

FACT SHEET

ENERGY CODE COMPLIANCE

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The 2015 International Energy Conservation Code (IECC)—the code that serves as the model for states' codes—has undergone final changes.

Some major changes include: revisions to the provisions for existing buildings, elimination of the code's blanket exemption of historic buildings, revisions to the building envelope and duct leakage testing requirements, new and revised requirements for hot water distribution efficiency, and a new Energy Rating Index (ERI) compliance path, which adds a performance path for compliance such as the widely-used HERS Index.

Energy Efficient Residential Construction

What to expect under the 2015 International Energy Conservation Code

Building Officials descended upon Atlantic City, New Jersey in October to attend the International Code Council's (ICC) Public Comment Hearings and decide the final version of the 2015 International Energy Conservation Code (IECC). The IECC is updated every three years and serves as the national model energy code, which becomes mandatory when adopted by a state or local jurisdiction.

After two grueling days of hearings, the residential provisions of the IECC were decided. A few of the more significant changes included: revisions to the provisions for existing buildings, changes to how the code treats historic buildings, revisions to the air barrier and insulation installation table, new requirements for combustion closets, revisions to the building envelope and duct leakage testing requirements, new and revised requirements for hot water distribution efficiency, a new requirement for drain water heat recovery, a new Energy Rating Index compliance path, and two new appendices.

I will provide an overview of these changes and some of the smaller changes that may still impact construction.

Changes to Chapter 1, Scope and Administration

The first significant changes to Chapter 1 include the deletion of the sections for 'existing buildings', 'historic buildings' and 'additions, alterations, renovations and repairs'. All of these sections were deleted in favor of moving the provisions to a new section or chapter. Since there was more than one proposal that impacted these provisions, it will be up to ICC to correlate the proposals. The 2015 IECC will either include a new section within Chapter 4 or an entirely new chapter, (I'll discuss these changes in more detail later).

The next significant changes to Chapter 1 come in section 104 'inspections'-- Section 104 has been revised to list and describe the required inspections as: 'footing and foundation inspection', 'framing and rough-in inspection', 'plumbing rough-in inspection' and 'mechanical rough-in inspection'.

Changes to Chapter 2, Definitions

The following definitions have been added or revised for the 2015 IECC:

- Continuous Insulation (ci)
- ERI Reference Design
- Fenestration
- Historic Building
- Insulated Siding
- Skylight
- Vertical Fenestration

Changes to Chapter 3, General Requirements

A new section 301.4 'Tropical climate zone' was added to define what regions of the world constitute a tropical climate, (an additional section in Chapter 4 will include some "deemed to comply" requirements for tropical climate zones). There was also a new section added for 'insulated siding' which lists ASTM C1363 as the test standard to determine the thermal resistance (R-value) of insulated siding. There were also a few minor changes to the climate zone map that won't be discussed here.

Changes to Chapter 4, Residential Energy Efficiency

Building Envelope Provisions

There were many small changes that clarified code provisions in chapter 4, but the first change that could impact construction is a new exception to

section R402.2.4 'Access hatches and doors'. The exception allows vertical doors that provide access from conditioned to unconditioned spaces to meet the fenestration requirements (i.e., U-value) in Table R402.1.1. This change means that these types of doors, such as attic kneewall doors, do not have to be insulated the same way as the surrounding wall, as long as they meet the U-value requirements in the table.

Another new exception to section R402.2.7 allows for the floor framing cavity insulation to not be in contact with the underside of the subfloor decking, as long as it is in contact with the top side of sheathing or continuous insulation installed on the bottom side of floor framing; and the all the perimeter band joists are insulated to the wood frame wall requirements.

The next change in chapter 4 adds a new section R402.2.13 to address 'Walls with partial structural sheathing'. Where continuous insulation is required by Table R402.1.1 and structural sheathing covers 40 percent or less of the total exterior wall area, the R-value of the continuous insulation may be reduced by an amount not to exceed R-3 in order to maintain a consistent sheathing thickness.

Section R402.3.2 'Glazed fenestration SHGC' has been revised to recognize dynamic glazing. The change allows dynamic glazing to satisfy the SHGC requirements of Table R402.1.1 where the ratio of the higher- to-lower labeled SHGC is greater than or equal to 2.4, or where both the upper and lower labeled SHGC already comply with the requirements of the table.

A significant revision was made to Table 402.4.1.1 'Air Barrier and Insulation Installation', splitting the 'criteria' column

Section R402.3.2
'Glazed fenestration SHGC' has been revised to recognize dynamic glazing. The change allows dynamic glazing to satisfy the SHGC requirements of Table R402.1.1

into separate 'air barrier' and 'insulation installation' criteria. Additionally new criteria for 'concealed sprinklers' was added along with revised criteria for 'walls', 'floors' and 'fireplaces'.

Testing for building envelope air leakage as required under section 402.4.1.2 was also revised to require that all testing be done in accordance with ASTM E 779 or ASTM E 1827. Finally, the last change to the building envelope provisions of chapter 4 revised the requirements for fireplaces to require that tight-fitting doors on factory-built fireplaces (listed in accordance with UL 127 or UL 907 for masonry) also be listed and labeled for the fireplace.

