



City of Columbia

701 East Broadway, Columbia, Missouri 65201

Department Source: Community Development - BSD

To: City Council

From: City Manager & Staff

Council Meeting Date: April 18, 2016

Re: Adoption of the 2015 International Code Council Family of Codes, with Amendments

Executive Summary

The Building Construction Codes Commission (BCCC) has completed its review of the 2015 International Code Council family of codes and the 2014 National Electrical Code for adoption by the City. While the majority of the code changes in this cycle consist of clarifications and reformatting, there are several major code changes including required storm shelters for educational (K through 12 schools) and critical emergency operations use groups (911 call stations, fire, rescue, ambulance, and police stations), as well as new commercial and residential energy efficiency requirements. The Environment and Energy Commission (EEC) also has provided recommendations on the energy efficiency requirements in the International Residential Code (IRC) and the International Building Code (IBC).

Discussion

The Building Construction Codes Commission is authorized by Chapter 6 of the City Code to "review the Building and other codes periodically for updating and recommending changes." After obtaining authorization to review the 2015 codes from the City Council in March 2015, the BCCC and its committees met frequently from May 2015 to January 2016, evaluating the effect of the new codes and recommending local amendments. BCCC members, representatives of the Building and Site Development Division of the Community Development Department, the Fire Department, and the Inspections Division of Boone County Resource Management attended the meetings.

The Environment and Energy Commission (EEC), following its charge in Chapter 2 of the City Code to "Act in an advisory capacity to the council in all matters pertaining to environmental protection, which could include questions of energy efficiency and conservation, and of changing technology," has reviewed the BCCC recommendations. The EEC has provided several recommended amendments to the energy efficiency requirements for single and two family construction and commercial structures, including multiple-family and institutional residential structures. A summary of the EEC recommendations is provided at the end of this discussion and in the attachments.

Below is a list of selected major code changes and other proposed amendments. All amendments appear in bold font/strikethrough in the attached proposed ordinances.



Significant Code Changes

1. **Storm shelters.** The most significant change of this code cycle is the new storm shelter requirement (ICC 500) in the 2015 International Building Code (IBC). Because Central Missouri is in an area where the design wind speed for tornadoes is 250 mph [See attached Figure 304.2(1)] the 2015 IBC section 423 requires storm shelters to be constructed in accordance with ICC 500 for the following use groups;

423.3 Critical emergency operations. 911 call stations, emergency operations centers and fire, rescue, ambulance and police stations.

Exception: Buildings meeting the requirements for shelter design in ICC 500.

423.4 Group E occupancies. All group E occupancies with an occ. load of 50 or more.

Exceptions:

1. Group E daycare facilities.
2. Group E occupancies accessory to places of religious worship.
3. Buildings meeting the requirements for shelter design in ICC 500.

None of the existing buildings in the City would meet the requirements for shelter design in ICC 500 if they were built today.

The 2015 IBC is not clear how building additions may trigger the requirement for a storm shelter. According to an ICC representative, the authority having jurisdiction would determine the requirement for constructing a storm shelter for an addition on a case by case basis. An administrative policy would likely need to be established to clarify the issue.

There will be many additional structural, engineering, and procedural requirements for shelters designed in compliance with ICC 500. Because of the additional expense related to these requirements, the BCCC members want to make sure all stakeholders are aware of this major code change. The BCCC proposes no amendments to these new provisions.

2. **Energy efficiency.** As in the last code cycle the BCCC reviewed new energy code requirements and considered both the benefits of the new requirements and the associated expenses. The BCCC recommends adopting the 2015 Energy Code requirements with the following amendments.

Commercial

- a. The 2015 International Energy Efficiency Code **Section C408** requires **System Commissioning**. All members agreed system commissioning, adjusting, and balancing is advisable. It is the opinion of the committee that the additional required plans and documentation are both cumbersome, time consuming, and expensive. Consensus was that system balancing, performance, and control can be achieved without these additional burdens and suggest the following amendments.



C408.2 Mechanical systems and service hot water heating systems commissioning and completion requirements. Amend as follows;

Prior to the final mechanical and plumbing inspections, the registered design professional or approved agency ~~shall~~ **should** provide evidence of mechanical system commissioning and completion in accordance with the provisions of this section.

