AGENDA ITEM or FINAL CONTRACT REVIEW SUBMITTAL FORM

Agenda Item: 2015 ICC Building Codes

Action Requested: Discussion

Parties to the Agreement:

Term Begins: **Term Ends:** **Grant Contract #:**

Summary:

Staff recommendations for amendments and adoption of the 2015 ICC Building Codes

Fiscal Impact:

Submitted by: Crystal Lambert **Submitter's Email Address:** clambert@gunnisoncounty.org

Finance Review: ○ Required ◉ Not Required

Comments:

Reviewed by: Discharge Date:

County Attorney Review: ○ Required ◉ Not Required

Comments:

Reveiwed by: Discharge Date: Certificate of Insurance Required

Yes ○ No ○

County Manager Review:

Comments:

Reveiwed by: GUNCOUNTY1\mbirnie Discharge Date: 4/20/2017

○ Consent Agenda ○ Regular Agenda ○ Worksession Time Allotted: 90 minutes

Agenda Date: 4/25/2017

Revised April 2015

Gunnison County Community Development Department

Offices of Planning, Building and Environmental Health
221 N. Wisconsin St., Ste. D
Gunnison, CO 81230
Phone: (970) 641-0360 Fax: (970)641-8585

April 25, 2017

TO: **Board of County Commissioners**

FROM: **Crystal Lambert, Building & Environmental Health Official**

SUBJECT: **2015 ICC Building Codes**

Purpose:
The purpose of this item is to introduce the 2015 International Code Council (ICC) building codes which staff is recommending for adoption, to provide a list of proposed amendments to the codes, and to provide a discussion of the significant changes.

Background:
The ICC building codes adopted by Gunnison County include the International Building Code (IBC), International Residential Code (IRC), International Mechanical Code (IMC), International Fuel Gas Code (IFGC), and the International Energy Conservation Code (IECC). The 2009 editions of the IBC, IRC, IMC, IFGC, and the IECC were adopted, with amendments, in unincorporated Gunnison County on April 19, 2011, Resolution 11-16. Although new ICC codes are published every three years, Gunnison County has opted to update the building codes every six years. The six year cycle of adoption spares the local building community the burden of learning new code updates every three years and it saves money as new code books are expensive and the code adoption process is labor intensive.

The IRC is a complete and comprehensive code regulating the construction of single-family houses, two-family houses (duplexes) and buildings consisting of three or more townhouse units. The IRC contains coverage for all components of a house or townhouse, including structural components, fireplaces and chimneys, thermal insulation, mechanical systems, fuel gas systems, plumbing systems and electrical systems. Throughout Gunnison County, including the municipalities, plumbing and electrical systems are permitted and inspected through the State of Colorado Electrical Board and Plumbing Board.
The remaining building codes, other than the IRC, regulate the construction of everything but single-family houses, two-family houses and buildings consisting of three or more townhouse units.

There are four provisions within the 2015 IRC that may be considered as a significant change from the provisions in the currently adopted 2009 IRC: Section N1102.1.1: Insulation and Fenestration Criteria, Section N1102.4.1.2 Air Leakage Testing, Section 313 Automatic Fire Sprinkler Systems, and R303.4 Mechanical Ventilation.

To better understand the effects of these provisions in our community staff held a meeting with local building industry stakeholders to discuss these provisions and to identify the concerns, challenges, benefits, additional costs, and overall practicality for use in unincorporated Gunnison County. The stakeholder group was comprised of ten building industry professionals representative of the construction process, from design to build. The information, feedback, and ideas obtained from the stakeholder group is included in the discussion of these provisions. With the exception of automatic residential fire sprinkler systems, the remaining items were found not to be either significant or expensive changes.

Recommendation:
The following attachments are staff recommendations for amendments to the 2015 ICC building codes. A staff narrative, in blue italicized text, has been provided after each amendment to provide background and context. Additionally, where applicable, commentary provided by the Code Council has been included, in orange italicized text, to provide background on the intent behind the provisions.

Community Development Department staff presented the Gunnison County Planning Commission with the most significant code changes during two work sessions on March 3 and March 17, 2017. The building codes presented to the Planning Commission for discussion were the following:

- residential automatic fire sprinkler systems
- energy efficiency items of Chapter 11, including insulation and air leakage testing
- mechanical ventilation
- revised snow load data
- permit exemptions for accessory structures
- definition of Crawlspace
- definition of Gross Floor Area

The following code adoptions and amendments to the 2015 ICC building codes are reflective of the Planning Commission's unanimous recommendation for adoption as recorded during the April 7, 2017 meeting.

Attachment A: Amendments to the 2015 International Building Code
Attachment B: Amendments to the 2015 International Residential Code
Attachment C: Amendments to the 2015 International Fuel Gas Code
Attachment D: Amendments to the 2015 International Mechanical Code
Attachment E: Amendments to the 2015 International Energy Conservation Code
Attachment F: Discussion of Section R303.4 Mechanical ventilation
Attachment G: Discussion of Section N1102.1.2 Insulation and Fenestration Criteria

ATTACHMENT A
AMENDMENTS TO 2015 INTERNATIONAL BUILDING CODE

Section 101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section 101.4.3 Plumbing: Delete entire paragraph.
Represents no change from 2009 code adoption. The above code section was also deleted in the 2009 IBC adoption. It gives reference to using the IPC, which the State already adopts the IPC with amendments, and to the International Private Sewage Disposal Code, which Gunnison County uses the OWTS Regulations.

Section 101.4.4 Property maintenance: Delete entire paragraph.
Represents no change from 2009 code adoption. The above code section was also deleted in the 2009 IBC adoption. By reference, this code section would automatically apply provisions of the International Property Maintenance Code for the regulation of maintenance, use and occupancy of existing structures. The Property Maintenance Code could be looked at for use in unincorporated Gunnison County in the future.

Section 103 Department of Building Safety: Delete entire section.
Represents no change from 2009 code adoption. The above code section was also deleted in the 2009 IBC adoption. This is an administration code. The Community Development Department already has roles established for work in the Building Office.

Section 105.2 Work exempt from permit: Add paragraph 14 under Building subsection:

> No permit shall be required for non-residential buildings or portions of such buildings which are agricultural structures as defined in the *Gunnison County Land Use Resolution* and are part of an agricultural operation as defined in said *Land Use Resolution*. Requests for agricultural exemptions will be reviewed and approved by the Gunnison County Community Development Department prior to construction.

Represents no change from 2009 code adoption. The above added paragraph was also added in the 2009 IBC adoption.

Section 105.5.1 Expiration: The following paragraph shall be added:

> All below grade excavation done in advance of construction shall be filled and made safe within thirty (30) days of an abandoned project. Where construction has advanced beyond excavation all foundation work and above grade construction shall be secured against the weather and the construction site shall be otherwise returned to that condition as existed before the permit was issued.

Represents no change from 2009 code adoption. The above added paragraph was also added in the 2009 IBC adoption.

Section 109.2 Schedule of permit fees: Replace the entire paragraph with the following.

> On buildings, structures, or alterations requiring a permit, a fee for each permit shall be paid as requested, in accordance with Appendix L Permit Fee (2015 International Residential Code).
>
> 109.2.1: The Department of Regulatory Agencies, Colorado State Electrical Board and Colorado State Plumbing Board are responsible for electrical and plumbing fees, permits and inspections.

Represents no change from 2009 code adoption. The replaced paragraph above is the same as in the 2009 IBC adoption. Same fee schedule.

