	Recessed light fixtures installed in the building thermal envelope shall be sealed to the drywall.	Recessed light fixtures installed in the building thermal envelope shall be air tight and IC rated.
Plumbing and wiring		Batt insulation shall be cut neatly to fit around wiring

		and plumbing in exterior walls, or insulation that on installation readily conforms to available space shall extend behind piping and wiring.
Shower/tub on exterior wall	The air barrier installed at exterior walls adjacent to showers and tubs shall separate them from the showers and tubs.	Exterior walls adjacent to showers and tubs shall be insulated.
Electrical/phone box on exterior walls	The air barrier shall be installed behind electrical or communication boxes or air-sealed boxes shall be installed.	
HVAC register boots	HVAC register boots that penetrate building thermal envelope shall be sealed to the subfloor or drywall.	
Concealed sprinklers	When required to be sealed, concealed fire sprinklers shall only be sealed in a manner that is recommended by the manufacturer. Caulking or other adhesive sealants shall not be used to fill voids between fire sprinkler cover plates and walls or ceilings.	

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

N1102.4.1.2 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 ASTM E 779 or ASTM E 1827 and reported at a pressure of 0.2 inches w.g. (50 Pascals). Where required by the *code official*, testing shall be conducted by an a*pproved* third party. A written report of the results of the test shall be signed by the party conducting the test and provided to the *code official*. Testing shall be performed at any time after creation of all penetrations of the *building thermal envelope*.

During testing:

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

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

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

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

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

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

N1102.4.2 Fireplaces. New wood-burning fireplaces shall have tight-fitting flue dampers or doors, and outdoor combustion air. Where using tight-fitting doors on factory-built fireplaces listed and labeled in accordance with UL 127, the doors shall be tested and listed for the fireplace. Where using tight-fitting doors on masonry fireplaces, the doors shall be listed and labeled in accordance with UL 907. Open hearth fireplaces shall not be permitted indoors.

N1102.4.3 Fenestration air leakage. Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m^2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m^2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and *listed* and *labeled* by the manufacturer.

Exception: Site-built windows, skylights and doors.

N1102.4.4 Rooms containing fuel-burning appliances. In Climate Zones 3 through 8, where open combustion air ducts provide combustion air to open combustion fuel-burning appliances, the appliances and combustion air opening shall be located outside the building thermal envelope or enclosed in a room, isolated from inside the thermal envelope. Such rooms shall be sealed and insulated in accordance with the envelope requirements of Table N1102.1.2, where the walls, floors and ceilings shall meet a minimum of the basement wall *R*-value requirement. The door into the room shall be fully gasketed and any water lines and ducts in the room insulated in accordance with Section N1103. The combustion air duct shall be insulated where it passes through conditioned space to a minimum of R-8.

Exceptions:

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

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

N1102.4.5 Recessed lighting. Recessed luminaires installed in the *building thermal envelope* shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and *labeled* as having an air leakage rate not more than 2.0 cfm (0.944 L/s) when tested in accordance with ASTM E 283 at a 1.57 psf (75 Pa) pressure differential. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering.

N1102.5 Maximum fenestration *U*-factor and SHGC (Mandatory). The area-weighted average maximum fenestration *U*-factor permitted using tradeoffs from Section N1102.1.5 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 Section N1105 in Climate Zones 1through 3 shall be 0.50.

SECTION N1103
SYSTEMS

N1103.1 Controls (Mandatory). At least one thermostat shall be provided for each separate heating and cooling system.

N1103.1.1 Programmable thermostat. The thermostat controlling the primary heating or cooling system of the dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain *zone* temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed by the manufacturer with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C).

N1103.1.2 Heat pump supplementary heat (Mandatory). Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load.

N1103.2 Hot water boiler outdoor temperature setback. Hot water boilers that supply heat to the building through one- or two-pipe heating systems shall have an outdoor setback control that lowers the boiler water temperature based on the outdoor temperature.

N1103.3 Ducts. Ducts and air handlers shall be in accordance with Sections N1103.3.1 through N1103.3.5.

N1103.3.1 Insulation (Prescriptive). Supply and return ducts in attics shall be insulated to a minimum of R-8 where 3 inches (76.2 mm) in diameter and greater and R-6 where less than 3 inches (76.2 mm) in diameter. Supply and return ducts in other portions of the building shall be insulated to a minimum of R-6 where 3 inches (76.2 mm) in diameter or greater and R-4.2 where less than 3 inches (76.2 mm) in diameter.

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

N1103.3.2 Sealing (Mandatory). Ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with either the *International Mechanical Code* or Section M1601.4.1 of this code, as applicable.

Exceptions:

1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.

2. For ducts having a static pressure classification of less than 2 inches of water column (500 Pa), additional closure systems shall not be required for continuously welded joints and seams, and locking-type joints and seams of other than the snap-lock and button-lock types.

N1103.3.2.1 Sealed air handler. Air handlers shall have a manufacturer's designation for an air leakage of no more than 2 percent of the design air flow rate when tested in accordance with ASHRAE 193.

N1103.3.3 Duct testing (Mandatory). Ducts shall be pressure tested to determine air leakage by one of the following methods:

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

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

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

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

N1103.3.4 Duct leakage (Prescriptive). The total leakage of the ducts, where measured in accordance with Section R403.3.3, shall be as follows:

1. Rough-in test: The total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of conditioned floor area where the air handler is installed at the time of the test. Where the air handler is not installed at the time of the test, the total leakage shall be less than or equal to 3 cubic feet per minute (85 L/min) per 100 square feet (9.29 m^2) of conditioned floor area.

2. Post-construction test: Total leakage shall be less than or equal to 4 cubic feet per minute (113.3 L/min) per 100 square feet (9.29 m^2) of conditioned floor area.

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

N1103.4 Mechanical system piping insulation (Mandatory). Mechanical system piping capable of carrying fluids above 105°F (41°C) or below 55°F (13°C) shall be insulated to a minimum of R-3.

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

N1103.5 Service hot water systems. Energy conservation measures for service hot water systems shall be in accordance with Sections N1103.5.1 and N1103.5.4.

N1103.5.1 Heated water circulation and temperature maintenance systems (Mandatory). Heated water circulation systems shall be in accordance with Section R1103.5.1.1. Heat trace temperature maintenance systems shall be in accordance with Section R1103.5.1.2. Automatic controls, temperature sensors and pumps shall be accessible. Manual controls shall be readily *accessible*.

N1103.5.1.1 Circulation systems. Heated water circulation systems shall be provided with a circulation pump. The system return pipe shall be a dedicated return pipe or a cold water supply pipe. Gravity and thermo-syphon circulation systems shall be prohibited. Controls for circulating hot water system pumps shall start the pump based on the identification of a demand for hot water within the occupancy. The controls shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is no demand for hot water.

N1103.5.1.2 Heat trace systems. Electric heat trace systems shall comply with IEEE 515.1 or UL 515. Controls for such systems shall automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.

N1103.5.2 Demand recirculation systems. A water distribution system having one or more recirculation pumps that pump water from a heated water supply pipe back to the heated water source through a cold water supply pipe shall be a *demand recirculation water system*. Pumps shall have controls that comply with both of the following:

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

2. The control shall limit the temperature of the water entering the cold water piping to 104ºF (40ºC).

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

1. Piping 3/4 inch (19 mm) and larger in nominal diameter.

2. Piping serving more than one dwelling unit.

3. Piping located outside the conditioned space.

4. Piping from the water heater to a distribution manifold.

5. Piping located under a floor slab.

6. Buried piping.

7. Supply and return piping in recirculation systems other than demand recirculation systems.

N1103.5.4 Drain water heat recovery units. Drain water heat recovery units shall comply with CSA 55.2. Drain water heat recovery units shall be tested in accordance with CSA 55.1. Potable water-side pressure loss of drain water heat recovery units shall be less than 3 psi (20.7 kPa) for individual units connected to one or two showers. Potable water-side pressure loss of drain water heat recovery units shall be less than 2 psi (13.8 kPa) for individual units connected to three or more showers.

N1103.6 Mechanical ventilation (Mandatory). The building shall be provided with ventilation that meets the requirements of Section M1507 of this code or the *International Mechanical Code*, as applicable, or with other approved means of ventilation. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. System must be a balanced system that provides both outside air intake, and stale air exhaust. Permit documents must include a description or drawings of fresh air distribution strategy.

N1103.6.1 Whole-house mechanical ventilation system fan efficacy. Mechanical ventilation system fans shall meet the efficacy requirements of Table N1103.6.1.

Exception: Where mechanical ventilation fans are integral to tested and listed HVAC equipment, they shall be powered by an electronically commutated motor.