C408.3.1 Functional testing. Amend as follows.

Prior to passing final inspection, the registered design professional ~~shall~~ **should** provide evidence that the lighting control systems have been tested to ensure that control hardware and software are calibrated, adjusted, programmed and in proper working condition in accordance with the construction documents and manufacturer's instructions.

- b. As in the last code cycle the BCCC voted to keep the amendment to IBC 1301.1.2 for R-2, R-3, and R-4 use groups (attached). This amendment prescribes insulation values, thermal envelope sealing, and thermal transmittance values for windows.

Residential One and Two Family

- a. **N1101.3 Scope.** Add the attached figure labeled 2015 Residential Energy Code Requirements and make it a prescriptive means of code compliance. The committee believes building to this diagram both meets the intent of the code and simplifies the requirements for builders and inspection staff. Consensus was that simplification would translate to more consistent compliance, energy efficiency and affordability.
- b. **N1102.2.9 Basement walls. Amend first sentence as follows;** Walls associated with ~~conditioned~~ **finished** basements shall be insulated from the top of the basement wall down...
This is applicable only to the foundation wall portions of unfinished basements. To insulate these walls before it is determined what the use will be and where plumbing, mechanical, and electrical components will be located leads to excess cost and duplication of work. This amendment is in line with the goal of affordability.
- c. **N1102.4.1.2 Testing. Amend as follows (Amended portion in bold font);** The building or dwelling unit shall be blower door tested **as deemed necessary by the building official** and verified as having an air leakage rate...Because dwellings never fail the blower door test when constructed per the prescriptive code requirements the blower door test is unnecessary. When, through un-craftsman-like work, compliance with prescriptive code requirements is questionable, the blower door test may be



required. Because blower door testing is several hundred dollars this amendment is in line with the goal of affordability.

- d. **N1102.4.4 Rooms containing fuel burning appliances. Delete.** This section requires rooms “where open combustion air ducts provide combustion air to open combustion fuel-burning appliances” (Typically 80% efficiency gas furnaces and water heaters) to be isolated from the building thermal envelope by means of insulation and fully gasketed doors. The committee believes this requirement, in conjunction with the requirement to bring combustion air into the room, may cause unintended negative consequences such as **freezing** of water pipes or builders using less efficient electric equipment. The committee also believes isolating this room from the thermal envelope entails unnecessary expense.
- e. **Appendix U (Appendix RB in the International Energy Conservation Code) Solar Ready Provisions.** This appendix is not mandatory unless adopted by the adopting ordinance. The BCCC believes the provisions of this appendix will only add unnecessary construction documentation requirements and does not propose adoption of this appendix.

- 3. **Accessibility.** The BCCC is proposing two accessibility amendments to IBC chapter 11 as follows;

1104.4 Multistory buildings and facilities. Amend exception 1 as follows (Amended portion in bold font);

Exceptions:

- 1. An accessible route is not required **in private buildings or facilities that are less than three stories or** to stories and mezzanines that have an aggregate area of not more than 3,000 square feet and are located above and below accessible levels. This exception shall not apply to:
 - 1.1 Multiple tenant facilities of group M occupancies containing five or more tenant spaces used for sales and rental of goods and where at least one such tenant space is located on a floor level above or below the accessible levels;
 - 1.2 Stories or mezzanines containing offices of health care providers (Group B or I);
 - 1.3 Passenger transportation facilities and airports (Group A-3 or B) or;
 - 1.4 Government Buildings.

This language intends to conform with the ADA which states;

Exceptions:

- 1. In private buildings or facilities that are less than three stories or that have less than 3000 square feet per story, an accessible route shall not be required to connect



City of Columbia

701 East Broadway, Columbia, Missouri 65201

stories provided that the building or facility is not a shopping center, a shopping mall, the professional office of a health care provider, a terminal, depot or other station used for specified public transportation, an airport passenger terminal, or other type of facility as determined by the Attorney General.