Mechanical Systems

One significant change to the mechanical provisions is a new requirement for a combustion closet. The change applies to climate zones 3 through 8 and requires that "where open combustion air ducts provide combustion air to open combustion, space conditioning fuel burning appliances, the appliances and combustion air openings shall be located outside of the building thermal envelope, or enclosed in a room isolated from inside the thermal envelope." Where a room is used to isolate the appliances from the conditioned space, the room must be sealed and insulated in accordance with the below-grade wall R-value requirement in Table R402.1.1.

Two exceptions to this section include: (1) direct vent appliances with both intake and exhaust pipes installed continuous to the outside and (2) fireplaces and stoves complying with the IECC and section R1006 of the International Residential Code.

There is also a change to the duct insulation provisions. The new language clarifies that both supply and return ducts in attics must be insulated to a minimum of R-8, where 3 inch or greater in diameter and R-6 where less than 3 inch diameter. Supply and return ducts located elsewhere in the building must be insulated to a minimum of R-6, where 3 inch or greater in diameter and R-4.2 where less than 3 inch diameter.

A few changes to the duct testing and duct leakage provisions include switching the order of the testing options so that 'rough-in test' is listed before 'post-construction test' and the allowance to measure leakage to outdoors or a total leakage test.

There were also changes to the provisions for service hot water systems. One change prohibits both gravity and thermo-syphon circulation systems while another requires recirculation systems to be demand-controlled. The requirement for hot water pipe insulation is still R-3, but the provisions have been simplified and the 'maximum run length' table has been deleted.

A change to section R403.6, 'Equipment sizing' adds a new sentence stating: "New or replacement heating and cooling equipment shall have an efficiency rating equal to or greater than the minimum required by federal law for the geographic location where the equipment is installed."

There were no changes to Section R404, 'Electrical Power and Lighting Systems'.

Performance Path Changes

Although there were some changes to Section R405, 'Simulated Performance Alternative', many builders consider this performance path to be unusable, so I won't discuss those changes here. A new performance path compliance option was approved and will become Section R406, 'Energy

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Rating Index Compliance Alternative'. This new performance path option is based on an energy rating index (ERI). RESNET's Home Energy Rating System (HERS) is one of the most common systems that use an ERI. Aside from meeting an ERI score between 51 and 55, this path also requires some minimum mandatory requirements as well as building envelope levels at least as stringent as the 2009 IECC. There is also a requirement that verification of compliance be completed by an approved third party. This new ERI compliance path represents the most significant change coming to the 2015 IECC.

Changes Coming for Work on Existing Buildings

As I mentioned above, the 'existing buildings', 'historic buildings', and 'additions, alterations, renovations and repairs' sections are being deleted from Chapter 1. However, these requirements are not disappearing from the code; they are being moved to a new chapter (or a new section, depending on how ICC correlates several related code proposals). For the purposes of this document I'm going to assume the new requirements will be moved to a new chapter, which would be Chapter 5. This new chapter will handle all requirements related to existing buildings.

When it comes to work on historic buildings, not only have provisions been moved from Chapter 1 to Chapter 5, but there is also a definition added to Chapter 2 and the new provisions in Chapter 5 have been made more stringent. Historic buildings are no longer exempt from the IECC.

Instead alterations and repairs to historic buildings must comply with the IECC to the extent that such compliance does not compromise the historic nature and function of the building. Where compliance would compromise the historic nature or function of the building a report must be submitted to the code official from the owner, a registered design professional or representative of the historic preservation authority having jurisdiction.

The rest of Chapter 5 is broken down into separate sections for additions, alterations and repairs. The exceptions that used to be covered in Chapter 1 are now located within the appropriate section in the new chapter. There were also some changes approved to the exceptions, which includes one for the roofing exception and one to allow window film to be applied to existing single pane windows. One of the most significant changes to the additions and alterations sections is adding additional clarity related to the application of the code.

For example, under the 'Alterations' provisions, there is a separate section that specifies what requirements in Chapter 4 apply for alterations related to the building envelope. The same is true for replacement fenestration, heating and cooling systems, service hot water systems and lighting.

Ultimately this new Chapter should provide greater clarity on how the IECC applies to projects involving historic buildings as well as additions, alterations and repairs to existing buildings.

And last, but not least...

For the first time the IECC will have an appendix. Two new appendices were approved in Atlantic City. The first involves recommended procedures for worst-case testing of atmospheric venting systems and the second solar-ready provisions for detached one- and two-family dwellings. An appendix is not mandatory unless an adopting entity makes it such.

After analyzing all the changes that were approved for the 2015 IECC, you will notice that the actual impact to energy efficiency is minor. The most significant changes to the new IECC residential provisions will be the addition of a new Energy Rating Index compliance path and a new chapter to address existing buildings.

Publication of the 2015 IECC is expected in the Spring of 2014. Visit www.iccsafe.org for more info.