TABLE N1103.6.1 (R403.6.1)
MECHANICAL VENTILATION SYSTEM FAN EFFICACY

FAN LOCATION	AIR FLOW RATE MINIMUM (CFM)	MINIMUM EFFICACY (CFM/WATT)	AIR FLOW RATE MAXIMUM (CFM)
Range hoods	Any	2.8 cfm/watt	Any
In-line fan	Any	2.8 cfm/watt	Any

Bathroom, utility room	10	1.4 cfm/watt	< 90
Bathroom, utility room	90	2.8 cfm/watt	Any

For SI: 1 cubic foot per minute = 28.3 L/min.

N1103.7 Equipment sizing and efficiency rating (Mandatory). Heating and cooling equipment shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies. New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed.

N1103.8 Systems serving multiple dwelling units (Mandatory). Systems serving multiple dwelling units shall comply with Sections C403 and C404 of the IECC—Commercial Provisions in lieu of Section N1103.

N1103.9 Snow melt system controls (Mandatory). Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F (10°C), and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F (4.8°C).

N1103.9.1 Design (Mandatory). Energy use by snow and ice melt systems must be offset by on-site renewable energy generation equivalent to the energy used by the snow and ice melting equipment. Plans must be submitted that detail the type, size and location of the on-site renewable energy generation equipment. Note: A separate building permit is required for on-site renewable energy generation equipment.

N1103.9.2 Design criteria for supporting on-site renewable energy equipment (Mandatory). On-site renewable energy generation equipment installed to offset the energy used by snow and ice melt systems must be designed to provide 34,425 BTUs per square foot per year.

N1103.10 Pools ~~and permanent spa~~ energy consumption (Mandatory). ~~The energy consumption of pools and permanent spas shall be in accordance with Sections N1103.10.1 through N1103.10.5~~ Swimming pools must be provided with energy conservation measures in accordance with Section N1103.10.1 through N1103.10.6, or be unheated. Heated pools must be heated by solar thermal or other equipment that does not rely directly or indirectly on the burning of fossil fuels or they must have their energy use offset by on-site renewable energy generation equipment equivalent to the energy use by the swimming pool. ~~The energy use shall be determined as follows:~~

Exception: Swimming pools less than 200 sq. ft. in area are exempt from the requirements to provide renewable energy.

~~**N1103.10.1 Residential pools and permanent residential spas.** Swimming pools and permanent spas that are accessory to detached one- and two-family dwellings and townhouses three stories or less in height above grade plane and that are available only to the household and its guests shall be in accordance with APSP-145.~~[per errata]

N1103.10.~~2~~1 Heaters. The electric power to heaters shall be controlled by a readily *accessible* on-off switch that is an integral part of the heater mounted on the exterior of the heater, or external to and within 3 feet (914mm) of the heater. Operation of such switch shall not change the setting of the heater thermostat. Such switches shall be in addition to a circuit breaker for the power to the heater. Gas-fired heaters shall not be equipped with continuously burning ignition pilots.

N1103.10.~~3~~2 Time switches. Time switches or other control methods that can automatically turn off and on according to a preset schedule shall be installed for heaters and pump motors. Heaters and pump motors that have built-in time switches shall be in compliance with this section.

Exceptions:

1. Where public health standards require 24-hour pump operation.
2. Pumps that operate solar- and waste-heat-recovery pool heating systems.

N1103.10.43 (R403.10.43) Covers. Outdoor heated pools and outdoor permanent spas shall be provided with a vapor retardant cover or other *approved* vapor-retardant means. Pools heated to more than 90 degrees F shall have a pool cover with a minimum insulation value of R-12.

~~**Exception:** Where more than 70 percent of the energy for heating, computed over an operation season, is from site-recovered energy, such as from a heat pump or solar energy source, covers or other vapor-retardant means shall not be required.~~

N1103.10.4 (R403.10.4) Filters. Swimming pool filters must be cartridge-type filters.

N1103.10.5 (R403.10.4) Pumps. Swimming pool pumps must be multi-speed pumps.

N1103.10.6 Energy conservation design standards for swimming pools. For the purpose of calculating the energy use of swimming pools, the following are assumed. Note: This Section is not intended to limit the season or temperature of swimming pools.
Swimming Pool Season: Outdoor Pools 3 months, Indoor Pools 12 months
Pool Heating Temperature: 82 degrees Fahrenheit or less.
On-Site Renewable Energy Requirements: 29,000 BTUs per square foot of pool surface area per year.

N1103.11 (R403.11) Portable spas (Mandatory). The energy consumption of electric-powered portable spas shall be controlled by the requirements of ~~APSP-14~~ APSP-15 [per errata].

N1103.12 (R403.12) Residential pools and permanent residential spas. Residential swimming pools and permanent residential spas that are accessory to detached one- and two-family dwellings and townhouses 3 stories or less in height above grade plane and that are available only to the household and its guests shall be in accordance with APSP-15.

N1103.13 (R403.13) Spas (Mandatory). Any energy use by indoor or outdoor spas must be offset by on-site renewable energy generation equivalent to the energy use by the spa. Plans must show the annual energy use of the spa, the calculation method used to determine the expected energy use, and the on-site renewable energy system(s) which will be used to offset the energy used by the spa. All spas must be equipped with an insulated cover that is listed to provide a minimum R-value of at least 12.

Exception: ~~New~~ Spas and hot tubs which have been tested and listed for compliance with the requirements of the California Energy Commission (CEC) Title 20 (Standby power for portable electric spas shall not be greater than 5[V2/3] watts where V=the total volume of the spa in gallons), and are less than 64 square feet in surface area shall be exempted from the requirement to offset their energy usage by on-site renewable energy generation. Spas larger than 64 sq. ft. in surface are that are certified to meet the requirements of the CEC shall offset their requirements at the rate of 140,000 BTUs per square foot per year.

N1103.13.1 (R403.13.1) Design criteria for spas. The requirements of this Section apply to spas that do not meet the exception in Section N1103.13.
Spa Season: Season 12 months
On-Site Renewable Energy Requirements: 430,000 BTUs per square foot per year.

N1103.14 (R403.14) Other exterior energy uses. Exterior energy uses, with the exception of cooking appliances, must be offset with on-site renewable energy production. For purposes of calculating renewable energy offset requirements, the minimum usage of exterior, fossil fuel consuming, fireplaces and firepits shall be considered to be 50 hours per year, and exterior space heating devices shall be assumed to operate a minimum of 150 hours per year.

N1103.15 (R403.15) Minimum Equipment Efficiency. Homes using the prescriptive path must comply with the minimum equipment efficiency values of N1103.15.1 (R403.15)

Exceptions:

1. Permits for the replacement of existing units where venting upgrade is not readily achievable.

2. Additions and remodels where these systems are not being modified.

N1103.15.1 (R403.15.1) Minimum Equipment Efficiency Values.

Appliances (New or Replaced):	Energy Star Certified
Furnaces, Boilers:	92% AFUE with ECM Motors

Water Heaters:	82 Energy Factor
Heat Pumps:	Energy Star Certified
Unit Heaters	92% Thermal Efficiency

SECTION N1104 (R404)
ELECTRICAL POWER AND LIGHTING SYSTEMS
(MANDATORY)

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

Exception: Low-voltage lighting.

N1104.1.1 (R404.1.1) Lighting equipment (Mandatory). Fuel gas lighting systems shall not have continuously burning pilot lights.

SECTION N1105 (R405)
SIMULATED PERFORMANCE ALTERNATIVE
(PERFORMANCE)

Section N1105 is deleted.

SECTION N1106 (R406)
ENERGY RATING INDEX
COMPLIANCE ALTERNATIVE

N1106.1 (R406.1) Scope. This section establishes criteria for compliance using an Energy Rating Index (ERI) analysis.

N1106.2 (R406.2) Mandatory requirements. Compliance with this section requires that the mandatory provisions identified in Sections N1101~~.2~~.13 through N1104 identified as "mandatory" and Section [changed per errata] ~~and~~ N1103.5.3 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.~~2~~1[changed per errata] or 402.1~~.4.~~3 [changed per errata] of the 2009 *International Energy Conservation Code*.

Exception: Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

N1106.3 (R406.3) Energy rating index. The Energy Rating Index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a *residential building* that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a 1 percent change in the total energy use of the rated design relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the *residential building*.