Section 109.3 Building permit valuations: The last sentence shall be deleted and the following shall be added:

In order to determine valuation for the various types of construction, building permit valuation shall be established according to the Building Valuation Data schedule as set forth in the most recent issue, at the time of the issuance of the building permit, of the Building Safety Journal, published by the International Code Council.

Represents no change from 2009 code adoption. Same as the 2009 IBC adoption.

Section 109.4 Work commencing before permit issuance: Replace paragraph with the following:

Any person who commences work before obtaining the necessary permits shall be subject to 100 percent (100%) of the building permit and plan review fees in addition to the required permit fees.

Represents no change from 2009 code adoption.

Section 109.5 Related fees: Add the following section:

Section 109.5.1 Plan review fees: A plan review fee shall be paid to cover the cost of review by Gunnison County Community Development Department. The plan review fee shall be 65% of the building permit fee. Additional plan review required by changes, additions or revisions to plans shall be charged a fee of $150.00 and review time beyond two hours shall be assessed at a rate of $100 per hour. If an independent plan review is required by the Building Official, the actual cost of such review along with administrative costs assessed at a rate of $75.00 per hour will be charged.

The above plan review fees were not part of the 2009 IBC adoption. They do reflect Resolution 15-8, passed by the BOCC on April 7, 2015.

Section 109.6 Refunds: Add the following refund policy:

The Building Official is authorized to refund building permit fees as follows.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than 80% of the building permit fee paid when no work has been done under a permit.

The Building Official is not authorized to refund any fee paid, except upon written application by the original permittee not later than 180 days after the date of fee payment.

Represents no change from 2009 code adoption.

Section 109.7 Re-inspection fees: Add section and paragraph.

A fee for re-inspection will be calculated at $75 per hour plus mileage to and from the site. Re-inspection fees will be due before the certificate of occupancy is issued.

Same as the 2009 IRC adoption but with an hourly rate increase from $42 as approved in Resolution 15-8, passed by the BOCC on April 7, 2015.

Section 202: Definitions. *In the 2009 IBC adoption, the definition of Gross Floor Area was amended to include the floor area within the outside perimeter of the exterior walls of the building. That amendment has not been included here because staff is proposing to keep*

the definition of Gross Floor Area as intended by the Code Council. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend staff's proposal to keep the definition of Gross Floor Area as provided in the 2015 IBC. The definition of Gross Floor Area as provided in the 2015 IBC is:

> *The floor area within the inside perimeter of the exterior walls of the building under consideration, exclusive of vent shafts and courts, without deduction for corridors, stairways, ramps, closets, the thickness of interior walls, columns or other features. The floor area of a building, or portion thereof, not provided with surrounding exterior walls shall be the usable area under the horizontal projection of the roof or floor above. The gross floor area shall not include shafts with no openings or interior courts.*

In the 2009 IBC adoption, a definition for crawlspace was created and included any space below the first floor of a building with a height of 60 inches or less. This space was then calculated as floor area for determining the building permit and Workforce Housing Linkage Fees. The IBC does not define the term crawlspace. Staff is proposing not to add a definition for Crawlspace. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend staff's proposal to not add a definition for Crawlspace in the 2015 IBC.

Section 504.3 Height in feet: Add the following paragraph:

> The provisions of this building code notwithstanding, no building may exceed the height limitations set forth in the Gunnison County Land Use Resolution. Section 13-103 H: *Allowed Structure Heights*.

Represents no change from 2009 code adoption.

Section 1608.2 Ground snow loads: Delete entire paragraph and replace with the following:

> The value of roof (or other member) snow load shall be equal to the "recommended basic snow load" as defined in "2016 Snow Load Design Data for Colorado", prepared and published by the "Structural Engineers Association of Colorado".

This represents a change from the 2009 code adoption. The ground snowload mapping for our area of Colorado designates that we are in a "case study" area where a site specific case study shall be made to determine the ground snow loads. Recently, the Structural Engineers Association of Colorado published such a study. This new data will replace our old roof snowload maps from 1971. Roof snowloads for structures will be determined by the design professional based on the structure, exposure, thermal and importance factors in accordance with ASCE/SEI 7. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend staff's proposal to use the "2016 Snow Load Design Data for Colorado", prepared and published by the "Structural Engineers Association of Colorado" for determination of snow loads.

ATTACHMENT B

AMENDMENTS TO 2015 INTERNATIONAL RESIDENTIAL CODE

Section R101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section R103 Department of Building Safety: Delete entire section.
Represents no change from 2009 code adoption.

Section R105.2 Work exempt from permit: Amend.

1. In paragraph 1 add the words "and is in compliance with the current Gunnison County Land Use Resolution".
2. Delete entire section referring to Electrical (1-5).

(There are 26 items listed in this code section for exemption from permit requirements) Staff is proposing to amend two of the items. Item #1 is a change from the 2009 code adoption. The 2015 IRC code text for item #1 is: "One-story detached accessory structures, provided that the floor area does not exceed 200 square feet." Staff is proposing to add the words "and is in compliance with the current LUR". The reason for this is the LUR provides setback distances from lot lines and waterbodies, among other development requirements. A customer would not need a building permit for a 200sf accessory structure but they do need to comply with the LUR. The definition of ***Accessory Structure is: A structure that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot****. To be exempt from a building permit under this requirement, a residence must be established on the lot for the "accessory structure" to be incidental to it. A customer could still place a 200sf structure on a parcel but they would need a building permit if the lot is vacant. This will be a change from the 2009 IRC adoption which limited exempt accessory structures to 120 square feet. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend staff's proposal to amend and adopt the accessory structure permit exemption.*
Item #2, electrical, represents no change from the 2009 code adoption.

Section R105.5.1 Expired work: Add Section.

All below grade excavation done in advance of construction shall be filled and made safe within thirty (30) days of an abandoned project. Where construction has advanced beyond excavation all foundation work and above grade construction shall be secured against the weather and the construction site shall be otherwise returned to that condition as existed before the permit was issued.

Represents no change from 2009 code adoption.

Section R108.2 Schedule of permit fees: Replace entire paragraph with the following.

On buildings, structures, or alterations requiring a permit, a fee for each permit shall be paid as requested, in accordance with Appendix L Permit Fee (2015 International Residential Code).

R108.2.1: The Department of Regulatory Agencies, Colorado State Electrical Board and Colorado State Plumbing Board are responsible for electrical and plumbing fees, permits and inspections.

Represents no change from 2009 code adoption.

Section R108.3 Building permit valuations: The following paragraph shall be added.

In order to determine valuation for the various types of construction, building permit valuation shall be established according to the Building Valuation Data schedule as

set forth in the most recent issue, at the time of the issuance of the building permit, of the Building Safety Journal, published by the International Code Council.

Represents no change from 2009 code adoption.

Section R108.4 Related fees: Add section:

A plan review fee shall be paid to cover the cost of review by Gunnison County Community Development Department. The plan review fee shall be 30% of the building permit fee. Additional plan review required by changes, additions or revisions to plans shall be charged a fee of $150.00 and review time beyond two hours shall be assessed at a rate of $100 per hour. If an independent plan review is required by the Building Official, the actual cost of such review along with administrative costs assessed at a rate of $75.00 per hour will be charged.

The above plan review fees were not part of the 2009 IRC adoption. They were adopted in Resolution 15-8, approved by the BOCC on April 7, 2015.

Section R108.5 Refunds: Add the following refund policy:

The Building Official is authorized to refund building permit fees as follows.