1109.5.1 Minimum number (Drinking fountains). Amend as follows; ~~No fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.~~

As the code is written a minimum of two drinking fountains is always required because the maximum height for wheelchair accessibility is 34" and the minimum for standing persons is 36" the BCCC. The BCCC voted that if the plumbing code only required one drinking fountain it could meet the standard for wheelchair accessibility. The intent was to limit cost. Note: **Staff has some concerns regarding this amendment; a member of Great Plains ADA Center has stated the proposed amendment is in direct conflict with ADA requirements.**

4. **Existing structures.** Chapter 34 **Existing Structures** has been removed from the IBC. The provisions of this chapter are now contained in the International Existing Building Code (IEBC). IBC section 101.4.7 states, "The provisions of the International Existing Building Code shall apply to matters governing the repair, alteration, change of occupancy, addition, to and relocation of existing buildings." The IEBC goes into much greater detail and clarification than Chapter 34 provided without changing the intent of the provisions.
5. Also of note are;
 - A. The BCCC recommendation to adopt appendices R and S in the 2015 International Residential Code. These appendices establish requirements for "Light Straw-Clay Construction" and "Strawbale Construction".
 - B. The BCCC recommendation to add a commission member "Experienced in Energy Conservation". (IBC amendment section 113.1.2)

EEC Recommendations

The Environment and Energy Commission has made a number of recommendations regarding energy efficiency that differ from the BCCC recommendations, which are summarized below and in the attachments to this report.

The EEC recommendations would make the following changes to the draft ordinance:



City of Columbia

701 East Broadway, Columbia, Missouri 65201

1. Revise the proposed 2015 Residential Energy Code Requirements diagram to require mandatory air leakage testing, state a target air leakage rate, and require blower door and duct pressure tests; require termite barriers.
2. Revise Table 301.2(1) to rate Missouri as “moderate to heavy” termite risk rather than “very heavy” risk as recommended by the BCCC (moderate to heavy is the rating given to Missouri in the published code);
3. Amend the International Residential Code N1102.4.1.2 to require blower door (air leakage) testing (currently it is not recommended a requirement by BCCC);
4. Amend IBC 1301.1.2 to change required insulation values for use groups R-2, R-3, and R-4 (housing other than 1 or 2 family) from R38 to R49 for ceiling or roof and R15 to R20 for exterior walls; require slab insulation rated R10 and require a termite barrier in accordance with R318.3j; and change window “U” value (thermal transmittance rating) from 0.55 to 0.40.
5. Adopt Appendix U, Solar Ready Provisions, as part of the International Residential Code.

Fiscal Impact

Short-Term Impact: None

Long-Term Impact: None

Vision & Strategic Plan Impact

Vision Impacts:

Primary Impact: Environment, Secondary Impact: Health, Social Services & Affordable Housing, Tertiary Impact: Not Applicable

Strategic Plan Impacts:

Primary Impact: Not Applicable, Secondary Impact: Not Applicable, Tertiary Impact: Not Applicable

Comprehensive Plan Impacts:

Primary Impact: Livable & Sustainable Communities, Secondary Impact: Not applicable, Tertiary Impact: Not Applicable



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Legislative History

Date	Action
03/02/15	REP33-15 Council authorized the Building Construction Codes Commission to review the 2015 International Codes.
07/20/15	R 120-15 Council directed the City Clerk to place on file for a period of ninety days the 2015 International code Council family of codes and the 2014 National Electric Code.

Suggested Council Action

Adopt the 2015 International Code Council family of Codes (International Residential Code, International Building Code, International Energy Conservation Code, International Existing Buildings Code, International Plumbing, Mechanical, and Fuel Gas Codes, International Fire Code) and the 2014 National Electric Code to be in full force and effect on October 1, 2016.

Introduced by _____

First Reading _____

Second Reading _____

Ordinance No. _____

Council Bill No. B 109-16

AN ORDINANCE

repealing Article IX of Chapter 6 of the City Code relating to the 2012 Edition of the International Fuel Gas Code, and enacting in lieu thereof a new Article IX adopting the 2015 Edition of the International Fuel Gas Code; and fixing the time when this ordinance shall become effective.

