

# RE188 – 13

## R202 (NEW) (IRC N1101.9 (NEW)), R401.2 (IRC N1101.15), R406 (NEW) (IRC N1106 NEW)

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**Revise as follows:**

**R401.2 (N1101.15) Compliance.** Projects shall comply with Sections identified as “mandatory” and with either sections identified as “prescriptive”, ~~or the performance approach in Section R405-~~ or an Energy Rating Index (ERI) approach in Section R406.

### **SECTION R406 (N1106)** **ENERGY RATING INDEX COMPLIANCE ALTERNATIVE**

**R406.1 (N1106.1) Scope.** This section establishes criteria for compliance using an Energy Rating Index analysis.

**R406.2 (N1106.2) Mandatory requirements.** Compliance with this section requires that the mandatory provisions identified in Section R401.2 and R403.4.2 be met. The building thermal envelope shall be greater than or equal to levels of efficiency and Solar Heat Gain Coefficient in Table 402.1.1 or 402.1.3 of the 2009 *International Energy Conservation Code*.

**Exception:** Supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6.

**R406.3 (N1106.3) Energy rating index.** The energy rating index (ERI) shall be a numerical integer value that is based on a linear scale constructed such that the *ERI reference design* has an Index value of 100 and a residential building that uses no net purchased energy has an Index value of 0. Each integer value on the scale shall represent a one percent (1%) change in the total energy use of the *rated design* relative to the total energy use of the *ERI reference design*. The ERI shall consider all energy used in the residential building.

**R406.3.1 (N1106.3.1) ERI reference design.** The *ERI reference design* shall be configured such that it meets the minimum requirements of the 2006 *International Energy Conservation Code* prescriptive requirements

The proposed residential building shall be shown to have an annual total normalized Modified Loads that are less than or equal to the annual total Loads of the *ERI reference design*.

**R406.4 (N1106.4) ERI based compliance.** Compliance based on an ERI analysis requires that the *rated design* be shown to have an ERI less than or equal to the appropriate value listed in Table R406.3, when compared to the *ERI reference design*.

**TABLE R406.4 (N1106.4)**  
**MAXIMUM ENERGY RATING INDEX**

<u>Climate Zone</u>	<u>Energy Rating Index</u>
<u>1</u>	<u>52</u>
<u>2</u>	<u>52</u>
<u>3</u>	<u>51</u>
<u>4</u>	<u>54</u>
<u>5</u>	<u>55</u>

<u>6</u>	<u>54</u>
<u>7</u>	<u>53</u>
<u>8</u>	<u>53</u>

**R406.5 (N1106.5) Verification by approved agency.** Verification of compliance with Section R406 shall be completed by an approved third party.

**R406.6 (N1106.6) Documentation.** Documentation of the software used to determine the energy rating index and the parameters for the residential building shall be in accordance with Sections R406.6.1 through R406.6.3.

**R406.6.1 (N1106.6.1) Compliance software tools.** Documentation verifying that the methods and accuracy of the compliance software tools conform to the provisions of this section shall be provided to the code official.

**R406.6.2 (N1106.6.2) Compliance report.** Compliance software tools shall generate a report that documents that the energy rating index of the rated design complies with Sections R406.3 and R406.4. The compliance documentation shall include the following information:

1. Address or other identification of the residential building;
2. An inspection checklist documenting the building component characteristics of the rated design. The inspection checklist shall show results for both the ERI reference design and the rated design, and shall document all inputs entered by the user necessary to reproduce the results;
3. Name of individual completing the compliance report; and
4. Name and version of the compliance software tool.

**Exception:** Multiple orientations. When an otherwise identical building model is offered in multiple orientations, compliance for any orientation shall be permitted by documenting that the building meets the performance requirements in each of the four cardinal (north, east, south and west) orientations.

**R406.6.3 (N1106.6.3) Additional documentation.** The code official shall be permitted to require the following documents:

1. Documentation of the building component characteristics of the ERI reference design.
2. A certification signed by the builder providing the building component characteristics of the rated design.
3. Documentation of the actual values used in the software calculations for the rated design.