3. The full amount of any fee paid hereunder which was erroneously paid or collected.
4. Not more than 80% of the building permit fee paid when no work has been done under a permit.

The Building Official is not authorized to refund any fee paid, except upon written application by the original permittee not later than 180 days after the date of fee payment.

Represents no change from 2009 code adoption.

Section R108.6 Work commencing before permit issuance: Replace entire paragraph with the following.

Any person who commences work before obtaining the necessary permits shall be subject to 100 percent (100%) of the usual permit fee in addition to the required permit fees.

Represents no change from 2009 code adoption.

Section R108.7 Re-inspection fees: Add section and paragraph.

A fee for re-inspection will be calculated at $75 per hour plus mileage to and from the site. Re-inspection fees will be due before the Certificate of Occupancy is issued.

Same as the 2009 IRC adoption but with an hourly rate increase from $42 as approved in Resolution 15-8, passed by the BOCC on April 7, 2015.

Section R113.1 Unlawful acts: The following paragraph shall be added.

Before any building or structure may be moved into or within an unincorporated part of Gunnison County, a building permit shall be issued therefore in the same manner as for a new building or new construction. The cost for such a permit shall be based upon the Building Official's estimate of the probable cost involved and which will be necessary in order to make the building or structure comply with all the requirements for new buildings or structures in that area. In the event the owner shall not have taken steps necessary to make the building or structure comply with requirements of

the Building Code within the period of time for which the permit was issued, then and in that event the building shall be removed from the premises at the expense of the owner and upon the order or demand of the Community Development Department. The Building Official may refuse to issue a permit to move, remove or repair any such building or structure which, in their opinion, cannot be brought into compliance with the Building Code and which, even repaired, will be structurally unsafe.

Represents no change from 2009 code adoption.

Section R301.1.1 Height limitations: Add section and the following paragraph.

The provisions of this building code notwithstanding, no building may exceed the height limitations set forth in the Gunnison County Land Use Resolution. Section 13-103 H: Allowed Structure Heights.

Represents no change from 2009 code adoption.

Table R301.2(1) Climatic and geographic design criteria: Amend to add the following values in the spaces provided.

Ground Snow Load: Varies. The value of roof (or other member) snow load shall be equal to the "recommended basic snow load" as defined in the "2016 Colorado Design Snow Loads", prepared by the "Structural Engineers Association of Colorado". ASCE 7 procedures shall be used to convert to roof snow loads.

Wind Design:

Speed (mph):115 (ultimate design wind speed)
Topographic effects: no
Special wind region: no
Wind-borne debris zone: no

Seismic design category: B for site soil classification D

Subject to damage from:

Weathering: Severe
Frost line depth: 30 inches
Termite: none to slight

Winter Design Temp: -20F

Ice Barrier Underlayment Required: Yes

Flood Hazard: 1989, Resolution 89-31, 2011 FIRM maps

Air Freezing Index: 3447 (BF-days-100year)

Mean Annual Temp: 37.2F

This represents a change from the 2009 code adoption. The ground snow load mapping for our area of Colorado designates that we are in a "case study" area where a site specific case study shall be made to determine the ground snow loads. Recently, the Structural Engineers Association of Colorado published such a study. This new data will replace our old roof snow load maps from 1971. Roof snow loads for structures will be determined by the design professional based on the structure, exposure, thermal and importance factors in accordance with ASCE/SEI 7. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend staff's proposal to use the "2016 Snow Load Design Data for Colorado", prepared and published by the "Structural Engineers Association of Colorado" for determination of snow loads.

Section R302.5.1 Opening protection: Add following sentence at end of paragraph.

These doors shall be tight fitting to prevent exposure from potential garage carbon monoxide gases.

Represents no change from 2009 code adoption.

Staff is not proposing to amend ***Section R303.4 Mechanical ventilation*** *as provided in the text of the 2015 IRC. This section requires, that when the air exchange rate of a dwelling is found to be less than 5 air changes per hour or less, the dwelling unit shall be provided with whole-house mechanical ventilation. Whole-house Mechanical Ventilation System is defined by the code as: An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate.*

> ***Please note:*** *There is no mention of heat recovery in this definition. The whole-house mechanical ventilation can be as simple as a modern bathroom fan or as complex as desired.*

Section R313 Automatic Fire Sprinkler Systems:

This code section contains two subsections, one section refers to townhouse structures, and the second refers to one- and two-family dwellings. The text of this code section does not change between the 2009 and the 2015 codes. Both of these sections, as written in the text of the code, require that all residential structures be provided with automatic fire sprinkler systems. Both of these sections were deleted in the 2009 code adoption and replaced with an acknowledgement of the Crested Butte Fire Protection District's adopted fire code and standards.

Commentary provided by the code council: Residential occupancies are the number one group of occupancies that suffer loss of life during fire events. A published study by the National Institute of Standards and Technology (NIST) entitled Benefit-cost Analysis of Residential Fire Sprinkler Systems, reports that, out of almost 2,000 fire incidents in homes equipped with fire sprinklers during the 4-year period 2002 to 2005, there were no fire-related fatalities. This statistic demonstrates the potential for sprinklers to save lives that would otherwise be lost in residential fires.

Residential automatic fire sprinkler systems can be either an NFPA 13D system or a multi-purpose system. NFPA 13D systems are separate from the domestic plumbing systems; there is a tee separating the domestic plumbing system and the fire sprinkler system. NFPA systems are required to be installed by a licensed fire protection contractor. Inspection of an NFPA 13D system would be by the Fire Marshall of the jurisdiction.

Multi-purpose systems use the same piping to supply domestic plumbing fixtures and fire sprinklers. The provisions for installing the multi-purpose sprinkler systems are found in the plumbing section of the 2015 IRC. A multi-purpose sprinkler system is similar to the NFPA 13D system but it is covered under the plumbing provisions on the 2015 IRC instead of by the fire code as a National Fire Protection District (NFPA) Standard. Andy Clark, our local State Plumbing Inspector explained that any state licensed plumber can install the multi-purpose system as prescribed in the code. Manufacturers of multi-purpose sprinkler system components may require additional training and certifications for the installation of their products. The licensed plumber installing a multi-purpose system may also need to attain additional liability insurance above their basic required amount.

The stakeholder group discussed the requirements for automatic fire sprinkler systems which resulted in list of pros and cons. The pros of the 2015 IRC building code provisions for automatic fire sprinkler systems (residential only) were an increased level of life safety

for the occupants of structures far from emergency service and that an increased volume of systems would eventually reduce the overall price of systems locally. The cons were an increase to the cost of construction; concern over systems freezing in the winter and causing property damage; concern that structures with sprinklers will either always need to be heated or the sprinkler system drained when not occupied; difficulty of system draining and re-pressurizing for seasonal use structures; and concern that the price increase to construction will reduce availability of free market affordable housing. The stakeholder group suggested that the County focus on promoting automatic fire sprinklers as an optional choice.

The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend adoption of the residential automatic sprinkler system requirement for townhouses as provided in the 2015 IRC. A townhouse is defined as "a single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from foundation to roof and with a yard or public way on not less than two sides." The full 2015 code text for townhouse automatic fire sprinkler systems is below:

> **Section R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in townhouses.
>
> **Exception:** An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.
>
> **Section 313.1.1 Design and installation.** Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with Section 92904 or NFPA 13D.

