ARC 1301C

PUBLIC SAFETY DEPARTMENT[661]

Adopted and Filed

Pursuant to the authority of Iowa Code sections 103A.7, 103A.11 and 103A.14, the Building Code Commissioner in the Department of Public Safety and the Building Code Advisory Council hereby amends Chapter 301, "State Building Code—General Provisions," and Chapter 303, "State Building Code—Requirements for Energy Conservation in Construction," Iowa Administrative Code.

The Building Code Commissioner in the Department of Public Safety is authorized to adopt administrative rules, and the Building Code Advisory Council is authorized to approve or disapprove the administrative rules, according to Iowa Code sections 103A.7, 103A.11, and 103A.14. These amendments implement the policy of adopting the energy code provisions that are closely connected to the mechanical code adopted in Iowa. Plumbing and mechanical codes are required to comply with the most current code cycle, pursuant to Iowa Code section 105.4 as amended by 2013 Iowa Acts, Senate File 427, effective April 26, 2013. The most recent editions of the codes used in the construction industry reflect current industry standards, and adoption of the current codes helps to promote consistency in the regulations affecting the construction industry.

The Department proposed to adopt the 2012 energy code because the energy code and mechanical code are closely related, and newly enacted statutory provisions require the adoption of the most recent edition of the mechanical code. In addition, federal regulations mandate substantial compliance (by 2017) with certain standards set in the 2009 International Energy Conservation Code (IECC). That level of compliance would require changes in current standard practices in the industry, although business trends are making compliance easier and more affordable. Adoption of the 2012 energy code will establish progress toward compliance, which may make federal funding options available to Iowans, and promote economic development. The out-of-pocket expense for purchase of the energy code is a fraction of the cost of the entire family of 2012 building codes.

Notice of Intended Action was published in the Iowa Administrative Bulletin as **ARC 1198C** on November 27, 2013, and a public hearing was held on January 7, 2014.

Prior to publication of the Notice, informal meetings were held with stakeholders in the construction industry. Those stakeholders reached consensus in support of the adoption of the most recent edition of the International Building Code, including the adoption of the 2012 energy code.

An informal working group of stakeholders was also convened to discuss plans to achieve compliance in the most effective way. The working group met several times from March 2013 to May 2013 to focus on the practical implications of adoption of amendments to the state energy code. The informal working group included representatives from multiple stakeholders, including the Iowa Home Builders Association; local building code officials; Iowa Finance Authority; Iowa Economic Development Authority; Alliant Energy; Cedar Falls Utilities; American Institute of Architects (AIA); American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE); Leadership in Energy & Environmental Design (LEED); Home Energy Rating System (HERS); residential and commercial contractors, including Hubbell Construction, Bell Brothers and Jerry's Homes; American Chemistry Association; and American Plywood Association. The working group also benefited from assistance from the Midwest Energy Efficiency Alliance (MEEA), which assists many Midwestern states with energy code issues, because MEEA representatives were familiar with the amendments adopted in the surrounding states of Minnesota, Illinois and Nebraska.

Based on the recommendations of the working group, the rule making is designed to adopt the commercial IECC with no amendments and to adopt the residential IECC with five amendments. The amendments are consistent with recent 2012 IECC adoptions in Minnesota and Illinois.

Written comments were provided by several associations before the public hearing. Written comments in support of the proposed amendments were provided by the Midwest Energy Efficiency Alliance, the American Chemistry Council, the Responsible Energy Codes Alliance, and the Alliance to Save Energy. No comments in opposition were submitted before the public hearing. In addition

to written comments, representatives of these organizations and other individuals attended the public hearing and provided comments.

Representatives of the Midwest Energy Efficiency Alliance noted that the recommendations of the stakeholder group were adopted in large part, but noted one area in which the recommendations were not incorporated. The rules regarding duct tightness and duct leakage, appearing in Rule 403.2.2, set standards that would be difficult for the industry to meet in the short term without adding expense, estimated to range in the thousands of dollars per residential project, to new residential building projects. The stakeholder group had concluded that an increase in the standards was appropriate but not at the levels set in the 2012 International Energy Efficiency Code. The suggested amendment to the Notice of Intended Action would make the rules consistent with the standards recommended by the stakeholder group.

