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Prepared for the U.S. Department of Energy
under Contract DE-AC05-76RL01830

# Energy Provisions of the ICC-700, LEED for Homes, and ENERGY STAR Mapped to the 2009 IECC

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May 2011

Pacific Northwest
NATIONAL LABORATORY

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# Summary

This document provides the results of a comparison of building energy efficient elements of the ICC-700 National Green Building Standard, LEED for Homes, and ENERGY STAR versions 2, 2.5, and 3.0 to the 2009 International Energy Conservation Code (2009 IECC). This comparison will provide a tool for states and local municipalities as they consider adoption of these programs. The comparison is presented in a series of appendices. The first appendix provides a summary chart that visually represents the comprehensive comparison of the programs to the 2009 IECC topic areas. Next there are a series of individual tables (one appendix for each program) that include the specific program mapping to the 2009 IECC elements with comments that briefly discuss how well the elements mapped. Finally, a comprehensive table is included that shows all five of the programs mapped to the 2009 IECC elements to allow a detailed comparison.

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# Appendix A

# Mapping Summary

| ***Mapping Existing Systems to IECC 2009*** | **ICC-700 Bronze** | **LEED for Homes Certified** | **ENERGY STAR V2.0** | **ENERGY STAR V2.5** | **ENERGY STAR V3.0** |
|---|---|---|---|---|---|
| ● *Exceeds the Requirements*<br>● *Specifies the same requirements*<br>◐ *Specifies partial requirements*<br>○ *Similar topics, but not required (may be optional)*<br>*NM* *Not mentioned in the document*<br>*NA* *No requirement in this section of the rating system* | | | | | |
| ***Energy Efficiency - Residential*** | | | | | |
| ***Building Thermal Envelope (402)*** | | | | | |
| *402.1 General (Prescriptive).* | | | | | |
| *402.1.1 Insulation and fenestration criteria.* | **NA** | ◐ | ● | ○ | ● |
| *402.1.2 R-value computation.* | **NA** | ● | **NA** | ○ | ● |
| *402.1.3 U-factor alternative.* | **NA** | ◐ | ◐ | ○ | ● |
| *402.1.4 Total UA alternative.* | ○ | ◐ | ◐ | ○ | ● |
| *402.2 Specific insulation requirements (Prescriptive).* | | | | | |
| *402.2.1 Ceilings with attic spaces.* | **NA** | ● | ● | ○ | ● |
| *402.2.2 Ceilings without attic spaces.* | **NA** | ● | ● | ○ | ● |
| *402.2.3 Access hatches and doors.* | ◐ | **NM** | ● | ○ | ● |
| *402.2.4 Mass walls* | ● | ● | ● | ○ | ● |
| *402.2.5 Steel-frame ceilings, walls, and floors.* | **NA** | ● | ◐ | ○ | ● |
| *402.2.6 Floors.* | ● | ● | ● | ○ | ● |
| *402.2.7 Basement walls.* | ○ | ● | ● | ○ | ● |
| *402.2.8 Slab-on-grade floors.* | **NM** | ● | ● | ○ | ● |
| *402.2.9 Crawl space walls.* | ● | ● | ● | ○ | ● |
| *402.2.10 Masonry veneer.* | **NM** | ● | ● | ○ | ● |
| *402.2.11 Thermally isolated sunroom insulation.* | **NM** | ● | ● | ○ | ● |
| *402.3 Fenestration (Prescriptive).* | | | | | |
| *402.3.1 U-factor.* | ◐ | **NM** | ● | ○ | ● |
| *402.3.2-402.3.3.* | ● | ◐ | ● | ○ | ● |
| *402.3.4 Opaque door exemption.* | **NA** | **NM** | ◐ | ○ | ● |
| *402.3.5 Thermally isolated sunroom U-factor.* | **NM** | **NM** | **NM** | ○ | ● |
| *402.3.6 Replacement fenestration.* | ● | **NM** | **NM** | ○ | ● |