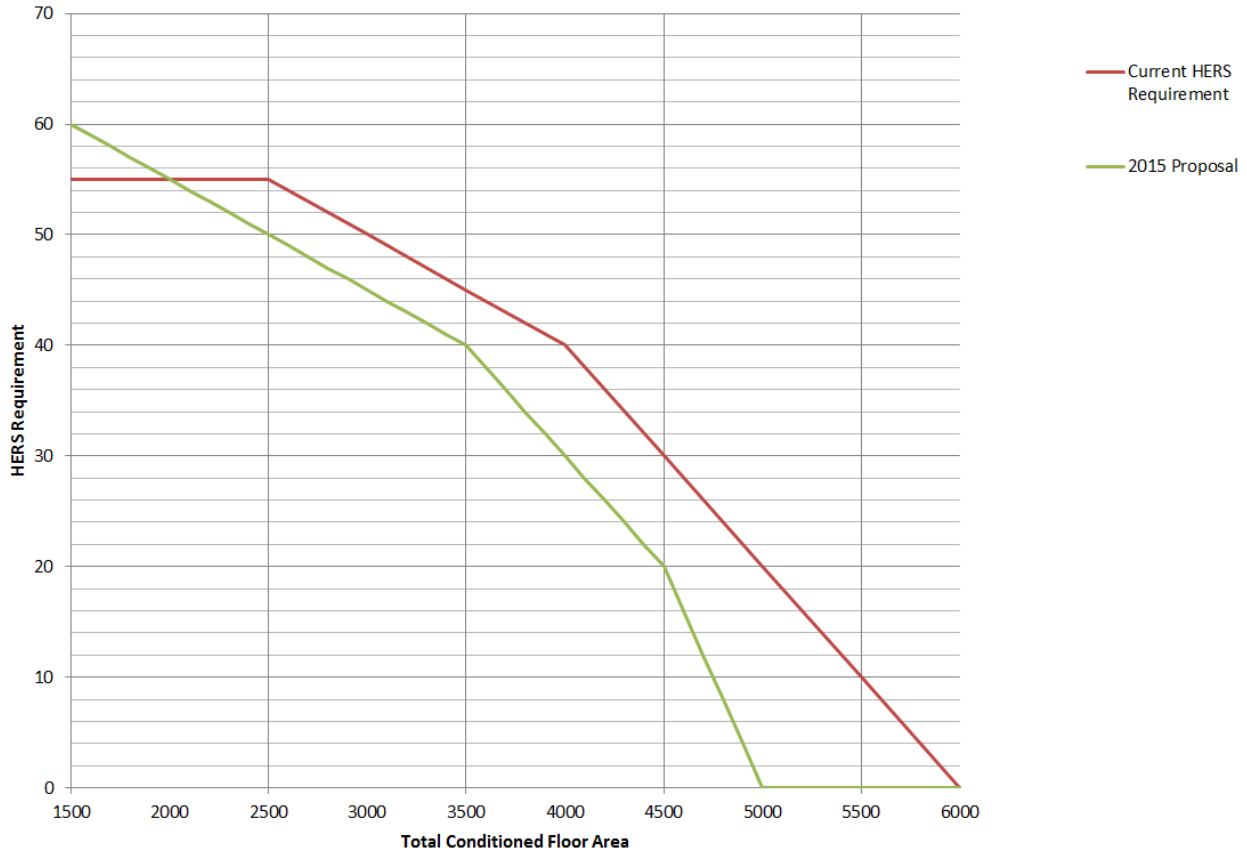
N1106.3.1 (R406.3.1) ERI reference design. The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements. The proposed *residential building* shall be shown to have an annual total normalized modified load less than or equal to the annual total loads of the *ERI reference design*.

N1106.4 (R406.4) ERI-based compliance. Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value listed in Table N1106.4 when compared to the *ERI reference design*.

Table N1106.4 is amended to show required HERS ratings based on the amount of the conditioned floor area ("CFA").

Proposed footnote: "For thick wall assemblies such as double-stud and strawbale walls, for the purpose of determining HERS requirements (Table 1), conditioned floor area calculations shall be measured from the interior air barrier as depicted in the construction documents." {commentary: The intention is to encourage low embodied energy construction materials such as cellulose and straw by avoiding penalizing of their relatively low r-values per inch.}

TABLE N1106.4
MAXIMUM ENERGY RATING INDEX



SqFt	Maximum ERI*
1500	60
1600	59
1700	58
1800	57
1900	56
2000	55
2100	54
2200	53
2300	52
2400	51
2500	50
2600	49

SqFt	Maximum ERI*
2700	48
2800	47
2900	46
3000	45
3100	44
3200	43
3300	42
3400	41
3500	40
3600	38
3700	36
3800	34

SqFt	Maximum ERI*
3900	32
4000	30
4100	28
4200	26
4300	24
4400	22
4500	20
4600	16
4700	12
4800	8
4900	4
5000	0

*Conditioned Floor Area to be rounded to the nearest 100 sqft

N1106.5 (R406.5) Verification by approved agency. Verification of compliance with Section N1106 shall be completed by an *approved* third party.

N1106.6 (R406.6) Documentation. Documentation of the software used to determine the ERI and the parameters for the residential building shall be in accordance with Sections N1106.6.1 through N1106.6.3.

N1106.6.1 (R406.6.1) Compliance software tools. Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the *code official*.

N1106.6.2 (R406.6.2) Compliance report. Compliance software tools shall generate a report that documents that the ERI of the *rated design* complies with Sections N1106.3 and N1106.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building.

2. An inspection checklist documenting the building component characteristics of the *rated design*. The inspection checklist shall show results for both the *ERI reference design* and the *rated design*, and shall document all inputs entered by the user necessary to reproduce the results.

3. Name of individual completing the compliance report.

4. Name and version of the compliance software tool.

Exception: Multiple orientations. Where an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four (north, east, south and west) cardinal orientations.

N1106.6.3 (R406.6.3) Additional documentation. The *code official* shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the *ERI reference design*.

2. A certification signed by the builder providing the building component characteristics of the *rated design.*

3. Documentation of the actual values used in the software calculations for the *rated design*.

4. <u>A digital copy of the energy model file (for example, if using RemRate to create a HERS score, the .blg file).</u>

N1106.7 (R406.7) Calculation software tools. Calculation software, where used, shall be in accordance with Sections N1106.7.1 through N1106.7.3.

N1106.7.1 R(406.7.1) Minimum capabilities. Calculation procedures used to comply with this section shall be software tools capable of calculating the ERI as described in Section N1106.3, and shall include the following capabilities:

1. Computer generation of the *ERI reference design* using only the input for the *rated design*. The calculation procedure shall not allow the user to directly modify the building component characteristics of the *ERI reference design*.

2. Calculation of whole-building, as a single *zone*, sizing for the heating and cooling equipment in the *ERI reference design* residence in accordance with Section N1103.7.

3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.

4. Printed *code official* inspection checklist listing each of the *rated design* component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.

N1106.7.2 (406.7.2) Specific approval. Performance analysis tools meeting the applicable sections of Section N1106 shall be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall approve tools for a specified application or limited scope.

N1106.7.3 (R406.7.3) Input values. When calculations require input values not specified by Sections N1102, N1103, N1104 and N1105, those input values shall be taken from an approved source.

SECTION N1107 (R501)
EXISTING BUILDINGS—GENERAL

N1107.1 (R501.1) Scope. The provisions of Sections N1107 through N1111 shall control the *alteration*, repair, addition and change of occupancy of existing buildings and structures.

N1107.1.1 (R501.1.1) Additions, alterations, or repairs: General. Additions, alterations, or repairs to an existing building, building system or portion thereof shall comply with Section N1108, N1109 or N1110. Unaltered portions of the existing building or building supply system shall not be required to comply with this chapter except as specified by Figure N1101.13.2 (R401.2.2) "Options for Additions" or Figure N1101.13.3 (R401.2.3) "Options for Alterations, Remodels, and Repairs"

N1107.2 (R501.2) Existing buildings. Except as specified in this chapter, this code shall not be used to require the removal, *alteration* or abandonment of, nor prevent the continued use and maintenance of, an existing building or building system lawfully in existence at the time of adoption of this code.

N1107.3 (R501.3) Maintenance. Buildings and structures, and parts thereof, shall be maintained in a safe and sanitary condition. Devices and systems that are required by this code shall be maintained in conformance with the code edition under which installed. The owner or the owner's authorized agent shall be responsible for the maintenance of buildings and structures. The requirements of this chapter shall not provide the basis for removal or abrogation of energy conservation, fire protection and safety systems and devices in existing structures.

N1107.4 (R501.4) Compliance. *Alterations*, *repairs*, *additions* and changes of occupancy to, or relocation of, existing buildings and structures shall comply with the provisions for *alterations*, *repairs*, *additions* and changes of occupancy or relocation, respectively, in this code and the *International Building Code*, *International Fire Code*, *International Fuel Gas Code*, *International Mechanical Code*, *International Plumbing Code*, *International Property Maintenance Code*, *International Private Sewage Disposal Code* and NFPA 70.