Staff proposes to amend the residential automatic sprinkler system requirements for one- and two-family dwellings as provided in the 2015 IRC. This section requires that all new one- and two-family dwellings have automatic fire sprinkler systems. Staff recommends an amendment to the text of this section that would require one- and two-family dwellings, over 3,600 square feet, to install residential automatic fire sprinkler systems. The aggregate floor area will be counted (minus any attached garage areas) for two-family dwellings, only if the dwelling units are not separated with a 2 hour fire-resistant rated party wall, otherwise the floor area of the units will be counted separately. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend the proposed amendment and adopt the residential automatic sprinkler system requirement for one- and two-family dwellings.

The International Fire Code identifies 3,600 square feet structures as needing more water for fire-fighting purposes than structures less than 3,600 square feet. Larger structures require additional firefighters and water for fire suppression and can require more fire service than one tanker truck can handle. The distances that occupants of larger structures need to traverse in order to evacuate can also be greater. The recommended text is:

> **Section R313.2 One- and two-family dwellings automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in one-family dwellings when the Floor Area exceeds 3,600 square feet. An automatic residential fire sprinkler system shall be installed in two-family dwellings when the aggregate floor area exceeds 3,600 square feet. A 2-hour fire resistance rated party wall, installed in accordance with

Section 706 of the 2015 IBC, shall be acceptable to separate the dwellings units into separate one-family dwellings for purposes of this section.

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

Section 313.1.1 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section 92904 or NFPA 13D.

Staff recommends adoptions of **Section N1102.1.2 Insulation and Fenestration Criteria (Prescriptive)**. This section represents only one of the five different options, the prescriptive option, for complying with **Chapter 11 Energy Efficiency**. *The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to recommend adoption of section N1102.1.2 Insulation and Fenestration Criteria (Prescriptive) of the 2015 IRC. A* discussion of the options for compliance with Chapter 11 is provided in Appendix G.

Section N1102.4.1.2 Testing *is a subsection of* ***Section N1102.4 Air Leakage****. These sections are found in* ***Chapter 11: Energy Efficiency*** *of the 2015 IRC and require that all new residential structures be tested for air leakage during construction and achieve an air exchange rate of three air changes per hour or less. The energy efficiency provisions of the building codes are focused on providing a minimum level of comfort for the occupants of the structure and achieving affordability to maintain that level of comfort. Staff proposes adoption of the air leakage testing requirement but deletion of the requirement to achieve a certain air exchange rate. The Gunnison County Planning Commission, during the April 7, 2017 meeting, voted unanimously to amend and adopt the air leakage testing requirement.*

The process of conducting the air leakage testing will identify any problem areas for builders, homeowners, and designers and provide information that can be used to increase the efficiency of a structure which may be shared and carry over into future projects. The act of testing promotes an awareness of a structures' air tightness performance and is educational for contractors and property owners.

The current 2009 IRC requires either a visual inspection of the thermal envelope or air tightness testing with an air exchange rate achieved of less than seven per hour for compliance with Chapter 11: Energy Efficiency. To date, we have not had a builder choose to do the air tightness testing in lieu of the visual inspection by staff. When conducting the visual inspection, staff can observe that insulation is installed and that window and door openings have been foamed but it's impossible to verify or confirm the air tightness of a structure. The air tightness test, by itself, can greatly improve the performance of a structure. During testing, leaks are identified and can be remedied and sealed(caulk, can of foam, tape, etc.), making the structure more efficient and air tight. The air tightness testing can reveal to builders and contractors any common weakness areas in the construction which will make future work and projects even better. For the homeowner builder or out-of-town builder that is only going to build one house, the air tightness testing will provide a large advantage towards an efficient and well-built structure, as they are probably not used to taping seams and caulking holes. The tester does spend time with the builder and goes over any problem or weak areas that can be improved.

The test alone is a soft introduction for the local building industry, rather than requiring achievement of a certain air exchange rate (also tied to a requirement for mechanical ventilation). The test can be done at any time after all of the penetrations are created in the building envelope and before the final inspection which will help alleviate scheduling concerns for builders. The air-tightness testing will be an added cost to the building construction of $300 to $600. The results of the air tightness testing will become part of the building certificate that is posted in the utility area and also recorded in the Building Office's permit records.

Commentary provided by the code council: *Sealing the building envelope is critical to good thermal performance of the building. The seal will prevent warm, conditioned air from leaking out around doors, windows and other cracks during the heating season, thereby reducing the cost of heating the residence. During hot summer months, a proper seal will stop hot air from entering the residence, helping to reduce the air-conditioning load on the building. Any penetration in the building envelope must be thoroughly sealed during the construction process, including holes made for the installation of plumbing, electrical, and heating and cooling systems. The code lists several areas that must be caulked, gasketed, weatherstripped, wrapped or otherwise sealed to limit uncontrolled air movement. Most of the air sealing will be done prior to the installation of an interior wall covering because any penetration will be noticeable and accessible at this time. The code allows the use of airflow retarders (house wraps) or other solid materials as an acceptable method to meet this requirement. To be effective, the building thermal envelope seal must be:*

- *Impermeable to airflow*
- *Continuous over the entire building envelope*
- *Able to withstand the forces that may act on it during and after construction*
- *Durable over the expected lifetime of the building*

It is unlikely that the same type of barrier will be used on all portions of the building's thermal envelope. Therefore, joints between the various elements, as well as joints or splices within products (such as the overlap in separate pieces of the house wrap), must be effectively addressed to provide the continuity needed to perform as desired.

Air infiltration is a major source of energy use because the incoming air usually requires conditioning. The uncontrolled introduction of outside air (infiltration) creates a load that varies with time. Ventilation, the controlled introduction of fresh air, is more manageable and provides a more controlled air quality.
Uncontrolled infiltration also has a tendency to create or aggravate moisture problems, providing an additional reason to limit infiltration.

The following is staff's proposal to amend the testing subsection of the air leakage testing:

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

1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed, beyond the intended weatherstripping or other infiltration control measures.
2. Dampers including exhaust, intake, makeup air, backdraft and flue dampers shall be closed, but not sealed beyond intended infiltration control measures.
3. Interior doors, 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.

Section G2406.2 Prohibited locations: Delete exceptions 3 and 4.
Represents no change from 2009 code adoption.

Section G2425.8 Appliances not required to be vented: Delete item number 7.
Represents no change from 2009 code adoption.

Section G2445 Unvented room heaters: Delete all paragraphs (Sections G2445.1-G2445.7) and add the following.

Section G2445 Unvented room heaters prohibited: Unvented room heaters utilizing fuel combustion are prohibited in all locations throughout all occupancies.

All of the above Sections that begin with "G" refer to gas fueled unvented room heaters, which have not been allowed in Gunnison County. These are the same amendments as in the 2009 IRC.

Appendix F Radon Control Methods: Include the entire section.
Same as in the 2009 IRC adoption. As we are in a high radon area, passive control systems are installed during construction. After completion, the radon level is tested and, if high, the passive system can become active and bring radon levels down.

Appendix L Permit Fees: Include the entire section.
Represents no change from 2009 code adoption.

ATTACHMENT C

AMENDMENTS TO 2015 INTERNATIONAL FUEL GAS CODE

Section 106.6.2 Fee schedule: Replace the entire section with the following.

A permit shall not be valid until all fees prescribed by the most current Gunnison County Community Development fee schedule are paid in full, nor shall an amendment to the permit be released until the additional fees, if any, have been paid.

