



# Land Use

Courthouse Annex • 2045 13th Street • Boulder, Colorado 80302 • Tel: 303.441.3930 • Fax: 303.441.4856  
Mailing Address: P.O. Box 471 • Boulder, Colorado 80306 • [www.bouldercounty.org](http://www.bouldercounty.org)

**BOULDER COUNTY BOARD OF REVIEW  
DOCKET #BORC-12-0001  
BOULDER COUNTY BUILDING CODE AMENDMENTS  
PUBLIC HEARING  
STAFF RECOMMENDATIONS  
September 4, 2012 - 4:00 p.m.  
Commissioners Hearing Room, Third Floor  
Boulder County Courthouse  
Boulder, Colorado**

**STAFF:** Gary Goodell, Chief Building Official

**RE: 2012 AMENDMENTS TO THE BOULDER COUNTY BUILDING CODE**

The Board of Review met on August 21<sup>st</sup> for a work session and public meeting to review and discuss the proposed updates and amendments to the Boulder County Building Code. Since that time, the staff has further developed and refined the amendments. The following is a summary of the code provisions that are proposed for adoption:

**THE INTERNATIONAL CODE COUNCIL & THE INTERNATIONAL CODES**

- The International Building Codes, including the International Building Code (“IBC”), International Residential Code (“IRC”) and other nationally recognized model codes dealing with building fuel gas, mechanical and plumbing systems, energy conservation and green building, are promulgated by the International Code Council (“ICC”). The ICC is composed of building officials, fire officials, design professionals, industry representatives, contractors, homebuilders and others involved in the design and construction of buildings.
- The International Codes are nationally recognized minimum safety standards governing the design and construction of buildings and structures.
- The ICC conducts an ongoing code development process. Changes to the codes may be proposed by anyone. Hearings are held on the proposed changes, and the changes are voted upon by national committee members and the ICC membership.

Major editions of the International Codes are published every three (3) years. The most current are the 2012 editions, which are being proposed for adoption and application in the unincorporated areas of Boulder County.

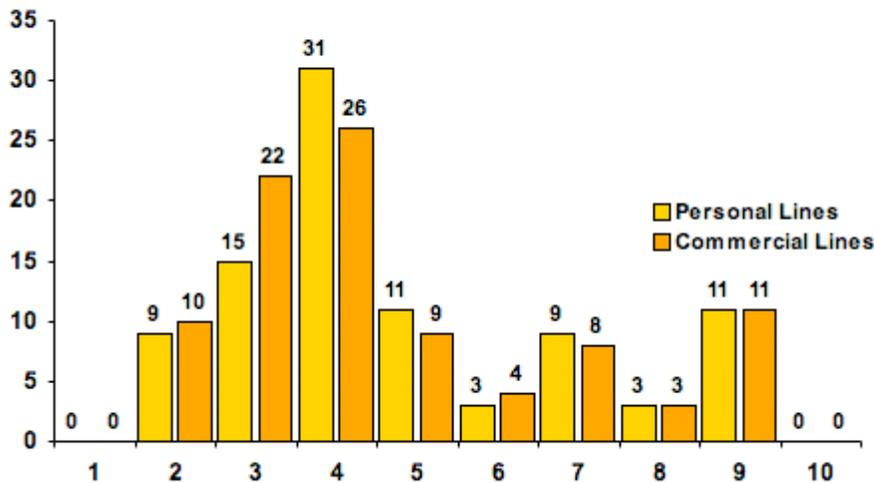
**THE ISO BCEGS PROGRAM**

- “ISO BCEGS” stands for the Insurance Services Organization Building Code Effective Grading Schedule.

- Much as it rates fire departments with an “ISO rating,” the ISO surveys and rates building departments all over the country with ratings from 1 – 10, with lower ratings being better.
- Insurance companies use the ISO ratings to assign insurance premium rates. Jurisdictions whose building departments earn lower ISO BCEGS ratings have lower insurance premium ratings for commercial and residential buildings. Discounts begin if a building department achieves a rating of 9 or lower.
- Adopting the latest editions of the nationally recognized model codes is a key component of a good ISO rating.
- Boulder County achieved an ISO BCEGS rating of “3” as a result of its last ISO survey. According to ISO records, there are only 9-10 jurisdictions in the state that have earned a higher rating of “2” and no jurisdictions with a rating of “1.”