N1107.5 (R501.5) New and replacement materials. Except as otherwise required or permitted by this code, materials permitted by the applicable code for new construction shall be used. Like materials shall be permitted for repairs, provided no hazard to life, health or property is created. Hazardous materials shall not be used where the code for new construction would not permit their use in buildings of similar occupancy, purpose and location.

N1107.6 Historic buildings. No provision of this chapter relating to the construction, *repair*, *alteration*, restoration and movement of structures, and *change of occupancy* shall be mandatory for *historic buildings* provided a report has been submitted to the code official and signed by the owner, a registered *design professional*, or a representative of the State Historic Preservation Office or the historic preservation authority having jurisdiction, demonstrating that compliance with that provision would threaten, degrade or destroy the historic form, fabric or function of the *building*.

SECTION N1108
ADDITIONS

N1108.1 General. Additions to an existing building, building system or portion thereof shall conform to the provisions of this chapter as they relate to new construction without requiring the unaltered portion of the existing building or building system to comply with this chapter except as specified by Figure N1101.13.2 (R401.2.2) "Options for Additions" or Figure N1101.13.3 (R401.2.3) "Options for Alterations, Remodels, and Repairs." Additions shall not create an unsafe or hazardous condition or overload existing building systems. ~~An addition shall be deemed to comply with this chapter where the addition alone complies, where the existing building and addition comply with this chapter as a single building, or where the building with the addition uses no more energy than the existing building.~~ Additions shall be in accordance with Section N1108.1.1 or N1108.1.2.

N1108.1.1 (R502.1.1) Prescriptive compliance. Additions shall comply with Sections N1108.1.1.1 through N1108.1.1.4.

N1108.1.1.1 Building envelope. New building envelope assemblies that are part of the addition shall comply with Sections N1102.1, N1102.2, N1102.3.1 through N1102.3.5, and N1102.4.

~~**Exception:** Where nonconditioned space is changed to conditioned space, the building envelope of the addition shall comply where the UA, as determined in Section N1102.1.4,[There is an errata here, but the inserted reference is also crossed out. I believe that the intent is to reference a more general "Section N1102 (R402)".] of the existing building and the addition, and any alterations that are part of the project, is less than or equal to UA generated for the existing building.~~

N1108.1.1.2 Heating and cooling systems. New heating, cooling and duct systems that are part of the addition shall comply with Sections N1103.1, N1103.2, N1103.3, N1103.5 and N1103.6.

Exception: Where ducts from an existing heating and cooling system are extended to an addition, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section ~~N1103.2.2.~~ N1103.3.3

N1108.1.1.3 Service hot water systems. New service hot water systems that are part of the addition shall comply with Section N1103.4.

N1108.1.1.4 Lighting. New lighting systems that are part of the addition shall comply with Section N1104.1.

~~**N1108.1.2 (R502.1.2) Existing plus addition compliance (Simulated Performance Alternative).** Where nonconditioned space is changed to conditioned space, the addition shall comply where the annual energy cost or energy use of the addition and the existing building, and any alterations that are part of the project, is less than or equal to the annual energy cost of the existing building when modeled in accordance with Section N1105. The addition and any alterations that are part of the project shall comply with Section N1105 in its entirety.~~

SECTION N1109
ALTERATIONS

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

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

N1109.1.1 (R503.1.1) Building envelope. Building envelope assemblies that are part of the alteration shall comply with Section N1102.1.2 or N1102.1.4, Sections N1102.2.1 through N1102.2.~~12~~13[per errata], N1102.3.1, N1102.3.2, N1102.4.3 and ~~N1102.4.4~~ N1102.4.5 [per errata].

Exception: The following alterations need not comply with the requirements for new construction provided the energy use of the building is not increased:

1. Storm windows installed over existing fenestration.
2. Existing ceiling, wall or floor cavities exposed during construction provided that these cavities are filled with insulation.
3. Construction where the existing roof, wall or floor cavity is not exposed.
4. Roof recover.
5. Roofs without insulation in the cavity and where the sheathing or insulation is exposed during reroofing shall be insulated either above or below the sheathing.

6. Surface applied window film installed on existing single pane fenestration assemblies to reduce solar heat gain provided the code does not require the glazing or fenestration assembly to be replaced.

N1109.1.1.1 Replacement fenestration. Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for *U*-factor and SHGC as provided in Table N1102.1.4.

N1109.1.2 Heating and cooling systems. New heating, cooling and duct systems that are part of the alteration shall comply with Sections N1103.1, N1103.2, N1103.3 and N1103.6.

> **Exception:** Where ducts from an existing heating and cooling system are extended, duct systems with less than 40 linear feet (12.19 m) in unconditioned spaces shall not be required to be tested in accordance with Section N1103.3.3.

N1109.1.3 Service hot water systems. New service hot water systems that are part of the alteration shall comply with Section N1103.5.

N1109.1.4 Lighting. New lighting systems that are part of the alteration shall comply with Section N1104.1.

> **Exception:** Alterations that replace less than 50 percent of the luminaires in a space, provided that such alterations do not increase the installed interior lighting power.

N1109.2 (R503.2) Change in space conditioning. Any non-conditioned or low energy space that is altered to become *conditioned space* shall be required to be brought into full compliance with this chapter.

> ~~**Exception:** Where the simulated performance option in Section N1105 is used to comply with this section, the annual energy cost of the proposed design is permitted to be 110 percent of the annual energy cost otherwise allowed by Section N1105.3.~~

SECTION N1110
REPAIRS

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

N1110.2 (R504.2) Application. For the purposes of this code, the following shall be considered repairs:

1. Glass-only replacements in an existing sash and frame.

2. Roof repairs.

3. Repairs where only the bulb and/or ballast within the existing luminaires in a space are replaced provided that the replacement does not increase the installed interior lighting power.

SECTION N1111
CHANGE OF OCCUPANCY OR USE

N1111.1 (R505.1) General. Spaces undergoing a change in occupancy that would result in an increase in demand for either fossil fuel or electrical energy shall comply with this code.

N1111.2 (R505.2) General. Any space that is converted to a dwelling unit or portion thereof from another use or occupancy shall comply with this code.

~~**Exception:** Where the simulated performance option in Section N1105 is used to comply with this section, the annual energy cost of the proposed design is permitted to be 110 percent of the annual energy cost otherwise allowed by Section N1105.3.~~

SECTION N1112
MODIFICATIONS

Retain the existing amendment section for allowing modifications to BuildSmart requirements to be approved by the building official by adding a new Section N1112 to the published IRC.

N1112 Modifications. The Chief Building Official may make modifications to the requirements of this Chapter as allowed in Section 104.10 of the Boulder County Building Code if it is determined that strict application of the requirements of this Chapter:

1. Creates practical difficulties or excessive expense in the upgrade of an existing residential structure.

2. Requires alteration to either a structure greater than 50 years in age or any structure in a historic district or site which would materially alter the historic integrity of that structure or adversely affect the historic integrity of the district or site.

3. Creates practical difficulties in meeting on-site renewable energy requirements due to topographic constraints associated with the lot or location of the structure.

In assessing whether a request for a modification should be granted, the Chief Building Official shall, in consultation with the staff and/or an Energy Rater retained by the Building Official at the applicant's expense, determine whether the strict application of this Chapter creates a situation described in items 1 through 3 listed above. If it is determined that the request warrants a modification on this basis, the Chief Building Official shall determine what appropriate mitigation measures shall be required to ensure that the structure meets the intent and spirit of this Chapter. Appropriate mitigation measures may include requiring additional energy-saving or resource-efficient construction methods or materials, sustainable framing techniques, use of environmentally friendly materials, adoption of water-saving landscaping and irrigation, or similar conservation measures.

~~IRC CHAPTER 12~~
~~ELEVATORS AND CONVEYING SYSTEMS~~

Note: Since Chapter 12 is no longer being deleted, it is occupied by "MECHANICAL ADMINISTRATION." There is already a Section R321 in the IRC, "ELEVATORS AND PLATFORM LIFTS." The published Section R321 also refers to the appropriate (and current) ASME standards. The existing subsection R1201.4 below is moved to Section R321.

