In an article in last month’s RCI Interface, I reviewed the changes to the International Building Code (IBC) for the 2018 edition, representing a year’s work by the International Code Council (ICC) members. This article will review some of the more contentious code proposals, and their results, to the International Energy Conservation Code (IECC). Approved proposals will be used to create the 2018 edition of the IECC. Below are a few of the proposals that were highly contentious. At the final action hearings, most of the proposals were approved; however, the online voting determines the final disposition of a proposal. As you can see by these results, a number of proposals were surprisingly switched from approved to disapproved.

NEW CLIMATE ZONE MAP

The American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) submitted a proposal to modify the climate maps in accordance with ASHRAE 169-2013, Climate Data for Building Design Standards, which now includes a Climate Zone 0. The new climate zone includes warmer areas of the world. Cities included in Climate Zone 0 are Mumbai, Abu Dhabi, and Jakarta. There are no areas of the United States or Canada that are included in Climate Zone 0. There are some changes within the United States, with climate zones shifting northward, representing a warming trend. See Figure 1.

Result: Disapproved. The proposal was approved at the hearings, but disapproved by the online voting. This will result in differences between the ASHRAE standards and those of the IECC.

CERTIFICATE OF COMPLIANCE REQUIRED FOR SPRAYED POLYURETHANE FOAM (SPF)

A proposal was submitted by the National Roofing Contractors Association (NRCA) to add a definition of “Certificate of Compliance” for sprayed polyurethane foam (SPF) insulation. The definition reads, “A certificate stating that materials and products meet specified standards or that work was done in compliance with approved construction documents.” The certificate would state the installed thickness of the areas covered and their R-value. For insulated siding, the R-value would be labeled on the product’s package and listed on the certification. The insulation installer would sign, date, and post the certification in a conspicuous location on the job site.

Result: Disapproved.

OUTCOME-BASED COMPLIANCE

The National Institute of Building Sciences (NIBS) submitted a proposal outlining requirements for outcome-based compliance. Outcome-based compliance is determined by measuring the energy being used by the building and the energy use of elements of the building site. The proposal includes a table of different types of occupancy and the associated energy target by climate zone. The actual energy usage is determined by metering, utility billing, or other forms of measurement acceptable to the code official. Prior to plan approval, designs must demonstrate that they have the ability to meet the energy usage targets through energy modeling. At the conclusion of the project, a temporary certificate of occupancy is issued. Within 24 months of issuance of the temporary certificate of occupancy, the owner must submit evidence to the code official that the building has complied with target energy usage continuously for 12 months, and the report must be certified by a registered design professional.

Result: Disapproved.

TAPERED INSULATION

Another proposal submitted by NRCA involved rewriting Section C402.2.2, Roof Assemblies. In the 2015 edition of the IECC, this section of the code contained three exceptions to the requirement that minimum R-values must be those specified in Table C402.1.3, Opaque Thermal Envelope Insulation Component Minimum Requirements, R-Value Method. The first exception allows for calculating the insulation value of continuous insulation where the insulation thickness varies less than 1 inch and the area-weighted U-factor is equivalent to the same assembly with the R-values in Table C402.1.3.

The NRCA’s reason statement argued that this exception is not required because the U-factor method is referenced in the scoping section, which states: “The opaque portions of the building thermal envelope shall comply with the specific insulation requirements of Section C402.2 and the thermal requirements of either the U-value-based method of Section C402.1.3; the U-, C- and F-factor-based method of Section C402.1.4; or the component performance alternative of Section C402.1.5.”

RCI opposed this change, citing that this exception is referencing continuous insulation and not tapered insulation. There may be designs that call for different thicknesses at different locations on the building. The
area-weighted U-factor value gives designers the ability to calculate the overall insulation value of the roof to demonstrate compliance. While the scoping in Section C 402.2.2 does refer to the U-factor method, it does not refer to the area-weighted area calculation. A search of the energy code does not reveal any reference to area-weighted average except for fenestrations.

Without the exception for area-weighted average to find the U-value, it would appear that all parts of the roof must meet the minimum U-values in the table, no longer allowing lesser U-values in some areas of the roof and greater-than-minimum U-values in some areas, providing an area-weighted average equal to the U-values required in the table, and resulting in more conservative roof designs.

The language in Exception 2, which defined how R-values are determined for tapered insulation, has been rewritten to clarify how the R-value is calculated. For tapered insulation that is entirely above the roof deck and varies more than 1 inch, the R-value is determined where the insulation thickness is one inch greater than the minimum thickness of the tapered insulation.

RCI was successful in having the proposal denied at the Committee Action Hearings in March, but the committee decision was overturned at the Public Comment Hearings. The final outcome is based on the online voting results, which concluded on November 27, 2016.

**Result: Disapproved.** This item was disapproved at the committee action hearings, approved at the final action hearings, and disapproved by the online voting.

