2018 International Energy Conservation Code

~ Changes to IECC local amendments ~

- Commercial (C)
- Residential (R)
- International Residential Code IRC chapter 11 (N)
C301.5 Local Mechanical Design Parameters remain the same:

- Winter Outdoor Dry-bulb (°F) = 60°
- Summer Outdoor Dry-bulb (°F) = 90°
- Winter Indoor Dry-bulb (°F) = 72°
- Summer Indoor Dry-bulb (°F) = 75°
- Winter Indoor Wet-bulb (°F) = 62°
- Summer Indoor Wet-bulb (°F) = 62°

IRC M1401.3.1 Equipment sizing. Heating & cooling equipment… thermal design parameters in Table R301.2(1) as amended.

- Climatic and Geographic Design Criteria table -
### Table C402.1.5 Envelope requirements for electric heated buildings:

<table>
<thead>
<tr>
<th>Description</th>
<th>R-13+R-7.5 ext ci</th>
<th>R-13+R-7.5 ext ci</th>
<th>CI Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above grade wall – metal bldg wall</td>
<td>R-13+R-10 ci</td>
<td>R-13+R-10 ci</td>
<td>0.052</td>
</tr>
<tr>
<td>Above grade wall – wood framed wall</td>
<td>R-15+R-7.5 ci or R-19+R-5 ci&lt;sup&gt;c&lt;/sup&gt;</td>
<td>R-15+R-7.5 ci or R-19+R-5 ci&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.048</td>
</tr>
</tbody>
</table>

<sup>c</sup> Class 1 vapor retarders (poly) **shall not** be installed on the interior of framed walls where exterior ci value is less than R-7.5.
Table R402.1.2 Insulation & Fenestration Requirements by Component:

<table>
<thead>
<tr>
<th>Heating System Type</th>
<th>Fenestration U-Factor&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Skylight&lt;sup&gt;b&lt;/sup&gt; U-Factor</th>
<th>Glazed Fenestration SHGC</th>
<th>Ceiling R-Value</th>
<th>Wood Frame Wall R-Value&lt;sup&gt;h&lt;/sup&gt;</th>
<th>Mass Wall R-Value&lt;sup&gt;i&lt;/sup&gt;</th>
<th>Floor R-Value&lt;sup&gt;g&lt;/sup&gt;</th>
<th>BSMT&lt;sup&gt;cl&lt;/sup&gt; Wall R-Value</th>
<th>Slab&lt;sup&gt;d&lt;/sup&gt; R-Value &amp; Depth</th>
<th>Crawl&lt;sup&gt;c&lt;/sup&gt; Space Wall R-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Electric heat</td>
<td>0.30</td>
<td>0.55</td>
<td>NR</td>
<td>49</td>
<td>20 or 13+5&lt;sup&gt;hi&lt;/sup&gt;</td>
<td>13/17</td>
<td>30</td>
<td>10/13&lt;sup&gt;i&lt;/sup&gt; 15/19&lt;sup&gt;k&lt;/sup&gt;</td>
<td>10,2 ft</td>
<td>10/13&lt;sup&gt;i&lt;/sup&gt; 15/19&lt;sup&gt;k&lt;/sup&gt;</td>
</tr>
<tr>
<td>Electric Heat</td>
<td>0.30</td>
<td>0.55</td>
<td>NR</td>
<td>49</td>
<td>20+5&lt;sup&gt;hi&lt;/sup&gt;</td>
<td>15/19</td>
<td>30</td>
<td>15/19</td>
<td>10,3 ft</td>
<td>15/19</td>
</tr>
</tbody>
</table>

<sup>1</sup> Class 1 vapor retarders (poly) shall not be installed on the interior of framed walls where exterior ci value is less than R-7.5.

IRC Table 1102.1.2 footnote ‘l’ for BASEMENT WALL R-VALUE: R-15 batt is allowed for existing dwellings with uninsulated basements.
C402.2 / IRC N1102.2 Specific insulation requirements:
All insulation shall be installed to meet Residential Energy Services Network (RESNET) **Grade 1** standard. *Additionally but indirectly; IECC R303.2 Installation.*
C402.2.4 / R402.2.10 / IRC N1102.2.10 Slabs-on-grade perimeter insulation (Mandatory):

“The perimeter insulation shall extend downward from the top of the slab…”
2018 IECC Amendments

R402.4.1.2 / N1102.4.1.2 Testing *(Air Tightness Testing)*: ...in accordance with Section 802 of the RESNET Mortgage Industry National Home Energy Rating Standards and RESNET / ICC 380, ASTM E779 or ASTM E1827...