BE IT ORDAINED BY THE COUNCIL OF THE CITY OF COLUMBIA, MISSOURI, AS FOLLOWS:

SECTION 1. Article IX of Chapter 6 of the Code of Ordinances, City of Columbia, Missouri, relating to the 2012 Edition of the International Fuel Gas Code, is hereby repealed and in lieu thereof a new Article IX, relating to the 2015 Edition of the International Fuel Gas Code, is hereby enacted reading in words and figures as follows:

CHAPTER 6. BUILDINGS AND BUILDING REGULATIONS

...

ARTICLE IX. FUEL GAS CODE

Sec. 6-230. Adopted.

The 2015 Edition of the International Fuel Gas Code, published by the International Code Council, Inc., including Appendices A, B and C, one copy of which has been on file with the city clerk for a period of ninety (90) days prior to the adoption of this article, is hereby adopted by reference and made a part of the Code of Ordinances, City of Columbia, Missouri as fully as if set forth in its entirety. At least one (1) copy of the 2015 Edition of the International Fuel Gas Code shall remain on file in the office of the city clerk and shall be kept available for public use, inspection and examination.

Sec. 6-231. - Amendments.

The code adopted by this article is hereby amended by substituting the following sections in lieu of those sections with corresponding numbers in the code, or, where there is no corresponding section in the code, the following sections shall be enacted as additions to the code:

101.1 Title. These regulations shall be known as the Fuel Gas Code of the City of Columbia, Missouri, hereinafter referred to as "this code."

101.3.1 Appendices A, B, and C are hereby adopted as published.

101.6 Unlawful. It shall be unlawful for any person to engage in the installation, alteration or repair of any gas piping systems, fuel gas utilization equipment, gaseous hydrogen systems and related accessories, appliances or components in or on any building, structure or premises within the corporate limits of the City of Columbia, Missouri, unless issued a certificate of competency by the board of mechanical examiners or the board of plumbing examiners.

SECTION 103 DIVISION OF BUILDING AND SITE DEVELOPMENT

103.1 Director. The administration and enforcement of this ordinance shall be the duty of the director of community development , who is designated the code official for purposes of this code. The code official is hereby authorized to take such action as may be reasonably necessary to enforce the provisions of this code. Such persons may be appointed and authorized as assistants or representatives of the director as may be necessary to carry out the provisions of this code.

103.2 Appointment. Delete.

103.3 Deputies. Delete.

103.4 Liability. Any officer or employee charged with the enforcement of this code, while acting on behalf of the city, shall not thereby render such individual liable personally, and is hereby relieved from all personal liability for any damage accruing to persons or property as a result of any act performed in the discharge of official duties. Any suit instituted against any officer or employee because of an act performed by that officer or employee in the lawful discharge of duties and under the provisions of this code shall be defended by the legal representative of the jurisdiction until the final termination of the proceedings. The officer or employee shall not be liable for costs in any action, suit or proceeding that is instituted pursuant to the provisions of this code; and any officer or employee acting within the scope of employment and in good faith and without malice, shall be free from liability for acts performed under any of its provisions or by reason of any act or omission in the performance of official duties in connection therewith. Nothing contained herein shall be deemed a waiver of the immunities and protection afforded to the city or officers and employees pursuant to state and federal law.

103.5 Restrictions of employees. An employee connected with the division of building and site development shall not be engaged in, or directly or indirectly connected with the furnishing of labor, materials or appliances for the construction, alteration or maintenance of a building, or the preparation of construction documents thereof, unless that person is the owner of the building; nor shall such employee engage in any work that conflicts with official duties or with the interests of the division.

106.1.1 Permit required. Application for a permit shall be made by a licensed master mechanical HVACR mechanic, or a licensed master plumber, except as provided in section 106.2. Fuel gas permits may be issued to the general contractor on behalf of the master plumber or master mechanic for new one and two family dwellings and building alteration or building additions for one and two family dwellings. All fuel gas work must be performed by a plumber, or mechanic licensed by the City of Columbia, or as allowed by ordinance. Any permit required by this code may be issued to any person to do any work regulated by this code in a single-family dwelling used exclusively for living purposes, including the usual accessory buildings and quarters in connection with such buildings, provided the person is a bona fide owner of such dwelling and that the dwelling will be occupied by the owner, and that the owner shall personally purchase all material and perform all labor in connection therewith. Any person obtaining a permit under this section shall not be issued another permit within two years.