| | | | | | |
|---|---|---|---|---|---|
| *402.4 Air leakage (Mandatory).* | | | | | |
| *402.4.1 Building thermal envelope.* | ◐ | NM | ● | ● | ● |
| *402.4.2 Air sealing and insulation.* | ○ | ● | ● | ● | ● |
| *402.4.3 Fireplaces.* | ○ | ◐ | NM | NM | NM |
| *402.4.4 Fenestration air leakage.* | NM | NM | ● | ○ | ● |
| *402.4.5 Recessed lighting.* | ● | NM | ● | ● | ● |
| *402.5 Maximum fenestration U-factor and SHGC (Mandatory).* | ◐ | NM | NM | ○ | ● |
| ***Systems (403)*** | | | | | |
| *403.1 Controls (Mandatory).* | | | | | |
| *403.1.1 Programmable thermostat.* | ○ | ◐ | ● | ○ | ● |
| *403.1.2 Heat pump supplementary heat.* | ○ | ◐ | NM | ○ | ● |
| *403.2 Ducts.* | | | | | |
| *403.2.1 Insulation (Prescriptive).* | ○ | ◐ | ◐ | ○ | ● |
| *403.2.2 Sealing (Mandatory).* | ◐ | ◐ | ● | ● | ● |
| *403.2.3 Building cavities (Mandatory).* | ● | ● | ● | ○ | ● |
| *403.3 Mechanical system piping insulation (Mandatory).* | NM | ○ | NM | NM | NM |
| *403.4 Circulating hot water systems (Mandatory).* | ○ | ○ | ◐ | NM | NM |
| *403.5 Mechanical ventilation (Mandatory).* | NM | NM | ◐ | NM | NM |
| *403.6 Equipment sizing (Mandatory).* | ● | ● | ◐ | ○ | ● |
| *403.7 Systems serving multiple dwelling units (Mandatory).* | NA | NA | NA | NA | NA |
| *403.8 Snow melt system controls (Mandatory).* | NM | NM | NM | NM | NM |
| *403.9 Pools (Mandatory).* | | | | | |
| *403.9.1 Pool heaters.* | NM | NM | NM | NM | NM |
| *403.9.2 Time switches.* | NM | NM | NM | NM | NM |
| *403.9.3 Pool covers.* | NM | NM | NM | NM | NM |
| ***Electrical Power and Lighting (404)*** | | | | | |
| *404.1 Lighting equipment (Prescriptive).* | ○ | ○ | ◐ | ○ | ◐ |
| ***Simulated Performance Alternative (405)*** | | | | | |
| *405.2 Mandatory requirements.* | ○ | ● | NM | ○ | ● |
| *405.3 Performance-based compliance.* | ● | ◐ | ◐ | ◐ | ◐ |
| *405.4 Documentation.* | ● | NM | NM | NM | NM |
| *405.5 Calculation procedure.* | ● | NM | NM | NM | NM |
| *405.6 Calculation software tools.* | ● | NM | NM | NM | NM |