One individual attending the public hearing objected to the suggested amendment and recommended instead that a significantly higher standard be set. The other attendees at the public hearing felt that the higher standard would be unworkable now, but that notification to the industry of the need to comply with higher standards with the adoption of the next edition of the International Energy Efficiency Code would be workable. The primary concern expressed by those who favored the suggested amendment was that setting an unworkable standard now would reduce compliance with the Code generally. Iowa has experienced a high rate of compliance in comparison with other states, and also has had success in notifying the industry of expected changes in the standards. A gradual change is more likely to support higher levels of compliance.

Attendees also noted that the transition period refers to projects commenced between January 1, 2014, and March 31, 2014. Given the rule-making process, the transition period is too short, and should be extended to May 31, 2014, in order to provide sufficient notice to the industry.

The Adopted and Filed amendments differ from those published under Notice of Intended Action in that the adopted amendments set standards for the sealing of ducts in residential buildings. The energy code considers safety, comfort, indoor air quality and energy efficiency. Most heating and cooling is accomplished via duct systems throughout the home. The sealing of ducts can reduce leakage and increase energy efficiency and can have an incidental impact on comfort and indoor air quality. The stakeholder group concluded that current industry standards in Iowa have progressed toward the 2017 energy goals but that adoption of the standards set out in the 2012 energy code could add thousands of dollars to building costs for each home. The amended standard set out in the Adopted and Filed amendments requires higher standards than those in place now but should not result in dramatic cost increases. The amended standard also allows time to notify the building industry that additional changes will be required by 2015.

Rules regarding the building code are subject to the waiver provisions of rule 661—10.222(17A). The Commissioner and the Board do not have authority to waive requirements established by statute, according to Iowa Code section 103A.7.

The Building Code Commissioner in the Department of Public Safety and the Building Code Advisory Council adopted these amendments on January 7, 2014.

The economic impact of the adoption of the energy code should be positive. United States Census data show that Iowa suffered less and has recovered faster than its neighboring states during the latest recessionary period. Similarly, Associated General Contractor data also show that Iowa's economic recovery has occurred faster than the national average. In fact, construction employment in Iowa rose 7 percent from 2008 to 2012, in comparison to the national average of just 1.3 percent, and Iowa ranked fourth out of 51 jurisdictions in its construction employment numbers. Given Iowa's economic edge in recovering from the recessionary period in 2008 to 2010, it is not surprising to see that measures of both residential and nonresidential construction are stronger in Iowa in comparison to its neighbors.

Iowa's strong recovery means that construction in the state is likely to continue to be strong. Eligibility for federal funding programs can provide additional incentives to build in Iowa, and use of energy-efficient construction also can support financing of construction and reduce the long-term costs for the buildings constructed. This investment in infrastructure can have long-term benefits for businesses, workers and homeowners.

After analysis and review of this rule making, there should be a positive impact on jobs. Increased opportunity for building in Iowa, including access to federal funding to support the projects, is likely to increase jobs in the construction industry. It also supports other economic growth opportunities because new construction supports and enhances other economic development. The Board will continue to work with stakeholders to maximize this rule making's positive impact on jobs.

These amendments are intended to implement Iowa Code sections 103A.7, 103A.8, and 103A.8A.

These amendments will become effective March 12, 2014.

The following amendments are adopted.

ITEM 1. Rescind rule 661—301.10(103A) and adopt the following **new** rule in lieu thereof:

661—301.10(103A) Transition period. A construction project which is subject to the provisions of any rule in 661—Chapter 301 or 661—Chapter 303 which requires compliance with provisions of the 2009 edition of any code published by the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, may comply with the requirements established either in the edition of the code adopted herein or the requirements established in the edition of the same code previously in effect if the project is commenced between January 1, 2014, and May 31, 2014.

ITEM 2. Amend rule 661—303.1(103A) as follows:

661—303.1(103A) Scope and applicability of energy conservation requirements.

303.1(1) *Scope.* Rules 661—303.1(103A) through 661—303.3(103A) establish thermal energy efficiency standards for the design of new buildings and structures or portions thereof, additions to existing buildings, and renovation and remodeling of existing buildings, except for residential buildings of one or two dwelling units, which are intended for human occupancy and which are heated or cooled by regulating their exterior envelopes and selection of their heating, ventilation, and air-conditioning systems, service water heating systems and equipment for the efficient use of energy, and lighting efficiency standards for buildings intended for human occupancy which are lighted.