The fee schedule for mechanical permits would be a change for Gunnison County. The Community Development Department will be proposing a fee schedule in order to cover the cost of mechanical inspections for work not included or covered under a building permit.

Section 106.6.3 Fee refunds: Replace #2 with the following and delete #3.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than 80 percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.

Represents no change from 2009 code adoption.

Section 109 Means of appeal: Replace the entire section with the following:

Section 109.1 Appeals shall be in accordance with 2015 IBC Section 113 as amended.

Section 303.3 Prohibited locations: Delete exception 3 and 4.

Represents no change from 2009 code adoption.

Section 501.8 Appliances not required to be vented: Delete item number 8 and 10.

Represents no change from 2009 code adoption.

Section 621 Unvented room heaters: Delete all paragraphs (section 621.1 through 621.7) and replace with the following:

Section 621 Unvented room heaters prohibited:

Unvented room heaters utilizing fuel combustion are prohibited in all location throughout all occupancies.

Represents no change from 2009 code adoption.

ATTACHMENT D

AMENDMENTS TO 2015 INTERNATIONAL MECHANICAL CODE

Section 106.5.2 Fee schedule: Replace the entire section with the following:

A permit shall not be valid until all fees prescribed by the most current Gunnison County Community Development fee schedule are paid in full, nor shall an amendment to the permit be released until the additional fees, if any, have been paid.

The fee schedule for mechanical permits would be a change for Gunnison County. The Community Development Department will be proposing a fee schedule in order to cover the cost of mechanical inspections for work not included or covered under a building permit.

Section 106.5.3 Fee refunds: Replace #2 with the following and delete #3.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than 80 percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.

Represents no change from 2009 code adoption.

Section 109 Means of appeal: Replace the entire section with the following:

Section 109.1 Appeals shall be in accordance with 2015 IBC Section 113 as amended.

Section 903.3 Unvented gas log heaters: Replace the entire paragraph with the following:

Unvented gas log heaters are prohibited in all location throughout all occupancies.

Represents no change from 2009 code adoption.

ATTACHMENT E
AMENDMENTS TO 2015 INTERNATIONAL ENERGY CONSERVATION CODE

Section C101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements, Exception 1: Replace paragraph with the following:

1. Mechanical systems and service water heater systems in buildings where the total mechanical equipment capacity is less than 600,000 Btu/h combined service water-heating or space-heating capacity or 480,000 Btu/h cooling capacity.

This proposed amendment is correcting errata. The proponent of this code section intended that mechanical systems be checked by the design professional when either the heating load or cooling load was above a certain Btu/h.

Section R101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section R202 General Definitions: Replace the definition of Residential Building with the following:

Residential Building. For this code, includes all residential structures that are not detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plan in height, and required to comply with the *International Residential Code*.

This proposed amendment is clarifying that residential structures that would normally be built under the IRC, to remain under the IRC. Chapter 11: Energy Efficiency of the IRC is a duplicate of the residential provisions of the IECC.

ATTACHMENT F

Discussion of **Section R303.4 Mechanical Ventilation** for which no amendment is recommended

A section of the 2015 IRC for which staff is not proposing to amend is ***Section 303.4 Mechanical Ventilation***. The section says that were the air infiltration rate of a dwelling unit is 5 air changes per hour or less, the dwelling unit shall be provided with whole-house mechanical ventilation. Whole-house Mechanical Ventilation System is defined by the code as: An exhaust system, supply system, or combination thereof that is designed to mechanically exchange indoor air for outdoor air where operating continuously or through a programmed intermittent schedule to satisfy the whole-house ventilation rate.

> **Please note:** There is no mention of heat recovery in this definition. The whole-house mechanical ventilation can be as simple as a bathroom fan or as complex as desired.

If a heat recovery ventilation system is chosen to be installed, which would be above and beyond what the code requires, a simple thru-wall decentralized HRV for a smaller space can be $1500 to $2000 and a more complex centralized system can range from $3,500 to $6,500.

> **Commentary provided by the code council:** *Multiple studies have shown that natural ventilation alone is not sufficient for dwellings that are tightly sealed such that their infiltration rate is below 5 air changes per hour (ACH). Section R303.4 sets the threshold for tightly sealed at 5 ACH at a 50 Pascal pressure differential between the indoors and outdoors (5ACH50). For perspective, 50 Pa=0.2 inch water column; 1 inch water column=250Pa. Traditionally, 0.35 ACH or 15 cfm per occupant has been the required mechanical ventilation rate allowed as an alternative to natural ventilation. An ACH of 0.35 at typical ambient pressure differentials is roughly equivalent to 7 to 10 ACH at a 50 Pa differential, thus the threshold of 5 ACH50 is comparable to the traditional ventilation rate. If the blower door test required by Section N1102.4.1.2 of the code indicates that the infiltration rate is less than 5 ACH50, the dwelling must be provided with whole-house mechanical ventilation. As dwelling envelopes become more air tight, there is evidence that indoor contaminant levels are rising. Poor indoor air quality, the inability to predict ventilation rates from natural ventilation and the decreasing rates of infiltration have all led to this requirement for mechanical ventilation in dwellings.*

The following code section is from Chapter 15 of the 2015 IRC and describes the requirements for Whole-house Mechanical Ventilation.

Chapter 15: Exhaust Systems, Section M1507: Mechanical Ventilation

> **Section M1507.3 Whole-house mechanical ventilation system:** Whole-house mechanical ventilation systems shall be designed in accordance with Sections M1507.3.1 through M1507.3.3.
>
> **Commentary provided by the code council:** *All habitable rooms are required by Section 303.1 to be provided with natural ventilation through windows, doors or other approved openings, with an option for mechanical ventilation in accordance with this section. For years natural ventilation has been used which relied on the occupants to open windows and doors to provide ventilation to dwellings. While natural ventilation is still allowed, concerns over indoor air quality have raised questions over the effectiveness of naturally ventilating a dwelling. There are provisions in the code that allow mechanical ventilation to be provided instead of natural ventilation, and, in some cases, require mechanical ventilation to be provided. Section R303.4 will require a*

dwelling to be provided with whole-house mechanical ventilation when natural ventilation alone is not sufficient for dwellings that are tightly sealed such that their infiltration rate is 5 or fewer air changes per hour at an indoor/outdoor pressure differential of 50 Pa.

M1507.3.1 System Design: The whole-house ventilation system shall consist of one or more supply or exhaust fans, or a combination of such, and associated ducts and controls. Local exhaust or supply fans are permitted to serve as such a system. Outdoor air ducts connected to the return side of an air handler shall be considered as providing supply ventilation.

M1507.3.2 System Controls: The whole-house mechanical ventilation system shall be provided with controls that enable manual override.

M1507.3.3 Mechanical Ventilation Rate: The whole-house mechanical ventilation system shall provide outdoor air at a continuous rate of not less than that determined in accordance with Table M1507.3.3(1).

Exception: The whole-house mechanical ventilation system is permitted to operate intermittently where the system has controls that enable operation for not less than 25-percent of each 4-hour segment and the ventilation rate prescribed in Table M1507.3.3(1) is multiplied by the factor determined in accordance with Table M1507.3.3(2).