**Colorado**

**Distribution of Communities by BCEGS Class**



The personal lines classification addresses building code adoption and enforcement for 1- and 2-family dwellings. The commercial lines classification is for all other buildings.

## **CODE CHANGE DEVELOPMENT AND REVIEW CRITERIA**

1. Is the code change **NECESSARY**? Is there really a problem with the existing code? Does the proposed change already exist in another section of the code or as part of a recently approved code change?
2. Is there **SUPPORTING DATA** or convincing evidence to illustrate or support the specific code change?
3. Is it **UNIFORM**? Can it be applied to any geographic area or is it needed only in a limited region? Is it generic in terms of any products to be used and thus not a proprietary code change?
4. Is it **FEASIBLE**? Can the requirement be constructed with existing or readily available methods and technology? If a product is involved, is that product readily available? Is any additional cost to the consumer commensurate with the benefit gained?
5. Is it a **PRACTICAL** solution to the problem? Does it do what the proponent intended? Will it increase the cost of enforcement?
6. Is it located in the right code chapter or section? Could it be more effective in a different **LOCATION**?
7. Is the proposed change **CONSISTENT** with other code provisions and other model codes? Does it require corresponding changes in other code sections or other codes?
8. Is the wording as **CLEAR** as it can be? Is it concise while still saying everything it needs to say? Does it avoid confusion and the potential for varying interpretations?
9. Is the **FORMAT** of the code change consistent with proper code organization and writing style?
10. Does the **'REASON'** portion of the submittal clearly and concisely explain the need for the change and the effect it will have on the code?

**FINALLY, WILL THE PROPOSED CODE CHANGE CLEARLY IMPROVE THE EXISTING CODE?**

### **THE CODES UPDATES, FROM THE ~~2009~~ TO THE 2012 EDITIONS**

- International Building Code (“IBC”)
- International Residential Code (“IRC”)
- International Energy Conservation Code (“IECC”)
- International Fuel Gas Code (“IFGC”) (ANSI Z223.1, the National Fuel Gas Code)
- International Mechanical Code (“IMC”)
- International Plumbing Code (“IPC”)

### **THE NATIONAL ELECTRICAL CODE (“NEC”)**

- The National Electrical Code is published by the National Fire Protection Association (“NFPA”) as NFPA 70.
- Adoption by the State Electrical Board pre-empts any local adoptions.
- The State Electrical Board has adopted the 2011 edition and it has been effective since July 1, 2011.

### **THE INTERNATIONAL GREEN CONSTRUCTION CODE (“IGCC”)**

- This is a new green construction code, developed jointly by ICC, the U.S. Green Building Council, IES, ASHRAE, ASTM and the American Institute of Architects. Boulder County previously adopted only portions of Public Version 2.0 of the code.
- The IGCC also permits the use of ASHRAE/USGBC/IES Standard 189.1-2009 as an alternate compliance method.
- The IGCC is proposed only for application to commercial buildings or complexes over 25,000 sq. ft. in total building floor area.
- The proposed adoption includes a number of jurisdictional options, which are included in the proposed Table 302.1.

### **THE INTERNATIONAL CODE COUNCIL PERFORMANCE CODE**

- This performance-based code is being proposed for adoption only as a guide and a tool for the evaluation of appeals for modifications and alternate materials, designs and methods of construction and equipment.

### **SUMMARY OF PROPOSED CHANGES ADMINISTRATIVE PROVISIONS**

- **Section 105.2 Work exempt from permit.** The list of items that are exempt from obtaining a building permit is changed to match current published code language for exempting only playground equipment accessory to one- and two-family dwellings and for exempting detached decks up to 200 sq. ft. and up to 30” above grade.
- **Section 107.1 Information on construction documents.** Three areas are amended to match published IBC or IRC language, including wall bracing (shear) information, manufacturer’s installation instructions and means of egress.
- **TABLE 1-A, FEES.** Changes to add an intermediate application deposit fee of \$100 for projects from \$25,001 - \$50,000 valuation and to increase the “TCO” fee from \$87 to \$150.
- **110.5.2.14 Insulation inspection.** Language is added to further clarify that the county will do insulation inspections for additions of 500 sq. ft. or less and that inspection by an energy rater is not required.
- **110.5.3.5 Gas piping.** Relocate the current 10 psi, 15-minute gas piping pressure test requirement, moving it to more appropriate locations in the IFGC and the IRC.