303.1(2) *Applicability.* Rules 661—303.1(103A) through 661—303.3(103A) apply to design and construction of buildings which are intended for human occupancy throughout the state of Iowa. Any construction of buildings or facilities which are intended for human occupancy and which are heated or cooled is covered, with the exception of renovation and remodeling of residential buildings of one or two dwelling units, which are not covered. Rule 661—303.2(103A) establishes standards for design and construction of residential buildings of three or fewer stories. Rule 661—303.3(103A) establishes standards for design and construction of commercial buildings and residential buildings of four or more stories. The occupancy of any building covered by this chapter shall be determined based upon the occupancy definitions in chapter 3 of the International Building Code, ~~2006~~ 2012 edition.

303.1(3) No change.

ITEM 3. Amend rule 661—303.2(103A) as follows:

661—303.2(103A) Residential energy code. The International Energy Conservation Code – Residential Provisions, ~~2009~~ 2012 edition, published by the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, is adopted by reference as the residential energy code of the state of Iowa building code, applicable to residential construction limited to three or fewer stories throughout the state of Iowa, with the following amendments:

~~Delete section 101.1.~~
~~Delete section 101.2.~~
~~Delete section 103.3.1.~~
~~Delete section 103.3.2.~~
~~Delete section 103.3.3.~~
~~Delete section 103.4.~~
~~Delete section 103.5.~~
~~Delete sections 104, 107, 108, and 109 and all sections contained within each of these.~~

~~Delete chapter 5.~~

Delete section R101.1.

Delete section R101.2 and insert in lieu thereof the following new section:

R101.2 Scope. This code applies to residential buildings and the building sites and associated systems and equipment as defined pursuant to 661—subrule 303.1(2). The remodeling or renovation of one- and two-family dwelling units is not within the scope of this code.

Delete section R103.3.1.

Delete section R103.3.2.

Delete section R103.3.3.

Delete section R104.1 and insert in lieu thereof the following new section:

R104.1 General. Construction or other work that is required to be inspected by state law or local ordinance shall be in accordance with sections R104.2 through R104.8. The state fire marshal shall have authority to perform audits to ensure compliance with the requirements of this code. When local governments conduct compliance audits, the information may be provided to the Department of Energy or to the state fire marshal in a timely way. Local governments may contract with the state fire marshal to conduct audits.

Delete sections R108 and R109 and all sections contained therein.

Delete section R402.1.1 and insert in lieu thereof the following new section:

R402.1.1 Insulation and fenestration criteria. The building thermal envelope shall meet the requirements of Table R402.1.1 based on the climate zone specified in chapter 3.

Table R402.1.1

Table R402.1.1 Insulation and Fenestration Requirements by Component[a]

Climate Zone	Fenestration U-Factor[b]	Skylight U-Factor[b]	Glazed Fenestration SHGC[b,e]	Ceiling R-Value	Wood Frame Wall R-Value	Mass Wall R-Value[i]	Floor R-Value	Basement Wall R-Value[c]	Slab R-Value & Depth[d]	Crawl Space[c] Wall R-Value
1	NR	.75	.25	30	13	3/4	13	0	0	0
2	.40	.65	.25	38	13	4/6	13	0	0	0
3	.35	.55	.25	38	20 or 13+5[h]	8/13	19	5/13[f]	0	5/13
4	.35	.55	.40	49	20 or 13+5[h]	8/13	19	10/13	10, 2ft	10/13
5	.32	.55	NR	49	20 or 13+5[h]	13/17	30[g]	15/19	10, 2ft	15/19
6	.32	.55	NR	49	20 or 13+5[h]	15/20	30[g]	15/19	10, 4ft	15/19
7 & 8	.32	.55	NR	49	20+5 or 13+10[h]	19/21	38[g]	15/19	10, 4ft	15/19

[a] R-values are minimums. U-factors and SHGC are maximums. When insulation is installed in a cavity which is less than the label or design thickness of the insulation, the installed R-value of the insulation shall not be less than the R-value specified in the table.

[b] The fenestration U-factor column excludes skylights. The SHGC column applies to all glazed fenestration. EXCEPTION: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed .30.

[c] "15/19" means R-15 continuous insulation on the interior or exterior of the home or R-19 cavity insulation at the interior of the basement wall. "15/19" shall be permitted to be met with R-13 cavity insulation on the interior of the basement wall plus R-5 continuous insulation on the interior or exterior of the home. "10/13" means R-10 continuous insulation on the interior or exterior of the home or R-13 cavity insulation at the interior of the basement wall.