Table M1507.3.3(1)
Continuous whole-house mechanical ventilation system airflow rate requirements

Dwelling unit floor area (sf)	Number of bedrooms				
	0-1	2-3	4-5	6-7	>7
	Airflow in cfm				
<1,500	30	45	60	75	90
1,501-3,000	45	60	75	90	105
3,001-4,500	60	75	90	105	120
4,501-6,000	75	90	105	120	135
6,001-7,500	90	105	120	135	150
>7,500	105	120	135	150	165

Table M1507.3.3(2) Intermittent whole-house mechanical ventilation rate factors[a,b]

Run-time percentage in each 4-hour segment	25%	33%	50%	66%	75%	100%
Factor[a]	4	3	2	1.5	1.3	1.0

a. For ventilation system run time values between those given, the factors are permitted to be determined by interpolation.
b. Extrapolation beyond the table will not be approved.

ATTACHMENT G

Discussion of **Section N1102.1.2 Insulation and Fenestration Criteria (Prescriptive)** for which no amendment is recommended

A section in the 2015 IRC for which staff recommends adoption is **Section N1102.1.2 Insulation and Fenestration Criteria (Prescriptive)**. This section represents only one of the five different options, the prescriptive option, for complying with **Chapter 11 Energy Efficiency**. This section says that, if the prescriptive option is chosen, continuous wall insulation shall be installed in addition to wall cavity insulation. Continuous wall insulation can be installed on either the interior side or exterior side of a structure and is meant to reduce thermal bridging effects of wood studs (where no insulation typically exists and which can account for 25% of each wall surface area). This section, the prescriptive option, represents the most severe and costly compliance option but it is the easiest to understand because it simply tells a builder/designer what to do. If a builder/designer choses to utilize this method for thermal envelope compliance, then they mean to install continuous insulation. A more cost effective and flexible approach is to use the UA-tradeoff method of compliance. This method does not require continuous wall insulation but it can be used if desired. Staff is proposing not to amend this section of the code and to, instead, provide training classes for using the UA-tradeoff method.

Many of our customers rely on using the UA-tradeoff method for showing compliance with the energy efficiency provisions of the code during their building permit submittal. Anyone building a log walled, or alternative materials, structure uses the UA-tradeoff method. It is virtually impossible to amend the UA-tradeoff method, therefore, amending the prescriptive table but not the UA-tradeoff method would ultimately require some structures to achieve a higher standard than others.

According to many energy efficiency professionals, the level of thermal insulation required by the 2015 IRC has reached the energy savings/cost of materials tipping point. We will likely not be seeing significant increases to thermal insulation requirements in future code editions. This point was brought up by August Hasz, PE, during the stakeholder group meeting.

The stakeholder group recognized that the UA-tradeoff method can save money over the prescriptive method and also that it can provide an increased amount of flexibility in a project. Overall, comments in favor of the energy efficient provisions of the 2015 IRC included reduced energy costs which help the cost of living and an increased amount of flexibility with using the performance based options. Some of the concerns raised in the stakeholder meeting, relating to the energy efficient provisions, were possible construction errors, reduced freedom to have a house that breathes passively, and that lenders, banks, and appraisers do not value energy efficient construction.

The following is a brief description of the different compliance options available to a building or designer using the 2015 IRC:

Option 1: Section N1102.1.2 Insulation and Fenestration Criteria (prescriptive) using Table N1102.1: Insulation and Fenestration Requirements by Component uses a simple table that list the minimum required R-value of insulation for different building thermal envelope components. The table is used for the R-value computation method of

compliance. This is a popular compliance path because it is easy to use and understand, however, it can also be the most costly. Credit is only given for insulation materials and this method does not care how many or how few windows a wall has. For comparison, the red text signifies the requirements under the 2009 IRC table.

2015 IRC, Table N1102.1

Fenestration U-factor	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value[i]	Floor R-Value	Basement Wall R-Value[C]	Slab[d] R-value and depth	Crawl Space[c] Wall R-Value
0.32 ~~0.35~~	49	20-5 or 13-10[h] ~~21~~	19/21	38[g] ~~30[g]~~	15/19 ~~10/13~~	10, 4ft	15/19 ~~10/13~~

c. "15/19" means R-15 continuous insulation on the interior or exterior or R-19 cavity insulation at the interior. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior plus R-5 continuous insulation on the interior or exterior.
d. R-5 shall be added to the required slab edge R-value for heated slabs.
g. Or insulation sufficient to fill the framing cavity, R-19 minimum.
h. The first value is cavity insulation, the second value is continuous insulation.
i. The second R-value applies when more than half the insulation is on the interior of the mass wall.

Option 2: Table N1102.1.2: Equivalent U-factors option uses a table that lists the maximum U-factors of assemblies. This table is used for the U-factor alternative method of compliance. The total U-factor of an assembly (or part of an assembly) is calculated based on the building materials in the assembly. Drywall, sheathing, air films, studs, headers, etc. are all counted. Construction types that limit the amount of framing or include thermal breaks benefit from using this method. For comparison, the red text signifies the requirements under the 2009 IRC table.

2015 IRC, Table N1102.1.2 Equivalent U-Factors

Fenestration U-factor	Ceiling U-Factor	Frame Wall U-Factor	Mass Wall U-Factor	Floor U-Factor	Basement Wall U-Factor	Crawl Space Wall U-Factor
0.32 ~~0.35~~	0.026	0.045 ~~0.057~~	0.057	0.028 ~~0.033~~	0.050 ~~0.059~~	0.055 ~~0.065~~

Please note: The two method options above, R-value computation and U-factor alternative, can be combined to show compliance. For example, ceilings and floors can use the R-value table and then a designer could show that the frame wall U-Factor is less than the equivalent U-Factor Table (if the builder or designer does not want to use continuous insulation, for example).

Option 3: Total UA-alternative: This method allows for one portion of a building to make up for another portion and looks at the total overall thermal performance of a structure. A free software program, called REScheck, makes it fast and easy for builders and designers to determine if a structure meets the minimum thermal requirements of the code. This method can also save money when compared to Option 1, the prescriptive table.

Option 4: Simulated Performance Alternative: This method allows a builder or designer to show that a proposed design will meet the intent of the code for energy-efficiency when compared against a standard reference design. REScheck software can be used to show

compliance with this method. Additionally, home energy raters can also provide this type of analysis. This method allows for energy supplied by renewable energy sources on the building site to be discounted from the total energy consumption of the proposed design. This method also gives credit for energy efficient heating systems.

Option 5: Above the Code Programs: If an energy-efficiency program exceeds the energy efficiency required by the code, then compliance with that program would automatically be considered as compliance with the building code and the building office would defer to the requirements of that program. There are many above the code programs available, such as EnergyStar or PassiveHouse.

ATTACHMENT A

AMENDMENTS TO 2015 INTERNATIONAL BUILDING CODE

Section 101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section 101.4.3 Plumbing: Delete entire paragraph.

The above code section was also deleted in the 2009 IBC adoption. It gives reference to using the IPC, which the State already adopts the IPC with amendments, and to the International Private Sewage Disposal Code, which Gunnison County uses the OWTS Regulations.

Section 101.4.4 Property maintenance: Delete entire paragraph.

The above code section was also deleted in the 2009 IBC adoption. By reference, this code section would automatically apply provisions of the International Property Maintenance Code for the regulation of maintenance, use and occupancy of existing structures. The Property Maintenance Code could be looked at for use in unincorporated Gunnison County in the future.

Section 103 Department of Building Safety: Delete entire section.

The above code section was also deleted in the 2009 IBC adoption. This is an administration code. The Community Development Department already has roles established for work in the Building Office.