# Appendix B

# ICC-700 Bronze Level Mapping

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific insulation R-values: ICC 700 awards optional points under the alternative UA path (see below description under Section 402.1.4).* |
| Prescriptive | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific insulation R-values: ICC 700 awards optional points under the alternative UA path (see below description under Section 402.1.4).* |
| Prescriptive | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific assembly U-factor: ICC 700 awards optional points under the alternative UA path (see below description under Section 402.1.4).* |
| Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than or equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | **703.1 Building Envelope**<br>703.l.1 (Optional, Prescriptive path) Where the total building thermal envelope UA is less than required by the 2006 IECC Section 402.1.4, the total building thermal envelope UA is in accordance with Table 703.1.1. Where insulation is used to achieve these percentages, a third-party grading of the installation as achieving Grade 1 is required. | *Optional - If the prescriptive path is chosen, and the maximum ICC 700 points are achieved (20 % improvement) the 2009 IECC requirement is met. This is an alternative to IECC Section 402.1.1.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific insulation R-values: ICC 700 awards optional points under the alternative UA path (see below description under Section 402.1.4).* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings without attic spaces. | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific insulation R-values: ICC 700 awards optional points under the alternative UA path (see below description under Section 402.1.4).* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | | 402.1.3 and the total UA alternative in Section 4-2.1.4. | | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | **Section 701.4.3.4 Ceilings and attics. (1) Attic Access (except unvented attics). (Mandatory)** Attic access, knee wall door, or drop-down stair is covered with insulation and gasketed. | *ICC 700 does not fully meet the 2009 IECC requirement. It does not specify that attic access must be insulated to the same R-value as the surrounding assemblies.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.4 Mass walls. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | **Section 202 - Definitions** Mass Walls. Walls constructed of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick, earth (adobe, compressed earth block, rammed earth), and/or solid timber/logs, with a minimum of 50 percent of the required R-value on the exterior of the wall. | *The ICC 700 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>Exception: In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ICC 700 does not require specific insulation R-values: ICC 700 awards optional points under the alternative UA path (see description under Section 402.1.4).* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | **701.4.3.2 Floors, foundations, and crawlspaces (Mandatory)**<br>(1) Floors. (including insulated floors above garages and cantilevered floors)<br>(a) Insulation is installed to maintain permanent contact with the underside of the subfloor decking, enveloping any attached ductwork within the thermal envelope without compression or air gaps in the insulation. This practice does not apply to ducts or other mechanical equipment that is adjacent to the underside of the subfloor.<br>(b) Batt and loose-fill insulation is held in place by permanent attachments or systems in | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | | | accordance with the manufacturer's instructions. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 402.1.1 and 402.2.6. | **703.1 Building Envelope (Optional, Prescriptive path)**<br>703.1.2 The insulation installation is graded by a third party and is in accordance with Sections 703.1.2.1, 703.1.2.2, 703.1.2.3, and/or 703.1.2.4 as applicable. (Points not awarded in this section if already awarded under Section 703.1.1)<br>703.1.2.2 Grade 1 installation is in accordance with the following:<br>(1) Insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).<br>(8) Grade 1 insulation meets or exceeds all requirements for Grade 2 insulation.<br>703.1.2.3 Grade 2 insulation is in accordance with the following:<br>(2) In conditioned basements or crawlspaces the following apply:<br>(a) insulation is installed in complete contact with the subfloor surfaces.<br>(b) floor insulation over vented or ambient conditions is enclosed on six sides.<br>(3) Floor insulation over unconditioned basements is not required to be enclosed on six sides. | *Optional - If points for Grade 1 insulation are achieved, IECC requirement will be met. ICC 700 requires uniform insulation from top-to-bottom of cavities, which is more stringent that 2009 IECC requirement to be insulated from top of the basement wall down to 10 feet below grade or to the basement floor, whichever is less.*<br><br>*If points for Grade 2 insulation are achieved, 2009 IECC requirement will not be met because Grade 2 insulation does not require wall insulation in conditioned basements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | - | *Not explicitly mentioned in ICC 700.* |
| Prescriptive | 402.2 Specific | As an alternative to insulating floors over crawl | **701.4.3 Insulation and air sealing (Mandatory)** | *Mandatory - ICC 700 requirement meets the* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | insulation requirements. 402.2.9 Crawl space walls. | spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | (2) Crawlspace. Where insulated, crawlspace wall insulation is permanently attached to the walls. Exposed earth in unvented crawlspaces is covered with continuous vapor retarder with overlapping joints that are taped or masticed. | *2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | - | *Not explicitly mentioned in ICC 700.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | - | *Not explicitly mentioned in ICC 700.* |
| Prescriptive | 402.3 Fenestration. 402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | **701.4.4 Fenestration (Mandatory)** 701.4.4.1 NFRC-certified U-factor and SHGC windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice. **703.3 Fenestration (Optional, Prescriptive path)** 703.3.1 The NFRC-certified (or equivalent) U-factor and SHGC for windows...are in accordance with Table 703.3.1(a) or (b)... | *ICC 700 Table 701.4.4.1, 703.3.1(a), and 703.3.1(b) specify U-factors, which is similar but not identical to the IECC 2009 requirement. The ICC 700 Mandatory U-factors for Zone 3 do not meet the IECC 2009 values in Table 402.1.1 and 402.1.3.* |