~~IRC SECTION R1201~~
~~GENERAL~~

~~**R1201.1 Scope.** This chapter shall govern the installation and inspection of conveyances including elevators, chair lifts, and dumbwaiters in one- and two-family dwellings~~

~~**R1201.2 Referenced standards.** Except as otherwise provided for in this code the design, construction, installation, alteration, repair, and maintenance of elevators and conveying systems and their components shall conform to ASME A17.1/CSA B44-2007 and ASME A18.1-2005.~~

~~**R1201.3 Design.** The conveyance shall be designed by an experienced person who has achieved ASME QE-1 certification and who in the opinion of the Building Official has expert knowledge of ASME A-17.1 part 5.3 and A18.1 parts 5, 6, & 7. Structural members within the building which support the weight of the conveyance must be designed by a Colorado-licensed engineer.~~

~~**R1201.4**~~ **R321.4 Permits and inspections.** Each residential conveyance must be applied for on a separate building permit. Inspections shall be performed by an inspector who has obtained ASME QEI-1 certification. The inspection report(s) must be sent to the Building Safety & Inspection Services Division office for approval at the completion of the work and prior to the use of the conveyance.

CHAPTER 13
GENERAL MECHANICAL SYSTEM REQUIREMENTS

SECTION M1302
APPROVAL

Add a new subsection to refer to state and federal lists of approved wood-burning appliances.

M1302.2 Solid Fuel Burning Equipment. No permit shall be issued for the installation of a solid-fuel-burning fireplace stove, fireplace insert or wood stove appliance unless the appliance fully conforms with the requirements for emissions testing, certification and labeling found under Title 30, Article 28, Sections 402-405 of the Colorado Revised Statutes. All such appliances to be installed must be certified by the Air Pollution Control Division of the Colorado Department of Health to meet the emissions standards set forth in Section IV of Regulation No. 4 of Volume I of the Colorado Air Quality Control Commission as EPA Phase II or Colorado Phase III solid-fuel-burning devices.

Please refer to the list of Colorado-certified residential burning devices, including a link to EPA-approved wood-burning appliances, at:

https://www.colorado.gov/pacific/cdphe/approved-indoor-burning-devices

~~and the EPA-certified residential burning devices at:~~

~~http://www.epa.gov/Compliance/resources/publications/monitoring/caa/woodstoves/certifiedwood.pdf~~

CHAPTER 24
FUEL GAS

SECTION G2417
INSPECTION, TESTING AND PURGING

DELETE this existing amendment. The published code test pressure is 1 ½ times the working pressure or 3 psi for a duration of 10 minutes. If contractors are used to testing at a higher pressure for a longer duration, that's fine, but why not go with the nationally recognized standard?

~~*Amend Section G2417.4.1 to read as follows:*~~

~~**G2417.1 Test pressure.** The test pressure to be used shall be not less than one and one-half times the proposed maximum working pressure, but not less than 10 psig (67 kPa gauge)…~~

~~**G2417.4.2 Test duration.** The test duration shall be not less than 15 minutes.~~

~~Note that these gas piping test requirements are not being changed from previous amendments, but are being placed in more appropriate locations in the IRC and the IFGC, and that these requirements match those of the cities of Boulder and Longmont.~~

SECTION G2434
VENTED GAS FIREPLACES (DECORATIVE APPLIANCES)

DELETE this existing amendment. The current provisions of IRC G2434, G2432 and G2406, etc., cover these areas. These amendments were written at a time when there were many more prescriptive requirements in the codes. Today, the published code language, the listing of the appliance and the manufacturer's installation and use instructions, which are an integral part of the listing, cover all of these areas.

~~**G2434.3 Vented Gas Fireplaces.**~~

> ~~**G2434.3.1 Gas Log Fireplaces.** In addition to the general requirements specified in Section R2434, gas logs installed in fireplaces shall comply with the requirements specified for heating equipment and heating appliances in this code. Approved gas-fired decorative log sets may be installed only in solid-fuel-burning fireplaces, provided:~~

~~1. The gas log is a listed appliance and is installed only in accordance with the manufacturer's instructions.~~

~~2. If the fireplace is equipped with a damper, it shall either be permanently blocked open, removed completely, or an opening or openings shall be cut in the damper to provide the minimum amount of opening prescribed in the manufacturer's instructions.~~

~~**Exception:** Damper clamps that are an integral part of a listed gas log assembly and are installed in accordance with the manufacturer's instructions are permitted.~~

~~3. The fireplace chimney shall comply with Sections 2101.3.1 and 2111 of the Building Code. The cross-sectional area of the flue passageway shall be in accordance with Figure 2113.16 for masonry chimneys and Section 805 for factory-built chimneys.~~

~~4. Gas logs shall be equipped with a pilot and listed safety shutoff valve.~~

~~5. Gas logs may be installed in factory-built fireplaces only if the factory-built fireplace is listed for the installation of a gas log and provided with a means for installation of the gas piping.~~

6. ~~Permanent combustion air opening(s), communicating directly with outside air, shall be provided in the firebox or in an area directly communicating with the room in which the fireplace is located when additional combustion air is required by Chapter 7 or if the gas log is installed in a bedroom.~~

IRC CHAPTER 26
PLUMBING

IRC SECTION P2601
GENERAL

P2601.4 Sanitation Facilities for Workers. Toilet facilities shall be provided for construction workers and such facilities shall be maintained in a sanitary condition. Construction workers toilet facilities of the non-sewer type shall conform to ANSI Z4.3-2005.

IRC CHAPTER 28
WATER HEATERS

IRC SECTION P2801
GENERAL

~~**P2801.2.1**~~ **P2801.3.1 Heat Traps.** Water heating equipment not supplied with integral heat traps that serve noncirculation systems shall be provided with heat traps on the supply and discharge piping consisting of an arrangement of piping and fittings that prevents thermo-siphoning of hot water during standby periods.

IRC CHAPTER 29
WATER SUPPLY AND DISTRIBUTION

SECTION P2911
GRAY WATER:
ON-SITE NONPOTABLE WATER REUSE SYSTEMS

The gray water provisions were previously located in Section P3009 of the 2012 IRC. They have been moved to Section P2911 in the 2015 IRC. Although there has been recent legislation and the development of new regulations on the reuse of gray water, there are still substantial barriers to its use under Colorado water law and water quality regulations. For example, the legality of the use of gray water for anything other than the indoor flushing of toilets is in question unless there is a specifically permitted well or adjudicated water right associated with the use. Add a sentence to Section P2911.1 to reference the requirements for compliance with Colorado statutes and regulations.

P2911.1 General. The provisions of this section shall govern the construction, installation, alteration and repair of on-site nonpotable water reuse systems for the collection, storage, treatment and distribution of on-site sources of nonpotable water as permitted by the jurisdiction. Any use of *gray water* shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

SECTION P2912
RAINWATER:
NONPOTABLE RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS

The rainwater provisions are newly located in Section P2912 of the 2015 IRC. Although there has been recent legislation on the collection of rainwater, there are still substantial barriers to its use under Colorado water law and there are also water quality concerns. Add a sentence to Section P2912.1 to reference the requirements for compliance with Colorado statutes and regulations.

P2912.1 General. The provisions of this section shall govern the construction, installation, alteration, and repair of rainwater collection and conveyance systems for the collection, storage, treatment and distribution of rainwater for nonpotable applications, as permitted by the jurisdiction. Any use of rainwater shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Health and Environment, Water Quality Control Commission.

IRC CHAPTER 30
SANITARY DRAINAGE

SECTION P3009
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

These are new provisions for subsurface landscape irrigation systems supplied by nonpotable water from on-site water reuse systems. As with the previous two sections, there are still substantial barriers to the use of these systems under Colorado water law. Add a sentence to Section P3009.1 to reference the requirements for compliance with Colorado statutes and regulations.

P3009.1 Scope. The provisions of this section shall govern the materials, design, construction and installation of subsurface landscape irrigation systems connected to nonpotable water from on-site water reuse systems. Any use of *gray water* or rainwater shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission.

IRC APPENDIX E
MANUFACTURED HOUSING USED AS DWELLINGS

Add the adoption of Appendix E, Manufactured Housing Used as Dwellings, with amendments to correlate with the requirements of the Colorado Department of Local Affairs, Division of Housing.

SECTION AE101
SCOPE

Amend Section AE101.1 to include manufactured housing on rental lots.

AE101.1 General. These provisions shall be applicable only to a *manufactured home* used as a single *dwelling unit* ~~installed on privately owned (nonrental) lots~~ and shall apply to the following: *(remainder of section to remain as published)*

Add a Section AE101.2 to require that all installations meet the requirements of the Colorado Department of Local Affairs, Division of Housing.