### **INTERNATIONAL BUILDING CODE CHAPTER 7**

#### **FIRE AND SMOKE PROTECTION FEATURES**

- **723.1 General.** Rather than duplicating identical provisions in Section 723 of the IBC and Section R325 of the IRC, Section 723.1 is revised to include only a reference to Section R325 and the remainder of Section 723 is deleted.

### **CHAPTER 15 ROOF ASSEMBLIES AND ROOFTOP STRUCTURES SECTION 1505 FIRE CLASSIFICATION**

- **TABLE 1505.1, footnote d.** Delete current references to Section 722, IBC, and replace with references to Section R325, IRC.

### **IBC CHAPTER 18**

**FOUNDATIONS AND RETAINING WALLS  
IBC SECTION 1805  
DAMP-PROOFING AND WATERPROOFING**

- **1805.5 Gutters and downspouts.** Add a 5<sup>th</sup> exception to the gutters and downspouts to permit an alternate means designed by a soils engineer or other qualified registered design professional.

**INTERNATIONAL RESIDENTIAL CODE  
CHAPTER 3  
BUILDING PLANNING**

- **IRC TABLE R301.2(1), CLIMATE AND GEOGRAPHIC DESIGN CRITERIA.** Add a summer design temperature of 90° F. and a “YES” for ice shield underlayment that is qualified by published code language about when and where “ice and water shield” is required.

**IRC SECTION R302  
FIRE-RESISTANT CONSTRUCTION**

- **R302.2 Townhouses, Exception.** Since the 2009 edition, the IRC has assumed that all townhouses are sprinklered, and it was necessary to amend the exception to note that a reduction from the normal 2-hour party wall to a 1-hour wall is permitted only if the townhouses are sprinklered. This is no longer necessary, as all new townhouses will be required to be sprinklered in accordance with the published code.

**IRC SECTION R303  
LIGHT, VENTILATION AND HEATING**

- **R303.8 Required heating, EXCEPTION:** Add a requirement to the existing exception allowing wood-burning appliances to be the primary source of heat requiring an approved means to keep pipes from freezing if dwelling is vacant.

**IRC SECTION R313  
AUTOMATIC FIRE SPRINKLER SYSTEMS**

- The 2009 IRC and the 2012 IRC as published include a requirement for the installation of automatic fire sprinkler systems in all new townhouses and all new one- and two-family dwellings.
- Boulder County has had an automatic fire sprinkler system requirement for new dwellings larger than 3,600 sq. ft. and additions resulting in more than 4,800 sq. ft. for over 17 years, since January 1, 1995.
- Colorado building and fire officials and others, totaling 54 individuals from all over Colorado, formed a Joint Ad-Hoc Residential Sprinkler Committee. Their report, dated September 25, 2009, and revised on November 17, 2009, contains a number of recommendations, including adopting the sprinkler requirements, but delaying the effective date until January 1, 2013.
- According to a 2012 survey, the Colorado jurisdictions that plan on adopting the 2009 or 2012 IRC, including the sprinkler provisions, include Centennial, Cherry Hills Village, the City & County of Denver, Edgewater, Federal Heights, Garfield County, Golden, Pitkin County, Thornton and Westminster, among others.
- Boulder County’s current adoption of the 2009 IRC includes the sprinkler requirements for all new townhouses and one- and two-family dwellings and the

January 1, 2013 effective date, and, in the interim, continues the existing requirements for fire sprinkler installations in new dwellings over 3,600 sq. ft. and existing dwellings with additions totaling more than 4,800 sq. ft.