| Prescriptive | 402.3 Fenestration. 402.3.2-402.3.3. | 402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements. 402.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4m2) of glazed fenestration per | **701.4.4.1 (Mandatory)** ...Decorative fenestration elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice. **703.3.1. (Optional)**...Decorative fenestration | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement: ICC 700 allows the same exemption as 2009 IECC.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | | dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice. | |
| Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | - | *ICC 700 section 703.1 complies with the total UA alternative approach in 2009 IECC 402.1.4, thus the exemption does not apply.* |
| Prescriptive | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | - | *Not explicitly mentioned in ICC 700.* |
| Prescriptive | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. | **703.3 Fenestration (Optional, Prescriptive Path)**<br>Renovation Note: Section 703.3.1 applies only to the replacement of existing windows. Points available on the basis of a ratio of new window area to total window area (new window area/total window area). | *Designation between new construction and renovation is only made in the ICC 700 optional prescriptive path. Assuming that mandatory requirements in section 701.4.4.1 are required for new construction and renovations, the 2009 IECC requirements are met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *General guidance - not a unique requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | **701.4.3 Insulation and air sealing (Mandatory).** 701.4.3.1 General. Insulation and air sealing is in accordance with the following:<br>(1) Insulation. Insulation is installed in accordance with the manufacturer's instructions or local code, as applicable.<br>(2) Shafts (duct shaft, piping shaft/penetrations, flue shaft). Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam. Fire-rated collars and caulking are installed where required.<br><br>**703.2.1.2 Air Barriers (Optional, Prescriptive path).** Air barrier is installed at any exterior edge | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | | | of insulation at floors, foundations, and crawlspaces including insulated floors above garages and cantilevered floors. | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (2) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 2. Site-built windows, doors and skylights. | **701.4.3 Insulation and air sealing (Mandatory).** 701.4.3.3 Walls (1) Windows and doors. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier. (4) Skylights and knee walls. Skylight shafts and knee walls are insulated to the same level as the exterior walls. **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.3 Walls (4) Skylight shafts and knee walls are air sealed. Insulation on attic knee walls and skylight shafts are physically supported by stapling in place, netting, or using other mechanical attachment. | *Mandatory - ICC 700 requirement for doors and windows meets the 2009 IECC requirement.* *Mandatory ICC 700 points for skylights cover insulation levels. Optional ICC 700 points for skylights cover air barriers. If the optional points are achieved, all IECC requirements will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 3. Openings between window and door assemblies and their respective jambs and framing. | **701.4.3 Insulation and air sealing (Mandatory).** 701.4.3.3 Walls (1) Windows and doors. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier. | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 4. Utility penetrations. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.1.2 Plumbing and wiring (1) At a minimum, insulation is placed between the outside (ceiling, wall, or floor) and the pipes. (2) Batt insulation is split or cut to fit around wiring and plumbing. (3) Sprayed insulation is installed to encapsulate pipes where the pipe temperature is 180 egress F (82.2 C) or less. Wiring is fastened in place to prevent displacement prior to spraying. 703.2.1.3 Walls (2) Air-sealed-type electrical outlet boxes are installed or the air barrier extends completely behind the boxes. Insulation is placed between the sheathing and the rear of the electrical or phone boxes located on exterior walls. Electrical outlet boxes are covered prior to spraying insulation. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.4 Ceilings and attics. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ICC-700 | Comments |
|---|---|---|---|---|
| | | 5. Dropped ceilings or chases adjacent to the thermal envelope. | (1) At dropped ceilings and soffits, the air barrier is substantially aligned with insulation and any gaps are sealed with caulk, foam, or tape. | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 6. Knee walls. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.3 Walls (4) Skylight shafts and knee walls are air sealed. Insulation on attic knee walls and skylight shafts are physically supported by stapling in place, netting, or using other mechanical attachment. 703.2.1.4 Ceilings and attics. (2) Access to vented attics, including knee wall doors and/or drop down stairs, is caulked, gasketed, or otherwise sealed. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 7. Walls and ceilings separating a garage from conditioned spaces. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.2 Air barriers. Air barrier is installed at any exterior edge of insulation at floors, foundations, and crawlspaces including insulated floors above garages and cantilevered floors. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 8. Behind tubs and showers on exterior walls. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.3 Walls (1) Exterior wall(s) behind the tub/shower is insulated and includes an interior and exterior air barrier. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 9. Common walls between dwelling units. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.3 Walls (3) Duplex and townhouse construction: In the common walls between dwelling units (e.g., gypsum shaft wall), an air barrier is installed to seal the gap between the common wall and the structural framing. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 10. Attic access openings. | **703.2 Insulation and air sealing (Optional, Prescriptive path).** 703.2.1.4 Ceilings and attics. (2) Access to vented attics, including knee wall doors and/or drop down stairs, is caulked, gasketed, or otherwise sealed. | *Optional - if the ICC 700 points are achieved the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 11. Rim joist junction. | **701.4.3. Insulation and air sealing (Mandatory)** 701.4.3.3 Walls (2) Band joist and rim joints. Band and rim joists are insulated and air sealed. | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air | **701.4.3.3 Walls (Mandatory)** (3) Between foundation and sill plate bottom | *Although ICC 700 includes mandatory and optional points for other sources of infiltration,* |