AE101.2 Colorado installation requirements. All *manufactured home* installations are to be in accordance with the requirements of the Colorado Department of Local Affairs, Division of Housing, including the most current edition of the "Manufactured Homes and Factory Built Housing Installation Handbook," which is available at the following link:

https://www.colorado.gov/pacific/dola/manufactured-housing-installation-program

IRC APPENDIX F
PASSIVE RADON GAS CONTROLS

Retain the existing adoption of Appendix F as published.

~~IRC APPENDIX G~~
~~SWIMMING POOLS, SPAS, AND HOT TUBS~~

Appendix G of the IRC no longer exists. It is replaced by the adoption of the International Swimming Pool and Spa Code ("ISPSC"). The published codealso includes requirements for using mesh fencing as pool barriers, which eliminates the need for an existing amendment.

~~*Add a new item 11 under Section AG105.2, to read as follows:*~~
~~**AG105.2 Outdoor swimming pool.**~~

~~**11.** Pool barriers constructed of wood framing and wire mesh must meet the following requirements:~~

~~**a.** Wood columns in contact with earth or set in concreted that is in direct contact with earth must be preservative-treated wood in accordance with AWPA U1.~~

~~**b.** Columns and rails must be mechanically fastened together.~~

~~**c.** Wire mesh must be a minimum 14 gage.~~

~~**d.** Wire mesh must be fastened to the columns and rails using minimum 1" galvanized staples placed a maximum of 6 inches on center.~~

APPENDIX R
LIGHT STRAW-CLAY CONSTRUCTION

Adopt the new Appendix R for light straw-clay construction.

APPENDIX S
STRAWBALE CONSTRUCTION

Adopt the new Appendix S for strawbale construction.

SECTION AS108
THERMAL INSULATION

Add a new Section AS108.2 to specify a straw bale wall assembly that is deemed to meet the prescriptive requirements of BuildSmart Table N1102.1.2.

AS108.2 Prescriptive Assembly. Wall assemblies that conform to the requirements of this section shall be deemed to meet the building thermal envelope requirements of Section N1102.1.2 (R402.1.2).

AS108.2.1 Wall assembly. The strawbale wall assembly shall consist of stacked straw bales rendered on the interior and exterior sides with plaster. The bales shall be 2-string wheat, rye, barley, oat, or rice straw having thicknesses of 14" +/- 1" parallel to the strings, and 18" +/- 1" perpendicular to the strings. Bales shall have a minimum dry density of 6.5 pounds per cubic foot. Bales may be stacked in either thickness orientation (referred to as "on-edge" or "laid flat"). Cavities created by

structural and/or non-structural framing members located within the strawbale wall thickness shall be filled with straw flakes, light straw-clay, or other equivalent, approved, vapor-open insulation materials.

AS108.2.2 Plaster. The plaster shall be a clay, lime, or approved lime-cement material with a thickness as specified in this chapter on both the interior and exterior. Interior and exterior plaster must be continuous over the entire strawbale wall surface.

Exceptions:

1. Utility penetrations.
2. *Truth windows*.
3. Interior wall intersections.

AS 108.2.3 Interior plaster. Interior plaster on exterior strawbale walls is to have a vapor permeability equivalent to that of a Class III vapor retarder, as required in Chapter 11 of the IRC for Climate Zone 5. Class II and Class I vapor retarders are not to be included in exterior strawbale wall assemblies.

Exception: Enclosure of a shower or steam room adjacent to an exterior strawbale wall.

Amendments to the Boulder County Building Code

Amendments to the 2012 International Mechanical Code

2015 International Mechanical Code, published by the International Code Council (ICC), with amendments to the following:

IMC CHAPTER 1
ADMINISTRATION

~~*This chapter is deleted in its entirety.*~~ *Amend the Chapter 1 administrative provisions to correlate with other administrative amendments to the IBC, IRC, IEBC, etc., such as Right of Entry, Liability, Board of Review, etc.*

IMC CHAPTER 9
SPECIFIC APPLIANCES, FIREPLACES, AND SOLID FUEL-BURNING EQUIPMENT

IMC SECTION 901
GENERAL

Update the existing amendment to include the current link to state and federal lists of approved wood-burning appliances.

~~**901.5**~~ **901.4 Solid Fuel Burning Equipment.** No permit shall be issued for the installation of a solid-fuel-burning fireplace stove, fireplace insert or wood stove appliance unless the appliance fully conforms with the requirements for emissions testing, certification and labeling found under Title 30, Article 28, Sections 402-405 of the Colorado Revised Statutes. All such appliances to be installed must be certified by the Air Pollution Control Division of the Colorado Department of Public Health to meet the emissions standards set forth in Section IV of Regulation No. 4 of Volume I of the Colorado Air Quality Control Commission as EPA Phase II or Colorado Phase III solid-fuel-burning devices.

Please refer to the list of Colorado-certified residential burning devices, including a link to EPA-approved wood-burning appliances, at:

https://www.colorado.gov/pacific/cdphe/approved-indoor-burning-devices

~~and the EPA-certified residential burning devices at:~~

~~http://www.epa.gov/Compliance/resources/publications/monitoring/caa/woodstoves/certifiedwood.pdf~~

Amendments to the Boulder County Building Code

Amendments to the 2015 International Plumbing Code

2015 International Plumbing Code, including specifically Appendix E and published by the International Code Council (ICC).

IPC CHAPTER 1
ADMINISTRATION

This chapter is deleted in its entirety and replaced by Chapter 1 of the Boulder County Building Code, the administrative provisions.

IPC Chapter 5
Water Heaters

IPC SECTION 502
INSTALLATION

Change the numbering of the existing additional subsection to match the numbering in the IPC.

~~**502.1.1**~~ **502.1.2** **Heat Traps.** Water heating equipment not supplied with integral heat traps that serve noncirculation systems shall be provided with heat traps on the supply and discharge piping consisting of an arrangement of piping and fittings that prevents thermo-siphoning of hot water during standby periods.

IPC CHAPTER 11
STORM DRAINAGE

IPC SECTION 1106
SIZE OF CONDUCTORS, LEADERS, AND STORM DRAINS

Retain the existing amended Section 1106.1, which reads as follows:

1106.1 General. The size of the vertical conductors and leaders, building storm drains, building storm sewers, and any horizontal branches of such drains or sewers shall be based on the 100-year hourly rainfall rate of 2.4 inches per hour.

The provisions for the use of gray water and rainwater have been moved from the former Appendix C of the IPC to new chapters 13 and 14. As with these provisions in the IRC, wording has been added to make it clear that any reuse of nonpotable water must be in compliance with the requirements of the Colorado Division of Water Resources and the Colorado Department of Public Health and Environment.

CHAPTER 13
NONPOTABLE WATER SYSTEMS

SECTION 1301

GENERAL

1301.1 Scope. The provisions of Chapter 13 shall govern the materials, design, construction and installation of systems for the collection, storage, treatment and distribution of nonpotable water. The use and application of nonpotable water shall comply with laws, rules and ordinances applicable in the jurisdiction. Any use of *nonpotable water* shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

SECTION 1302
ON-SITE NONPOTABLE WATER REUSE SYSTEMS

1302.1 General. The provisions of Section 1302 shall govern the construction, installation, alteration and repair of on-site nonpotable water reuse systems for the collection, storage, treatment and distribution of on-site sources of nonpotable water as permitted by the jurisdiction. Any use of *gray water* or *nonpotable water* shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

SECTION 1303
NONPOTABLE RAINWATER COLLECTION AND DISTRIBUTION SYSTEMS

1303.1 General. The provisions of Section 1303 shall govern the construction, installation, alteration and repair of rainwater collection and conveyance systems for the collection, storage, treatment and distribution of rainwater for nonpotable applications, as permitted by the jurisdiction. Any use of *rainwater* shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

SECTION 1304
RECLAIMED WATER SYSTEMS

1304.1 General. The provisions of this section shall govern the construction, installation, alteration and repair of systems supplying *nonpotable reclaimed water*. Any use of *nonpotable reclaimed water* shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

CHAPTER 14
SUBSURFACE LANDSCAPE IRRIGATION SYSTEMS

SECTION 1401
GENERAL

1401.1 Scope. The provisions of Chapter 14 shall govern the materials, design, construction and installation of subsurface landscape irrigation systems connected to *nonpotable water* from on-site water reuse systems. Any use of *nonpotable water* for subsurface landscape irrigation shall be in strict compliance with applicable Colorado statutes and all applicable regulations of the Colorado Department of Natural Resources, Division of Water Resources and the Colorado Department of Public Health and Environment, Water Quality Control Commission, including "Regulation #86," 5 CCR 1002-86.