- Two (2) of the county's 20+ fire protection districts have already adopted editions of the International Fire Code (IFC) that include a matching sprinkler requirement for all new dwellings. The county's Fire Code Review Committee and the Board of County Commissioners review all fire code adoptions, with one of the main review criteria being a lack of conflicts with the county's building codes.
- One of the criteria for ISO's ratings of both building departments and fire departments is the adoption of the latest nationally recognized model codes, and not adopting the latest codes can have a detrimental impact on the ISO ratings, which have an impact on insurance premium rates.
- The proposal includes existing provisions for sprinklering existing dwellings when additions or remodels/renovations total 4,800 sq. ft. or larger, but adds an exception for one-time additions of 200 sq. ft. or less. Staff has found that remodels/renovations of existing homes sometimes include "bump outs" of existing space(s) resulting in relatively minor additions to the existing square footage.
- The existing exception for not sprinklering if International Fire Code (IFC) hydrant fire flows are met is proposed to be deleted, as the published codes require both hydrant fire flow and sprinklering, although reductions in the required fire flow are allowed if buildings are sprinklered.
- **Fire department connection (FDC).** At least one of the fire districts has recommended that a fire department connection requirement be added. This allows the fire department to connect to the sprinkler system via a connection on the outside of the home and supply the sprinkler system with additional water. Since the requirement for an NFPA 13D sprinkler system is only 26 gallons per minute (gpm) for 10 minutes, or 260 gallons, this could fit with our "level of service" philosophy, allowing the sprinkler system to extinguish or contain a fire until the fire department has time to arrive and supplement the water supply from a fire truck, hydrant or other water supply.

## IRC SECTION R325

### IGNITION-RESISTANT MATERIALS AND CONSTRUCTION

- **R325.1.1 General.** Add language to clarify that the ignition-resistive requirements also apply to commercial and multiple-family buildings constructed under the IBC.
- **R325.2.3 Definitions.** Add an item 5 to the definition of "IGNITION-RESISTANT BUILDING MATERIAL" to include materials currently approved by the California Department of Forestry and Fire Protection, Office of the State Fire Marshal, in their "WUI Products Handbook."
- **R325.4.5 Deck walking surface.** Amend this section to permit the use of any composite decking material that has an ICC-ES evaluation report approval and an ASTM E84 flame-spread index no greater than 200.
- **R325.5.10, R325.6.10, R325.7.10 Defensible space.** Amend these sections for extreme, high and moderate hazard ratings to clarify that, for additions projects, both existing and new structures are to be provided with defensible space, that gravel or crushed rock around structures is to be at least 3/4-inch in diameter and that columns or posts are also to have gravel or rock extending 3 feet beyond them.

- **R325.7.3 Exterior walls.** Amend the moderate hazard exterior walls requirements to require the same ignition-resistant materials as are required for high hazard sites. Lessons learned from recent fires like the Fourmile Canyon Fire and the Waldo Canyon Fire show that homes are often lost even though green trees and other vegetation survive immediately around them. In the Fourmile Canyon Fire, 83% of the 168 homes destroyed were the result of surface fire, and not the more stereotypical image of a raging crown fire. Most homes are lost to low or moderate intensity fires from fire spotting or ember “blizzards” setting combustible materials on fire. The Fourmile Canyon Fire Findings discuss the concept of the Home Ignition Zone, or HIZ, extending for 100 feet around a home, and the increased likelihood that a home will survive if the HIZ includes only ignition-resistant materials.

There are basically three (3) things that we can count on:

1. There will be more fires in the wildland-urban interface, including extreme fire behavior.
2. There won't be nearly enough fire fighters or engines available to protect homes.
3. We can't guarantee (or regulate) the maintenance of defensible space by homeowners, whether it be trees, shrubs, grasses, storage of firewood, pine needles accumulating in gutters and valleys, or other features.

Our basic premise then is that, at the time of new construction, we should achieve the highest level of ignition-resistant construction that we're reasonably able to achieve and that this is one-near permanent feature that won't grow back or be greatly reduced in its effectiveness by a lack of maintenance or the passage of time.

### **IRC SECTION R327 ELECTRIC VEHICLE CHARGING PRE-WIRE OPTION**

- Patterned after the state law and existing amendment on solar pre-wiring (Section R326), this requires either a receptacle, wiring or conduit in new garages and carports to facilitate the charging of electric vehicles.
- to conform to state law. Requires wiring and/or plumbing to be installed in all new single-family dwellings to allow for future installation of photovoltaic or solar thermal systems.