**R406.7 (N1106.7) Calculation software tools.** Calculation software, where used, shall be in accordance with Sections R406.7.1 through R406.7.3.

**R406.7.1 (N1106.7.1) Minimum capabilities.** Calculation procedures used to comply with this section shall be software tools capable of calculating the energy rating index as described in Section R406.3, and shall include the following capabilities:

1. Computer generation of the ERI reference design using only the input for the rated design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the ERI reference design.
2. Calculation of whole-building, as a single zone, sizing for the heating and cooling equipment in the ERI reference design residence in accordance with Section R403.6.
3. Calculations that account for the effects of indoor and outdoor temperatures and part-load ratios on the performance of heating, ventilating and air-conditioning equipment based on climate and equipment sizing.

4. Printed code official inspection checklist listing each of the rated design component characteristics determined by the analysis to provide compliance, along with their respective performance ratings.

**R406.7.2 (N1106.7.2) Specific approval.** Performance analysis tools meeting the applicable sections of Section R406 shall be *approved*. Tools are permitted to be *approved* based on meeting a specified threshold for a jurisdiction. The *code official* shall approve tools for a specified application or limited scope.

**R406.7.3 (N1106.7.3) Input values.** When calculations require input values not specified by Sections R402, R403, R404 and R405, those input values shall be taken from an *approved* source.

**Add new definitions as follows:**

**RATED DESIGN.** A description of the proposed building used to determine the energy rating index.

**ERI REFERENCE DESIGN.** A version of the *rated design* that meets the minimum requirements of the 2006 *International Energy Conservation Code*.

**Reason:** The residential provisions of the IECC allows for varying methods for demonstrating compliance with the code. This includes both a prescriptive and simulated performance option in addition to allowing efficiency programs that are designed to go above the minimum code levels as “deemed to comply” programs. These above code programs must be approved by the code official to be used in the jurisdiction. Alternative programs that depend on an Energy Rating Index (ERI) have been approved as an alternative code or above code program in at least 6 states and in over 130 jurisdictions. These types of programs typically take the form of a Home Energy Rating System (HERS) program. Under the current code there is no guidance on setting Energy Rating Index scores, which will lead to inconsistent application of these types of programs based on climate zones.

The goal of this proposal is to introduce an Energy Rating Index with established rating numbers into the code that will allow alternative programs to be designed to meet these criteria. The proposal provides guidelines for the development of the index, documentation provided to ensure compliance and a requirement that an approved 3<sup>rd</sup> party verify that the building complies with the applicable Energy Rating Index. The reference house is based on a home built to the 2006 IECC which is consistent with ERI based programs.

The 2009 IECC residential envelope requirements have been set as the least efficient level of efficiency for potential trade-offs to ensure that minimum levels of efficiency that have proven to be cost effective are installed in all buildings and that some flexibility is allowed in the approach to alternative designs. This proposal also requires complying with the applicable mandatory requirements to be consistent with the Above Code section in the IECC. And because energy losses in the domestic hot water distribution system fall outside the scope of the energy rating index as it can be calculated with 2013 methodology, current code provisions relating to hot water pipe insulation are mandatory as well. We anticipate that these requirements can be folded into the energy rating index for the 2018 IECC and thus removed from the mandatory sections then.

This proposal is intended to produce substantial additional energy savings compared to the current or proposed levels of prescriptive requirements in the 2015 IECC while allowing considerably greater flexibility to builders using a method with which a large segment of the market is already familiar. This flexibility is likely to result in lower construction costs for any given level of energy efficiency. Builders who do not make use of this proposed method are still able to comply with the Code can still use any of the existing compliance pathways.

**Cost Impact:** The code change proposal will not increase the cost of construction.

**RE188-13**

Public Hearing:	Committee:	AS	AM	D
	Assembly:	ASF	AMF	DF

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