[d] R-5 shall be added to the required slab edge R-values for heated slabs. Insulation depth shall be the depth of the footing or 2 feet, whichever is less in Climate Zones 1 through 3 for heated slabs.

[e] There are no SHGC requirements in the Marine Zone.

[f] Basement wall insulation is not required in warm-humid locations as defined by Figure R301.1 and Table R301.1.

[g] Or insulation sufficient to fill the framing cavity, R-19 minimum.

[h] First value is cavity insulation; second value is continuous insulation or insulated siding. Therefore, "13+5" means R-13 cavity insulation plus R-5 continuous insulation or insulated siding. If structural sheathing covers 40 percent or less of the exterior, continuous insulation R-value shall be permitted to be reduced by no more than R-3 in the locations where structural sheathing is used – to maintain a consistent total sheathing thickness.

[i] The second R-value applies when more than half the insulation is on the interior of the mass wall.

Delete section R402.4.1.2 and insert in lieu thereof the following new section:

R402.4.1.2 Testing. The building or dwelling unit shall be tested and verified as having an air leakage rate not exceeding 5 air changes per hour in Climate Zones 1 and 2, and 4 air changes per hour in Climate Zones 3 through 8. Testing shall be conducted with a blower door 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; and
6. Supply and return registers, if installed at the time of the test, shall be fully open.

Delete section R403.2.2 and insert in lieu thereof the following new section:

R403.2.2 Sealing (mandatory). Ducts, air handlers, and filter boxes shall be sealed. Joints and seams shall comply with either the International Mechanical Code or International Residential Code, as applicable.

EXCEPTIONS:

1. Air-impermeable spray foam products shall be permitted to be applied without additional joint seals.
2. Where a duct connection is made that is partially inaccessible, three screws or rivets shall be equally spaced on the exposed portion of the joint so as to prevent a hinge effect.
3. Continuously welded and locking-type longitudinal joints and seams in ducts operating at static pressures less than 2 inches of water column (500 Pa) pressure classification shall not require additional closure systems.

Duct tightness shall be verified by either of the following:

1. Postconstruction test: Leakage to outdoors shall be less than or equal to 4 cfm (113.3 L/min) per 100 square feet (9.29 m^2) of conditioned floor area or total leakage shall be less than or equal to 6 cfm (170 L/min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the entire system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (170 L/min) per 100 square feet (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the system, including the manufacturer's air handler enclosure. All registers shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 3 cfm (85 L/min) per 100 square feet (9.29 m^2) of conditioned floor area.

Testing shall be conducted by an approved third party. A written report of the results shall be signed by the party conducting the test and provided to the code official.

EXCEPTION: The duct leakage test is not required for ducts and air handlers located entirely within the building thermal envelope unless cavities are used for returns.

Delete section R403.2.3 and insert in lieu thereof the following new section:

R403.2.3 Building cavities (mandatory). Building framing cavities shall not be used as supply ducts. Building framing cavities may be used as return ducts if both of the following conditions exist:

1. Ducts must be tested for duct leakage in accordance with section R403.2.2.
2. Exterior wall cavities shall not be used for return ducts.

ITEM 4. Amend rule 661—303.3(103A) as follows:

661—303.3(103A) Adoption of nonresidential energy code. The International Energy Conservation Code – Commercial Provisions, ~~2009~~ 2012 edition, published by the International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041, is hereby adopted by reference as the nonresidential energy code of the state building code, applicable to commercial construction or residential construction of four or more stories within the state of Iowa, with the following amendments:

~~Delete section 101.1.~~
~~Delete section 101.2.~~
~~Delete section 103.3.1.~~
~~Delete section 103.3.2.~~
~~Delete section 103.3.3.~~
~~Delete section 103.4.~~
~~Delete section 103.5.~~
~~Delete sections 104, 107, 108, and 109 and all sections contained within each of these.~~
~~Delete chapter 4.~~

Delete section C101.1.

Delete section C101.2 and insert in lieu thereof the following new section:

C101.2 Scope. This code applies to commercial buildings and the buildings' sites and associated systems and equipment as defined pursuant to 661—subrule 303.1(2).

Delete section C103.3.1.

Delete section C104.1 and insert in lieu thereof the following new section:

C104.1 General. Construction or other work that is required to be inspected by state law or local ordinance shall be in accordance with sections C104.2 through C104.8.

Delete sections C108 and C109 and all sections contained therein.

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EDITOR'S NOTE: For replacement pages for IAC, see IAC Supplement 2/5/14.