106.5.2 Fee schedule. The fees for all mechanical and fuel gas work shall be as indicated in the following schedule:

\$0.00 to \$1,000.00	\$35.00
\$1,000.01 to \$5,000.00	\$25.00 plus \$6.25 per thousand over \$1,000.00
\$5,000.01 to \$10,000.00	\$50.00 plus \$5.00 per thousand over \$5,000.00
\$10,000.01 to \$20,000.00	\$75.00 plus \$3.75 per thousand over \$10,000.00
Over \$20,000.00	\$112.50 plus \$2.50 per thousand over \$20,000.00

106.6.3 Fee refunds. The code official shall authorize the refunding of fees as follows:

1. The full amount of any fee paid hereunder which was erroneously paid or collected.
2. Not more than seventy-five (75) percent of the permit fee paid when no work has been done under a permit issued in accordance with this code.
3. Delete in its entirety.

The code official shall not authorize the refunding of any fee paid, except upon written application filed by the original permittee not later than one hundred eighty days (180) days after the date of fee payment.

108.4 Violation penalties. Any person who shall violate a provision of this code or shall fail to comply with any of the requirements thereof shall be guilty of a misdemeanor and upon conviction thereof shall be punished by a fine of not more than one thousand dollars (\$1,000.00) or by imprisonment not exceeding one (1) year, or by both such fine and imprisonment. Each day that a violation continues shall be deemed a separate offense.

108.5 Stop work orders. Upon notice from the code official that work is being done contrary to the provisions of this code or in a dangerous or unsafe manner, such work shall

immediately cease. Such notice shall be in writing and shall be given to the owner of the property, or to the owner's agent, or to the person doing the work. The notice shall state the conditions under which work is authorized to resume. Where an emergency exists, the code official shall not be required to give a written notice prior to stopping the work. Any person who shall continue any work on the system after having been served with a stop work order, except such work as that person is directed to perform to remove a violation or unsafe condition, shall be liable to a fine of not less than one hundred dollars (\$100.00) or more than one thousand dollars (\$1,000.00).

109.1 Appeals. The owner of a building or structure or any person directly affected by a decision of the code official may appeal to the building construction codes commission from a decision of the official refusing to grant modifications of the provisions of this code covering the manner of installation, or materials to be used in the installation. The procedure for appeal shall be governed by Section 113.0 of the Building Code of Columbia, Missouri.

109.2 through 109.7 – Delete.

403.5.2 Copper and brass tubing. Copper tubing shall comply with standard Type K of ASTM B 88 or ASTM B 280.

Copper pipe and copper tubing shall not be allowed for fuel gas piping systems.

404.14 Piping underground beneath buildings. Add last sentence to paragraph which states: Any underground gas piping allowed by this section shall only be approved for gas that is less dense than the atmospheric pressure and shall be installed in accordance with section 404.12.1 and shall always terminate or vent to the outside.

404.14.2 Delete in its entirety.

406.4 Test pressure measurement. Replace the last sentence as follows: Mechanical gauges used to measure test pressures shall have a range such that the highest end of the scale is not greater than 100 psi.

406.4.1 Test pressure. The test pressure to be used shall be not less than one and one-half (1½) times the proposed maximum working, but not less than 30 psig, irrespective of design pressure.

408.4 Sediment trap. In the second sentence, change "any length" to "3½-inch minimum length".

Secs. 6-232—6-234. Reserved.

SECTION 2. The repeal of Article IX of Chapter 6 of the Code of Ordinances, City of Columbia, Missouri, relating to the 2012 Edition of the International Fuel Gas Code shall

not affect any offense or act committed or done or any penalty or forfeiture incurred before the effective date of this ordinance.

SECTION 3. This ordinance shall be in full force and effect from and after October 1, 2016.

PASSED this _____ day of _____, 2016.

ATTEST:

City Clerk

Mayor and Presiding Officer

APPROVED AS TO FORM:

City Counselor