Amendments to the Boulder County Building Code

Amendments to the 2015 International Fuel Gas Code ("IFGC")

International Fuel Gas Code ("IFGC"), ~~2012~~ 2015 edition, published by the International Code Council. (ICC)

IFGC CHAPTER 1
ADMINISTRATION

~~*This chapter is deleted except for section 101.2.*~~ *Amend the Chapter 1 administrative provisions to correlate with other administrative amendments to the IBC, IRC, IEBC, etc., such as Right of Entry, Liability, Board of Review, etc.*

IFGC CHAPTER 4
GAS PIPING INSTALLATIONS

SECTION 406
INSPECTION, TESTING AND PURGING

DELETE this existing amendment. The published code test pressure is 1 ½ times the working pressure or 3 psi for a duration of 10 minutes. If contractors are used to testing at a higher pressure for a longer duration, that's fine, but why not go with the nationally recognized standard?

~~**Test pressure.** The test pressure to be used shall be not less than one and one-half times the proposed maximum working pressure, but not less than 10 psig (67 kPa gauge).~~

~~**Test duration.** Test duration shall be not less than ½ hour for each 500 cubic feet (14 m^3) of pipe volume or fraction thereof. When testing a system having a volume of less than 10 cubic feet (0.28 m^3) or a system in a single-family dwelling, the test duration shall be not less than 15 minutes. The duration of the test shall not be required to exceed 24 hours.~~

IFGC CHAPTER 6
SPECIFIC APPLIANCES

IFGC SECTION 602
DECORATIVE APPLIANCES FOR INSTALLATION IN FIREPLACES

DELETE this existing amendment. The current provisions of IFGC 602 and 303.3, etc., cover these areas. These amendments were written at a time when there were many more prescriptive requirements in the codes. Today, the published code language, the listing of the appliance and the manufacturer's installation and use instructions, which are an integral part of the listing, cover all of these areas.

~~**602.4 Gas logs in fireplaces.** In addition to the general requirements specified in Section 602 of The International Fuel Gas Code, gas logs installed in fireplaces shall comply with the requirements specified for heating equipment and heating appliances in this code. Approved gas-fired decorative log sets may be installed only in solid-fuel-burning fireplaces, provided:~~

~~1. The gas log is a listed appliance and is installed only in accordance with the manufacturer's instructions.~~

~~2. If the fireplace is equipped with a damper, it shall either be permanently blocked open, removed completely, or an opening or openings shall be cut in the damper to provide the minimum amount of opening prescribed in the manufacturer's instructions.~~

~~**Exception:** Damper clamps that are an integral part of a listed gas log assembly and are installed in accordance with the manufacturer's instructions are permitted.~~

~~3. The fireplace chimney shall comply with Sections 2101.3.1 and 2111 of the Building Code. The cross-sectional area of the flue passageway shall be in accordance with Figure 2113.16 for masonry chimneys and Section 805 for factory-built chimneys.~~

~~4. Gas logs shall be equipped with a pilot and listed safety shutoff valve.~~

~~5. Gas logs may be installed in factory-built fireplaces only if the factory-built fireplace is listed for the installation of a gas log and provided with a means for installation of the gas piping.~~

6. ~~Permanent combustion air opening(s), communicating directly with outside air, shall be provided in the firebox or in an area directly communicating with the room in which the fireplace is located when additional combustion air is required by Chapter 7 or if the gas log is installed in a bedroom.~~

Amendments to the Boulder County Building Code

Amendments to the ~~2012~~ 2015 International Energy Conservation Code

Note: The 2015 edition of the IECC either meets or exceeds our current requirements for commercial and multiple-family buildings. The proposal is to adopt the 2015 IECC as published, adding only renewable energy offsets for exterior fossil fuel consuming devices, electric vehicle charging station requirements for commercial parking lots, our existing amendments, very similar to our residential BuildSmart requirements, for retrofits to existing buildings, deconstruction instead of demolition and construction jobsite waste reduction and recycling; and noting, as our amendments do currently, that larger projects 25,000 square feet and over also require compliance with the International Green Construction Code ("IgCC").

International Energy Conservation Code (IECC), ~~2012~~ 2015 edition, published by The International Code Council (ICC), with amendments as follows:

CHAPTER 1 [CE] AND CHAPTER 1 [RE]
SCOPE AND ADMINISTRATION

Amend the Chapter 1 administrative provisions to correlate with other administrative amendments to the IBC, IRC, IEBC, etc., such as Right of Entry, Liability, Board of Review, etc. Add the following language to IECC Sections C101.5 and R101.5:

101.5 Compliance. Residential buildings shall meet the provisions of IECC [RE] Residential Provisions, except that one- and two-family dwellings and townhouses shall meet the BuildSmart requirements of the amended Chapter 11 of the *International Residential Code*. Commercial buildings shall meet the provisions of IECC [CE] Commercial Provisions. New commercial buildings or complexes of buildings located on the same parcel with over 25,000 square feet in total building floor area ~~and additions and remodels/renovations to existing commercial buildings that result in over 25,000 square feet in total building floor area~~ shall meet the amended provisions of the International Green Construction Code, 2012 edition, as adopted by Boulder County.

CHAPTER 2 [CE] AND CHAPTER 2 [CR]
DEFINITIONS

SECTIONS C202 AND R202
GENERAL DEFINITIONS

DECONSTRUCTION. The dismantling of an existing building or portion thereof without the use of heavy machinery or the destruction of the materials. Deconstruction includes the salvage of materials from the existing structure for recycling, resale, or reuse as an alternative to sending them to a landfill. There are two types of deconstruction, structural and non-structural deconstruction.

DECONSTRUCTION, NON-STRUCTURAL. Non-Structural deconstruction (also referred to as soft-stripping) is the removal and reclaiming of the reusable non-structural components such as appliances, cabinets, doors, windows, flooring, fixtures, and finish materials.

DECONSTRUCTION, STRUCTURAL. Structural deconstruction is the removal and reclaiming of the reusable structural components of a building, such as walls, floors, and roofs.

DECONSTRUCTION PROFESSIONAL. A professional engaged in the deconstruction field.

DEMOLITION. The tearing down of an existing structure and the disposal of its components or materials without the implementation of deconstruction techniques.

Add definitions identical to the IRC Chapter 11 definitions for deconstruction and demolition terms.

CHAPTER 3 [CE]
GENERAL REQUIREMENTS

Delete the existing amendments to Chapter 3.

IECC CHAPTER 4 [CE]
COMMERCIAL ENERGY EFFICIENCY

Delete the existing amendments to the tables and text in Chapter 4 [CE].

IECC CHAPTER 4 [RE]
RESIDENTIAL ENERGY EFFICIENCY

Delete the existing amendments to the tables and text in Chapter 4 [RE].

IECC CHAPTERS 5 [CE] AND 5 [RE]
~~WATER CONSERVATION~~
EXISTING BUILDINGS

Boulder County's previous amendments for water conservation are now incorporated into the 2015 IECC, so there is no need for water conservation amendments. There are also new Chapter 5s in the commercial and multiple-family residential provisions that eliminate the need for our current Chapter 6 amendments for existing buildings.

IECC CHAPTERS 6 [CE] AND 6 [RE]
~~ENERGY EFFICIENCY REQUIREMENTS FOR EXISTING PORTIONS OF BUILDINGS~~
DECONSTRUCTION

Renumber existing amendment Chapter 7 as Chapter 6 and retain existing amendments.

SECTIONS C601 AND R601
DECONSTRUCTION

601.1 General. All existing buildings and portions thereof requiring removal of building materials must be deconstructed as defined in Sections C202 and R202. *Demolition* is not permitted.

601.2 Penalty. Buildings demolished or partially demolished rather than deconstructed will, at the discretion of the building official, be issued a stop work notice for a period not exceeding 30 days.

601.2 Documentation of intent to deconstruct. Documentation of intent to deconstruct, consisting of a *deconstruction* plan, a written description of *deconstruction* work, or the County *Deconstruction* Checklist must be provided at building permit application. The documentation of intent to deconstruct must include: the name of the *deconstruction* contractor, a list of the materials to be recovered, donated, or reused, and the destination of the materials. The documentation must include both *nonstructural deconstruction* and *structural deconstruction*. Items which must be donated, sold, or re-used include: cabinets, dimensional lumber, flooring, and solid core doors.

601.3 Verification of *deconstruction* of a structure. The completion of *deconstruction* as approved on the *deconstruction* plan must be verified by the Building Division. The owner or *deconstruction professional* shall provide written verification of deconstruction by means of receipts or a written log, maintained by the homeowner or general contractor, which includes the volume or weight of materials and the destination where they were transported to the Building Safety & Inspection Services Division. Verification must be received prior to scheduling the rough inspections.