**AIR LEAKAGE REQUIREMENTS**

The Department of Energy submitted a proposal to modify the air leakage requirements of the code. The proposal adds a table specifying that buildings over a certain size must be tested for air leakage to determine compliance with the continuous air barrier requirements of the code. The requirement for air leakage testing of certain buildings is based on climate zone, building use, and the floor area of the conditioned space, and can be found in Table 402.5.1.2, Minimum Building Size Requiring Air Leakage Testing. For example, a building in Climate Zone 4B with an R (residential) or I (institutional) occupancy, with an area of 60,000 square feet or more, must be air-leakage tested.

**Result: Disapproved.**
AIR BARRIER COMMISSIONING

There were a number of proposals that dealt with air barrier commissioning, including one that would stipulate commissioning of the air barriers in buildings that require them. A registered design professional would have to provide proof to the code official. A design and field inspection checklist indicating the requirements for maintaining the air barrier would be necessary. Field inspections during construction showing compliance with the air barrier requirements, as well as proper storage and handling, use of approved materials, material and surface preparation, and air barrier continuity of the air barrier at penetrations would be documented.

Final commissioning reports would be provided to the building owner and, if requested, to the code official.

**Result:** Disapproved. This item was approved at the final action hearings and subsequently disapproved by the online voting.

REROOFING REQUIREMENTS FOR EXISTING BUILDINGS

The NRCA submitted a proposal to add an exception to the section on reroofing. The exception states that where the required R-value cannot be provided because of limitations due to existing rooftop conditions, HVAC equipment, parapet heights, low doors, or glazing heights, the maximum insulation thickness compatible with the available space should be installed, when approved by the code official.

**Result:** Disapproved. This item was disapproved at the committee action hearings, approved at the final action hearings, and disapproved by the online voting.

AIR BARRIERS: SINGLE-PLY VS. SELF-ADHERED MEMBRANE

NRCA and ASHRAE each submitted proposals to modify the language of the deemed-to-comply list of materials for air barriers in the IECC. The list of materials that are deemed to comply includes self-adhered single-ply membranes. The initial proposal was by NRCA to ASHRAE to change “self-adhered single-ply membrane” to “single-ply membrane” in ASHRAE 90.1, Energy Standard for Buildings Except Low-Rise Residential Buildings.

Opponents were successful in arguing that a single-ply membrane will only be an air barrier when it is self-adhered, because a mechanically fastened membrane will allow air to intrude into the space below the membrane and can create moisture issues. Another air barrier should be installed with mechanically fastened membranes to prevent air and moisture from moving through the roof assembly.

Proponents argued that the list is a list of materials, that single-ply membranes can meet the testing requirements of ASTM E2178, and for consistency with the ASHRAE 90.1 standard. The consequence of this change would be to allow mechanically fastened single-ply membranes to meet the requirements of air barriers, making them exempt from the requirement for air leakage testing of the building. This proposal was disapproved by the Structural Committee at the committee action hearings, but was overturned at the final action hearings, and disapproved by online voting.

**Result:** Disapproved. This item was disapproved at the committee action hearings, approved at the final action hearings, and disapproved during online voting.

INTERNATIONAL GREEN CODE

Historically, the third year of the code cycle has been devoted to hearings for the International Green Code (IGC). ICC and ASHRAE, the publisher of ASHRAE 189.1, Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings, have signed a memorandum of understanding (MOU) to use the 189.1 standard for the technical provisions of the IGC, so there will be no code hearings in 2017. The code hearings will resume in 2018 with the Group A hearings.

Please note that the results of the hearings have not been verified and are considered preliminary results. The results go through a verification process before final publication of the changes, but it would be unusual if the approvals/disapprovals changed as a result of that process.

REFERENCES


Wanda Edwards is the senior director of technical services for RCI. Before joining RCI, she served as director of code development for the Insurance Institute for Business and Home Safety. Prior to that, she was a deputy commissioner and chief engineer for the engineering division of the North Carolina Department of Insurance, whose responsibilities included administration and regulation of the building codes. Edwards earned bachelor’s degrees in civil engineering and architecture from North Carolina State University. She is a licensed professional engineer and serves on various committees within ASTM, ICC, and NIBS.

CORRECTION

An article by Wanda Edwards appearing in the January 2017 issue of RCI Interface on the results of the Final Action Code Hearings for the International Code Council reported that a proposal submitted by the Single Ply Roofing Institute (SPRI) concerning ballasted roofs was approved. The proposal would revise Table 1504.8 to specify the gradation of the stone as per ASTM D1863 and ASTM D7655 and modify parapet requirements. By grading the stone and reviewing wind tunnel testing performed with aggregate roofs, the requirements of the table would be relaxed by allowing larger-stone aggregate to be acceptable in higher wind speed areas than currently allowed. The proposal was approved at the final hearing; however, it was subsequently disapproved during the online voting process.