### **IRC CHAPTER 11 ENERGY EFFICIENCY IRC SECTION N1101 GENERAL**

- **N1101.3 Identification and definitions.** Add the definition of HIGH-EFFICACY LAMPS from IRC Section N1101.9.
- **N1102.1.1 R-value computation.** Added wording to clarify insulation R-value computations.
- **N1102.2.9.2.2 Ventilated crawlspaces.** Add wording to clarify that naturally ventilated crawl spaces may not contain equipment, ducts or plumbing.
- **N1102.4 Air leakage, N1102.4.1 Building thermal envelope.** Add details on requirements for sealing two problem areas for air barriers.
- **N1103.2 Ducts.** Delete vague wording on ducts location.

- **N1103.2.2 Sealing.** Clarify test requirements for ducts and that duct testing is not required for existing duct systems that are being extended for additions.
- **N1103.5.1 Minimum required ventilation.** Clarify that requirements of this section and Table N1103.5.1 are for continuous ventilation and add an option for intermittent ventilation per IRC M1507.3.3 and Table M1507.3.3(2.).
- **N1104.1 High-efficacy lamps.** Clarify that minimum high-efficacy lamp requirements are for projects using the prescriptive path.
- **N1105.2.5.2 Calculation of energy usage for projects using the performance path option.** Delete exception because it is not necessary.
- **N1105.2.5.3.3 Performance path option requirements for remodels/renovations.** Revise HERS rating for this option from 80 to 75. This rating is relatively easy to achieve and other options are available.
- **N1105.2.5.3.4 Performance path option requirements for basement finishes.** Revise HERS rating for this option from 80 to 75. This rating is relatively easy to achieve and other options are available.
- **N1105.2.5.4 Prescriptive path option requirements, EXCEPTIONS 1, 2 and 3.** Revise exceptions for new dwellings and additions and add a new exception for remodels/renovations to require the Performance Bath at 5,000 sq. ft. of conditioned floor area instead of the current ~~6,000~~. This is also reflected in revisions to the tables at the back of Chapter 11. Currently, some very large houses can use the prescriptive path and achieve a HERS rating of only about 60.
- **N1105.2.5.4.7.1 Additions that result in an increase in conditioned floor area of 50% or more of the pre-existing dwelling and remodels/renovations where 50% or more of the existing finished wall membrane is removed.** Clarify that existing wall cavities must be filled with insulation, but exterior insulation is not required to be added unless siding is removed.
- **IRC TABLE N1102.1.** Revise to lower prescriptive Fenestration U-Factor from 0.35 to 0.30. The published 2012 IECC value is 0.32 and 0.30 windows are readily available.
- **IRC TABLE N1102.1.3.** Revise to lower existing Maximum Air Leakage rate from 5 Air Changes per Hour (ACH) at 50 Pascals to the 2012 IECC/IRC value of 3 ACH.
- **TABLE 1 – NEW CONSTRUCTION.** Revise Table 1 to adjust required HERS ratings lower, as follows:
  1. Change rating for homes 0 – 1,000 sq. ft. from 85 – 75.
  2. Change rating for homes 1,001 – 2,500 sq. ft. from 60 – 55.
  3. Change rating for homes 2,501 – 8,000 sq. ft. and above from a range of 60 – 10 to a range of 55 – 0.
- **TABLE 3 – PV Requirements for New Residences.** Revise to cut table off at the revised 5,000-sq.-ft. maximum for the Prescriptive Path.
- **TABLE 3 – PV Requirements for Additions.** Revise to cut table off at the revised 5,000-sq.-ft. maximum for the Prescriptive Path and to bring minimum system size to 1 kW. Both staff and contractors have noted that the existing requirements for a system as low as 0.2 kW don't make sense and don't have economy of scale or much of a payback for consumers.

**IRC CHAPTER 13  
GENERAL MECHANICAL SYSTEM REQUIREMENTS  
SECTION M1302**

## **APPROVAL**

- **M1302.2 Solid fuel burning equipment.** Add language to refer to state and federal lists of approved wood-burning appliances.

### **IRC CHAPTER 24 FUEL GAS SECTION G2417 INSPECTION, TESTING AND PURGING**

- **G2417.1 Test pressure, G2417.4.2 Test duration.** Relocate current gas pipe test requirements for 10 psi for 15 minutes to appropriate location in code.

### **IRC CHAPTER 26 PLUMBING SECTION P2601 GENERAL**

- **P2601.2, EXCEPTION.** Delete the existing exception regarding garage floor drains, as it conflicts with state and local public health department requirements.