Renumber existing Chapter 9 amendments to Chapter 7.

IECC CHAPTERS ~~9~~ 7 [CE] AND ~~9~~ 7 [CR]
CONSTRUCTION JOBSITE WASTE REDUCTION AND RECYCLING

701.1 Construction jobsite waste reduction and recycling. All construction jobsite waste must be recycled, including wood, scrap metal, cardboard, and concrete. Labeled containers must be provided at the construction-site for use in capturing recyclable material. A mixed load container may be used if that container is being sent to a waste/recycling center that will verify the weight of recycled material recovered from that mixed load.

701.2 Documentation of intent to recycle. Documentation of intent to recycle which consists of a recycling plan, a written description of recycling activity, or the submittal of the County Recycling Checklist must be provided at building permit application. The documentation must specify the locations of recycling containers and the destination where material will be recycled.

701.3. Verification. Field inspection will be made by the Boulder County Building Division during the construction process to assure that recycling containers have been placed on-site. Prior to the final inspection, documentation must be provided to the Building Division office by the owner or waste/recycling contractor indicating the weight or volume of materials diverted from the waste stream. Materials that must be recycled include: appliances, concrete, metals, cardboard, and wood (except pressure treated or painted wood), and thermostats and other devices containing mercury. Other materials which are accepted by the waste/recycling contractor must also be recycled.

Renumber existing Chapter 10 amendments to Chapter 8.

IECC CHAPTERS ~~10~~ 8 [CE] AND ~~10~~ 8 [RE]
TRASH STORAGE AND RECYCLING AREAS

Section 1001 On-site recycling. The following standards shall apply to the construction of trash storage and recycling areas for attached dwellings and all business and industrial buildings or uses:

(a) Covered Area: Trash storage and recycling area shall be accommodated within the structure, or adequate common area shall be included on-site and indicated on a site plan.

(b) Hard Surface Required, Screening and Landscaping: All outdoor trash recycling storage and containers shall be placed on a hard surface, including, without limitation, concrete, and shall be screened.

(c) Maintenance and Service: Trash storage and recycling area shall include adequate space for the maintenance and servicing of containers for recyclable materials that are provided by local disposal and recycling companies.

(d) Adequate Space for Trash and Recyclables: The amount of space provided for the collection and storage of recyclable materials shall be at least as large as the amount of space provided for the collection and storage of trash materials.

(e) Convenience and Accessibility: The recycling area shall be must be at least as accessible and convenient for tenants and collection vehicles as the trash collection and storage area.

(f) Minimum Clearance: A minimum height clearance of eight feet shall be required if the space is provided in a covered enclosure.

IECC CHAPTERS ~~11~~ 9 [CE] AND ~~11~~ 9 [RE]
REFERENCED STANDARDS

Renumber Chapter 11 as Chapter 9 and modify remaining section numbers accordingly.

Amendments to the Boulder County Building Code

Modeled from the 2015 International Green Construction Code (IgCC)

International Green Construction Code, ~~2012~~ 2015, published by the International Code Council.

IGCC CHAPTER 1
SCOPE AND ADMINISTRATION

IGCC SECTION 101
GENERAL

[A] 101.1 Title. These regulations shall be known as the Green Construction Code of Boulder County, hereinafter referred to as "this code."

101.3 Scope. The provisions of this code shall apply to the design, construction, addition, alteration, change of occupancy, relocation, replacement, repair, equipment, building site, maintenance, removal and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures and to the site on which the building is located for new buildings~~, existing building additions, and alterations to existing buildings or complexes of buildings on the same property~~ over 25,000 square feet in total building floor area. Occupancy classifications shall be determined in accordance with the *International Building Code*® (IBC®).

IGCC CHAPTER 3
JURISDICTIONAL REQUIREMENTS

TABLE 302.1 REQUIREMENTS DETERMINED BY THE JURISDICTION.

Fill in the jurisdictional requirements in accordance with Section 302.1.

Section	Section Title or Description and Directives	Jurisdictional Requirements
CHAPTER 1. SCOPE AND ADMINISTRATION		
101.3 Exception 1.1	Detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories in height above grade plane with a separate means of egress, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	No
101.3 Exception 1.2	Group R-3 residential buildings, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	No
101.3 Exception 1.3	Group R-2 and R-4 residential buildings four stories or less in height above grade plane, their accessory structures, and the site or lot upon which these buildings are located, shall comply with ICC 700.	No
CHAPTER 4. SITE DEVELOPMENT AND LAND USE		
402.2.1	Flood hazard area preservation, general	Yes
402.2.2	Flood hazard area preservation, specific	Yes
402.3	Surface water protection	Yes
402.5	Conservation area	Yes
402.7	Agricultural land	Yes
402.8	Greenfield sites	Yes
407.4.1	High-occupancy vehicle parking	Yes
407.4.2	Low-emission, hybrid and electric vehicle parking	Yes
409.1	Light pollution control	Yes
CHAPTER 5. MATERIAL RESOURCE CONSERVATION AND EFFICIENCY		
503.1	Minimum percentage of waste material diverted from landfills	65%
CHAPTER 6. ENERGY CONSERVATION, EFFICIENCY AND CO EMISSIONS REPORTING		
302.1, 302.1.1, 602.1	zEPI of Jurisdictional Choice – The jurisdiction shall indicate a zEPI of 46 or less in each occupancy for which it intends to require enhanced energy performance.	Occupancy: All zEPI: 46
604.1	Automated demand response infrastructure	Yes
CHAPTER 7. WATER RESOURCE CONSERVATION, QUALITY AND EFFICIENCY		
702.7	Municipal reclaimed water	No
CHAPTER 8. INDOOR ENVIRONMENTAL QUALITY AND COMFORT		
804.2	Post-Construction Pre-Occupancy Baseline IAQ Testing	No
807.1	Sound transmission and sound levels	No
CHAPTER 10. EXISTING BUILDINGS		
1007.2	Evaluation and certification of existing buildings and building sites	No
1007.3	Post-certificate of occupancy annual net energy use, energy demand and CO^2e	No

Amendments to the Boulder County Building Code

Amendments to the 2015 International Code Council Performance Code

International Code Council Performance Code for Buildings and Facilities, ~~2012~~ <u>2015</u> Edition, published by the International Code Council, for use as a guide and a tool to evaluate proposals for modifications and for alternate materials, design and methods of construction and equipment in accordance with Sections 104.10 and 104.11, respectively, of the Boulder County Building Code.

Part I—Administrative

CHAPTER 1

GENERAL ADMINISTRATIVE PROVISIONS

SECTION 101
INTENT AND PURPOSE

Add a sentence to state that the adoption is for limited use.

101.1 Purpose. To provide appropriate health, safety, welfare, and social and economic value, while promoting innovative, flexible and responsive solutions that optimize the expenditure and consumption of resources. <u>This code is adopted only for use as a guide and a tool to evaluate proposals for modifications and for alternate materials, design and methods of construction and equipment in accordance with Sections 104.10 and 104.11, respectively, of the Boulder County Building Code.</u>

Validity, Repeals, and Effective Date

1. **Validity:** If any section, subsection, sentence, clause or phrase of this Resolution is, for any reason, held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this Resolution. The Board of County Commissioners hereby declares that it would have passed this Resolution, and each section, subsection, clause, or phrase thereof, irrespective of the fact that any one or more sections, subsections, sentences, clauses and phrases be declared unconstitutional.

2. **Repeals:** The following codes or regulations shall be repealed at the effective date of adoption of this Resolution:
   - International Building Code, ~~2009~~ 2012 Edition
   - International Residential Code ~~2009~~ 2012 Edition
   - International Mechanical Code ~~2009~~ 2012 Edition
   - International Fuel Gas Code ~~2009~~ 2012 Edition
   - International Energy Conservation Code ~~2009~~ 2012 Edition
   - National Electrical Code ~~2008~~ 2011 Edition
   - International Green Construction Code, ~~Public Version 2.0, 2010~~ 2012 Edition
   - ICC Performance Code, 2012 Edition

3. **Date Effective:** This Resolution shall be, and is hereby declared to be in full force and effect for all applications for building permits filed on or after January 1, ~~2013~~ 2016.

THIS RESOLUTION 2015-104 IS ADOPTED on this ____ day of _____, 2015, nunc pro tunc the ___ day of _____, 2015 as further specified in this Resolution, above.

BOULDER COUNTY BOARD OF COMMISSIONERS

_____ _____

DEB GARDNER, CHAIR ELISE JONES, VICE CHAIR

ATTEST:

_____ _____

Clerk to the Board CINDY DOMENICO, COMMISSIONER