Section 105.2 Work exempt from permit: Add paragraph 14 under Building subsection:

> No permit shall be required for non-residential buildings or portions of such buildings which are agricultural structures as defined in the *Gunnison County Land Use Resolution* and are part of an agricultural operation as defined in said Land Use resolution. Requests for agricultural exemptions will be reviewed and approved by the Gunnison County Community Development Department prior to construction.

The above added paragraph was also added in the 2009 IBC adoption.

Section 105.5.1 Expiration: The following paragraph shall be added:

> All below grade excavation done in advance of construction shall be filled and made safe within thirty (30) days of an abandoned project. Where construction has advanced beyond excavation all foundation work and above grade construction shall be secured against the weather and the construction site shall be otherwise returned to that condition as existed before the permit was issued.

The above added paragraph was also added in the 2009 IBC adoption.

Section 109.2 Schedule of permit fees: Replace the entire paragraph with the following.

> On buildings, structures, or alterations requiring a permit, a fee for each permit shall be paid as requested, in accordance with Appendix L Permit Fee (2015 International Residential Code).
>
> 109.2.1: The Department of Regulatory Agencies, Colorado State Electrical Board and Colorado State Plumbing Board are responsible for electrical and plumbing fees, permits and inspections.

The replaced paragraph above is the same as in the 2009 IBC adoption. Same fee schedule.

Section 109.3 Building permit valuations: The last sentence shall be deleted and the following shall be added:

> In order to determine valuation for the various types of construction, building permit valuation shall be established according to the Building Valuation Data schedule as set forth in the most recent issue, at the time of the issuance of the building permit, of the Building Safety Journal, published by the International Code Council.

Same as the 2009 IBC adoption.

Section 109.4 Work commencing before permit issuance: Replace paragraph with the following:

Any person who commences work before obtaining the necessary permits shall be subject to 100 percent (100%) of the building permit and plan review fees in addition to the required permit fees.

Same as the 2009 IBC adoption.

Section 109.5 Related fees: Add the following section:

Section 109.5.1 Plan review fees: A plan review fee shall be paid to cover the cost of review by Gunnison County Community Development Department. The plan review fee shall be 65% of the building permit fee. Additional plan review required by changes, additions or revisions to plans shall be charged a fee of $150.00 and review time beyond two hours shall be assessed at a rate of $100 per hour. If an independent plan review is required by the Building Official, the actual cost of such review along with administrative costs assessed at a rate of $75.00 per hour will be charged.

The above plan review fees were not part of the 2009 IBC adoption. They do reflect Resolution 15-8, passed by the BOCC on April 7, 2015.

Section 109.6 Refunds: Add the following refund policy:

The Building Official is authorized to refund building permit fees as follows.

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than 80% of the building permit fee paid when no work has been done under a permit.

The Building Official is not authorized to refund any fee paid, except upon written application by the original permittee not later than 180 days after the date of fee payment.

Same as the 2009 IBC adoption, no change.

Section 109.7 Re-inspection fees: Add section and paragraph.

A fee for re-inspection will be calculated at $75 per hour plus mileage to and from the site. Re-inspection fees will be due before the certificate of occupancy is issued.

Same as the 2009 IRC adoption but with an hourly rate increase from $42 as approved in Resolution 15-8.

Section 504.3 Height in feet: Add the following paragraph:

The provisions of this building code notwithstanding, no building may exceed the height limitations set forth in the Gunnison County Land Use Resolution. Section 13-103 H: *Allowed Structure Heights*.

Same as the 2009 IBC adoption, no change

Section 1608.2 Ground snow loads: Delete entire paragraph and replace with the following:

The value of roof (or other member) snow load shall be equal to the "recommended basic snow load" as defined in "2016 Snow Load Design Data for Colorado", prepared and published by the "Structural Engineers Association of Colorado".

The ground snowload mapping for our area of Colorado designates that we are in a "case study" area where a site specific case study shall be made to determine the ground snow loads. Recently, the Structural Engineers Association of Colorado published such a study. This new data will replace our old roof snowload maps from 1971. Roof snowloads for structures will be determined by the design professional based on the structure, exposure, thermal and importance factors in accordance with ASCE/SEI 7.

ATTACHMENT B

AMENDMENTS TO 2015 INTERNATIONAL RESIDENTIAL CODE

Section R101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section R103 Department of Building Safety: Delete entire section.

Section R105.2 Work exempt from permit: Amend.

1. In paragraph 1 add the words "and is in compliance with the current Gunnison County Land Use Resolution".
2. Delete entire section referring to Electrical (1-5).

Of the items exempt from a building permit, #1 reads: "One-story detached accessory structures, provided that the floor area does not exceed 200 square feet."

Staff is proposing to add the words "and is in compliance with the current LUR". The reason for this is the LUR provides us with our setback distances from lot lines and waterbodies, among other development requirements. A customer would not need a building permit for a 200sf accessory structure but they do need to comply with the LUR. The definition of ***Accessory Structure is: A structure that is accessory to and incidental to that of the dwelling(s) and that is located on the same lot****. To be exempt from a building permit under this requirement, a residence has to already be established on the lot for this "accessory structure" to be incidental to. A customer could still place a 200sf structure on a parcel but they would need a building permit if the lot was otherwise vacant.*

This will be a change from the 2009 IRC adoption which limited exempt accessory structures to 120sf.

Section R105.5.1 Expired work: Add Section.

All below grade excavation done in advance of construction shall be filled and made safe within thirty (30) days of an abandoned project. Where construction has advanced beyond excavation all foundation work and above grade construction shall be secured against the weather and the construction site shall be otherwise returned to that condition as existed before the permit was issued.

Same as the 2009 IRC adoption.

Section R108.2 Schedule of permit fees: Replace entire paragraph with the following.

On buildings, structures, or alterations requiring a permit, a fee for each permit shall be paid as requested, in accordance with Appendix L Permit Fee (2015 International Residential Code).

R108.2.1: The Department of Regulatory Agencies, Colorado State Electrical Board and Colorado State Plumbing Board are responsible for electrical and plumbing fees, permits and inspections.

Same as the 2009 IRC adoption.

Section R108.3 Building permit valuations: The following paragraph shall be added.

In order to determine valuation for the various types of construction, building permit valuation shall be established according to the Building Valuation Data schedule as set forth in the most recent issue, at the time of the issuance of the building permit, of the Building Safety Journal, published by the International Code Council.

Same as the 2009 IRC adoption.

Section R108.4 Related fees: Add section:

A plan review fee shall be paid to cover the cost of review by Gunnison County Community Development Department. The plan review fee shall be 30% of the building permit fee. Additional plan review required by changes, additions or revisions to plans shall be charged a fee of $150.00 and review time beyond two hours shall be assessed at a rate of $100 per hour. If an independent plan review is required by the Building Official, the actual cost of such review along with administrative costs assessed at a rate of $75.00 per hour will be charged.

The above plan review fees were not part of the 2009 IRC adoption. They do reflect Resolution 15-8, passed by the BOCC on April 7, 2015.

Section R108.5 Refunds: Add the following refund policy:

The Building Official is authorized to refund building permit fees as follows.

3. The full amount of any fee paid hereunder which was erroneously paid or collected.
4. Not more than 80% of the building permit fee paid when no work has been done under a permit.

The Building Official is not authorized to refund any fee paid, except upon written application by the original permittee not later than 180 days after the date of fee payment.

Same as the 2009 IRC adoption.

Section R108.6 Work commencing before permit issuance: Replace entire paragraph with the following.

Any person who commences work before obtaining the necessary permits shall be subject to 100 percent (100%) of the usual permit fee in addition to the required permit fees.