### **IRC CHAPTER 29 WATER SUPPLY AND DISTRIBUTION**

- **P2903.10 Hose bibb, P2903.10.1 Yard hydrants.** Delete this existing amendment, as the same requirements are contained in IRC Section P2903.9.5.

### **IRC CHAPTER 30 SANITARY DRAINAGE SECTION P3009 GRAY WATER RECYCLING SYSTEMS**

- Amend this section to reflect the limitations of Colorado water law and the regulations of the Colorado Division of Water Resources. These requirements were previously located in Appendix O of the IRC, but have been moved to Section P3009 in the 2012 edition.

### **SECTION P3010 RAINWATER RECYCLING SYSTEMS**

- Add a new Section P3010, "Rainwater Recycling Systems," with provisions identical to those currently found in Appendix O of the IRC amendments.

### **2012 INTERNATIONAL MECHANICAL CODE IMC CHAPTER 9 SPECIFIC APPLIANCES, FIREPLACES AND SOLID FUEL-BURNING EQUIPMENT**

- **901.5 Solid fuel burning equipment.** Add language to refer to state and federal lists of approved wood-burning appliances.

### **2012 INTERNATIONAL PLUMBING CODE IPC CHAPTER 6 WATER SUPPLY AND DISTRIBUTION**

**SECTION 608  
PROTECTION OF POTABLE WATER SUPPLY**

- **608.1.1 Yard hydrants.** Delete this amendment, as the requirements are contained in Section 608 of the Plumbing Code.

**2012 INTERNATIONAL FUEL GAS CODE  
IFGC CHAPTER 4  
GAS PIPING INSTALLATIONS  
SECTION 406  
INSPECTION, TESTING AND PURGING**

- **406.4.1 Test pressure, 406.4.2 Test duration.** Note that these gas piping test requirements (10 psi and 15 minutes) 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.

**2012 INTERNATIONAL ENERGY CONSERVATION CODE**

- **IECC TABLE 402.1.1.** Revise our amended table to upgrade Fenestration *U*-Factor from current 0.35 to 0.30 and change Maximum Air Leakage rate from current 5 ACH to 2012 IECC/IRC rate of 3 ACH.

**2012 INTERNATIONAL GREEN CONSTRUCTION CODE  
CHAPTER 1  
SCOPE AND ADMINISTRATION  
SECTION 101  
GENERAL**

- **101.3 Scope.** Amend scope to include only buildings or complexes of buildings on the same property with over 25,000 square feet of total floor area.
- **Table 302.1, REQUIREMENTS DETERMINED BY THE JURISDICTION.** Fill in table to require various jurisdictional elective items and a zEPI (Zero Energy Performance Index) of 46, which is about 10% more energy-efficient than the 2012 IECC.

**PUBLIC MEETING AND HEARING SCHEDULE**

- All meetings (except September 11) are to be held in the County Commissioners Hearing Room on the 3<sup>rd</sup> Floor of the Main Courthouse in downtown Boulder.
- **Tuesday, August 14, 2012 - 4:30 – 6:30 P.M.:** Public Meeting for Input/Feedback on Proposed Code Amendments.
- **Tuesday, August 21, 2012 - 4:00 – 6:00 P.M.:** Board of Review Public Meeting and Work Session.
- **Tuesday, September 4, – 4:00 – 6:00 P.M.:** Board of Review Public Hearing.
- **Tuesday, September 11, – 12:00 – 2:00 P.M.:** Presentation to Colorado Green Building Guild (CGBG) Brown Bag Luncheon, REI Community Room, 1789 28th St., Boulder, CO 80305.
- **Thursday, September 27, 2012, 1:30 P.M.:** Board of County Commissioners Public Hearing, Resolution 2012-50.

### **PROPOSED CODES EFFECTIVE DATE**

- **January 1, 2013:** The updated codes are proposed to be effective for all building permit applications received on or after this date for construction in the unincorporated portions of Boulder County.

### **STAFF RECOMMENDATION:**

Staff recommends that the Board of Review recommend to the Board of County Commissioners APPROVAL of Docket #BOR-12-0001, 2012 Amendments to the Boulder County Building Code, and that the Board of County Commissioners ADOPTS the proposed BOCC Resolution #2012-50.

GRG:grg