*What this means:* multipoint air leakage tests can now be reported at a minimum of 5 pressure differences instead of the previous minimum of 7 pressure differences.

image courtesy of The Energy Conservatory
R403.3.7 / N1103.3.7 Ducts located in conditioned space. For ducts to be considered as inside conditioned space, the duct system shall be located completely within the continuous air barrier and within the building thermal envelope.

Note: Compliance alternative 2 was amended out.
R405 Simulated Performance Alternative

- **R405.1 / IRC N1105.1 Scope** …In addition, requirements for the Simulated Performance Alternative (SPA) are detailed within The City of Fort Collins Residential New Construction SPA Guide.

The guide states: Per 2018 IECC code section R405.4.2.2 the compliance report submitted for obtaining the certificate of occupancy shall include code report items 1-6 and include the Home Energy Rating Certificate with corresponding HERS score.
### Commercial

**Table C402.1.3 Envelope Insulation Minimum Requirements**

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>5 AND MARINE 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>All other</td>
<td>Group R</td>
</tr>
</tbody>
</table>

- **2015 IECC**
  - Heated slabs
    - R-15 for 36" below
    - R-15 for 36" below

- **2018 IECC**
  - Heated slabs\(^h\)
    - R-15 for 36" below + R-5 full slab
    - R-15 for 36" below + R-5 full slab

\(^h\) - Heated slabs require additional insulation.
### Table C402.1.4 Opaque Thermal Envelope

#### Opaque doors

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>5 AND MARINE 4</th>
<th>All other</th>
<th>Group R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garage door &lt;14% glazing</td>
<td>U-0.31</td>
<td>U-0.31</td>
<td></td>
</tr>
</tbody>
</table>
C402.2.5 Below-grade walls. ...The C-Factor or R-Value required shall extend to a depth of not less than 10 feet below the outside finished ground level, or to the level of the lowest floor of the conditioned space enclosed by the below-grade wall, whichever is less.

C402.2.7 Airspaces. When the thermal properties of airspaces are calculated as part of the thermal wall assembly, these airspaces must be enclosed in an unvented cavity designed to minimize airflow into and out of the cavity.

Note: R-Value determination factor(s) found in ASHRAE Handbook of Fundamentals

C405.2.1 Occupant sensor controls. This was expanded to included lighting controls for offices, including open plan office areas.
Section C406
Additional Efficiency Packages

C406.9 Reduced Air Infiltration. Air infiltration shall be verified by whole-building pressurization testing… The measured air-leakage rate of the building envelope shall not exceed 0.25 cfm/ft²…

*Now a compliance option within code and COMcheck (if on the most current version).
C407.3 Performance-based compliance. …The reduction in energy cost of the proposed design associated with on-site renewable energy shall be not more than 5% of the total energy cost.

Residential

Table R402.1.2 (R402.1.4) / IRC N1102.1.2 (N1102.1.4) Improved window efficiency

<table>
<thead>
<tr>
<th>CLIMATE ZONE</th>
<th>FENESTRATION U-FACTOR&lt;sup&gt;b&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 and Marine 4</td>
<td>0.32 0.30</td>
</tr>
</tbody>
</table>
Table R402.1.2 / IRC N1102.1.2 Heated slab insulation

**Footnote d:** R-5 insulation shall be provided under the full slab area of a heated slab in addition to the required slab edge insulation R-value for slabs, as indicated in the table. The slab edge insulation for heated slabs shall not be required to extend below the slab.
Table R403.6.1 / IRC N1103.6.1 Whole House Mechanical Ventilation System Fan Efficacy.  
*Note: Most already meet this* (language not specific to supply air temp): 
- A minimum fan efficiency of 1.2 cfm/watt is required for HRV and ERV’s

<table>
<thead>
<tr>
<th>FAN LOCATION</th>
<th>AIR FLOW RATE MINIMUM (CFM)</th>
<th>MINIMUM EFFICACY (CFM/WATT)</th>
<th>AIR FLOW RATE MAXIMUM (CFM)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HRV or ERV</td>
<td>Any</td>
<td>1.2 cfm/watt</td>
<td>Any</td>
</tr>
</tbody>
</table>

R404.1 / IRC N1104.1 Lighting equipment *(Mandatory)*. Not less than 90% of the permanently installed lighting fixtures shall contain only high-efficacy lamps.
R406.4 / IRC N1106.4 Minimum Energy Rating Index (ERI)*

<table>
<thead>
<tr>
<th>Climate Zone</th>
<th>Energy Rating Indexa</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>55 61</td>
</tr>
</tbody>
</table>

a. Where on-site renewable energy is included for compliance… building thermal envelope shall be ≥ to Table R402.1.2 / N1102.1.2 of the 2015 IECC or IRC.

*2009 backstop in effect for buildings w/out renewable energy.
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