Same as the 2009 IRC adoption.

Section R108.7 Re-inspection fees: Add section and paragraph.

A fee for re-inspection will be calculated at $75 per hour plus mileage to and from the site. Re-inspection fees will be due before the Certificate of Occupancy is issued.

Same as the 2009 IRC adoption but with an hourly rate increase from $42 as approved in Resolution 15-8.

Section R113.1 Unlawful acts: The following paragraph shall be added.

Before any building or structure may be moved into or within an unincorporated part of Gunnison County, a building permit shall be issued therefore in the same manner as for a new building or new construction. The cost for such a permit shall be based upon the Building Official's estimate of the probable cost involved and which will be necessary in order to make the building or structure comply with all the requirements for new buildings or structures in that area. In the event the owner shall not have taken steps necessary to make the building or structure comply with requirements of the Building Code within the period of time for which the permit was issued, then and in that event the building shall be removed from the premises at the expense of the owner and upon the order or demand of the Community Development Department. The Building Official may refuse to issue a permit to move, remove or repair any such building or structure which, in their opinion, cannot be brought into compliance with the Building Code and which, even repaired, will be structurally unsafe.

Same as the 2009 IRC adoption.

Section R301.1.1 Height limitations: Add section and the following paragraph.

The provisions of this building code notwithstanding, no building may exceed the height limitations set forth in the Gunnison County Land Use Resolution. Section 13-103 H: Allowed Structure Heights.

Table R301.2(1) Climatic and geographic design criteria: Amend to add the following values in the spaces provided.

Ground Snow Load: Varies. The value of roof (or other member) snow load shall be equal to the "recommended basic snow load" as defined in the "2016 Colorado Design Snow

Loads", prepared by the "Structural Engineers Association of Colorado". ASCE 7 procedures shall be used to convert to roof snow loads.

Wind Design:

Speed (mph):115 (ultimate design wind speed)
Topographic effects: no
Special wind region: no
Wind-borne debris zone: no

Seismic design category: B for site soil classification D

Subject to damage from:

Weathering: Severe
Frost line depth: 36 inches
Termite: none to slight

Winter Design Temp: -20F

Ice Barrier Underlayment Required: Yes

Flood Hazard: 1989, Resolution 89-31, 2011 FIRM maps

Air Freezing Index: 3447 (BF-days-100year)

Mean Annual Temp: 37.2F

Section R302.5.1 Opening protection: Add following sentence at end of paragraph. These doors shall be tight fitting to prevent exposure from potential garage carbon monoxide gases.

Same as the 2009 IRC adoption.

Section R313 Automatic Fire Sprinkler Systems:

Section R313.1 Townhouse automatic fire sprinkler systems of the 2015 IRC. Adoption of this section, without amendment, is recommended.

This sections will require that all new townhouses have residential fire sprinkler systems. This section was deleted in the last code adoption and thus adoption will be a code change for Gunnison County. Townhouse is defined as "a single-family dwelling unit constructed in a group of three or more attached units in which each unit extends from foundation to roof and with a yard or public way on not less than two sides."

Section R313.2 One- and two-family dwellings automatic fire sprinkler systems: Replace the first sentence with the following:

An automatic residential fire sprinkler system shall be installed in one-family dwellings when the Gross Floor Area exceeds 3,600 square feet.

An automatic residential fire sprinkler system shall be installed in two-family dwellings when the aggregate floor area exceeds 3,600 square feet. Garage area is not included in the calculation. A 2-hour fire resistance rated party wall, installed in accordance with Section 706 of the 2015 IBC, shall be acceptable to separate the dwellings units into separate one-family dwellings for purposes of this section.

Section N1102.4.1.2 (R402.4.1.2) Testing: Delete the first sentence and replace with the following:

The building or dwelling unit shall be tested.

Section N1102.4.1.2, as written in the 2015 IRC, requires that all new dwelling units are tested for air tightness and required to meet an air exchange rate of 3 changes per hour. Staff is proposing to amend the provision to not require that a specific air exchange rate be

met but to still require the testing. This is part of a larger section that describes the testing procedure and method.

Section G2406.2 Prohibited locations: Delete exceptions 3 and 4.
Section G2425.8 Appliances not required to be vented: Delete item number 7.
Section G2445 Unvented room heaters: Delete all paragraphs (Sections G2445.1-G2445.7) and add the following.

> Section G2445 Unvented room heaters prohibited: Unvented room heaters utilizing fuel combustion are prohibited in all locations throughout all occupancies.

All of the above Sections that begin with "G" refer to gas fueled unvented room heaters, which have not been allowed in Gunnison County. These are the same amendments as in the 2009 IRC.

Appendix F Radon Control Methods: Include the entire section.
Same as in the 2009 IRC adoption. As we are in a high radon area, passive control systems are installed during construction. After completion, the radon level is tested and, if high, the passive system can become active and bring radon levels down.

Appendix L Permit Fees: Include the entire section.
Same as in the 2009 IRC adoption.

ATTACHMENT C

AMENDMENTS TO 2015 INTERNATIONAL FUEL GAS CODE

Section 106.6.2 Fee schedule: Replace the entire section with the following.

A permit shall not be valid until all fees prescribed by the most current Gunnison County Community Development fee schedule are paid in full, nor shall an amendment to the permit be released until the additional fees, if any, have been paid.

Section 106.6.3 Fee refunds: Replace #2 with the following and delete #3.

2. Not more than 80 percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.

Section 109 Means of appeal: Replace the entire section with the following:

Section 109.1 Appeals shall be in accordance with 2015 IBC Section 113 as amended.

Section 303.3 Prohibited locations: Delete exception 3 and 4.

Section 501.8 Appliances not required to be vented: Delete item number 8 and 10.

Section 621 Unvented room heaters: Delete all paragraphs (section 621.1 through 621.7) and replace with the following:

Section 621 Unvented room heaters prohibited:

Unvented room heaters utilizing fuel combustion are prohibited in all location throughout all occupancies.

ATTACHMENT D

AMENDMENTS TO 2015 INTERNATIONAL MECHANICAL CODE

Section 106.5.2 Fee schedule: Replace the entire section with the following:

A permit shall not be valid until all fees prescribed by the most current Gunnison County Community Development fee schedule are paid in full, nor shall an amendment to the permit be released until the additional fees, if any, have been paid.

Section 106.5.3 Fee refunds: Replace #2 with the following and delete #3.

2. Not more than 80 percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.

Section 109 Means of appeal: Replace the entire section with the following:

Section 109.1 Appeals shall be in accordance with 2015 IBC Section 113 as amended.

Section 903.3 Unvented gas log heaters: Replace the entire paragraph with the following:

Unvented gas log heaters are prohibited in all location throughout all occupancies.

ATTACHMENT E
AMENDMENTS TO 2015 INTERNATIONAL ENERGY CONSERVATION CODE

Section C101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section C408.2 Mechanical systems and service water-heating systems commissioning and completion requirements, Exception 1: Replace paragraph with the following:

1. Mechanical systems and service water heater systems in buildings where the total mechanical equipment capacity is less than 600,000 Btu/h combined service water-heating or space-heating capacity or 480,000 Btu/h cooling capacity.

Section R101.1 Title: Replace [Name of Jurisdiction] with the following: Gunnison County

Section R202 General Definitions: Replace the definition of Residential Building with the following:

Residential Building. For this code, includes all residential structures that are not detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories above grade plan in height, and required to comply with the *International Residential Code*.