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| | thermal envelope. (12) | barrier material, suitable film or solid material:<br>12. Other sources of infiltration. | plate...<br>(5) Exterior architectural features. Code required building envelope insulation and air sealing are not disrupted at exterior architectural features such as stairs and decks.<br>**703.2.1.1.4 HVAC register boots (Optional).**<br>HVAC register boots that penetrate the building envelope are caulked or sealed to the subfloor or drywall.<br>**703.2.1.4 Ceilings and attics (Optional).**<br>(3) An insulated cover is gasketed or sealed to the attic opening where a whole building or whole dwelling unit fan penetrates into the attic. | *ICC 700 does not include a general overarching requirement like the 2009 IECC, thus the requirement is only partially met.* |
| Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.1 Testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.<br>During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be turned off;<br>6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | **704.6 Installation and performance verification (Optional).**<br>704.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Minimum of two inspections are performed. One inspection after insulation is installed and prior to being covered, and another inspection upon completion of the project...<br>704.6.2 Third party testing is conducted to verify performance.<br>704.6.2.1 Building envelope leakage rate is demonstrated by blower door test. In addition to the test, the following practices are required...<br>(4) The maximum leakage rate is in accordance with:<br>(a) 5 ACH50 (3 points)<br>(b) 4 ACH50 (6 points)<br>(c) 3 ACH50 (9 points)<br>(d) 2 ACH50 (12 points)<br>(e) 1 ACH50 (15 points) | *Optional - If the minimum ICC 700 points (3) are achieved, a maximum allowable leakage rate of 3 air changes per hour (ACH) at a pressure of 50 Pa is required, which is less than the 2009 IECC maximum rate of 7 ACH50 and the 2009 IECC requirement will be met.* |
| Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.2 Visual inspection option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation | **703.2 Insulation and air sealing (Optional, Prescriptive path).**<br>703.2.1 Insulation and air sealing is installed in accordance with all of the following [Sections 703.2.1.1-703.2.1.4], as applicable:<br>(1) third-party verification performed | *Optional - If the ICC 700 points under Section 703.2 and 704.6 are achieved ,in either section, the 2009 IECC requirement will be met.* |

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| | | shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | **704.6 Installation and performance verification (Optional).**<br>704.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable. Minimum of two inspections are performed. One inspection after insulation is installed and prior to being covered, and another inspection upon completion of the project... | |
| Mandatory | 402.4 Air leakage.<br>402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | **703.2.1.1.5 Masonry Fireplaces (Optional, Prescriptive path)**. Masonry fireplaces are equipped with gasketed doors, outside combustion air, and a chimney top damper. | *Optional - If points are achieved the ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.<br>Exceptions: Site-built windows, skylights and doors. | - | *Not explicitly mentioned in ICC 700.* |
| Mandatory | 402.4 Air leakage.<br>402.4.5 Recessed lighting. | Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | **701.4.3.4 Ceilings and attics (Mandatory)**<br>(2) Recessed lighting. Recessed light fixtures that penetrate the thermal envelope are airtight, IC-rated, and sealed with gasket, caulk, or foam. | *Mandatory - The ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | - | *ICC 700 requires compliance with the 2006 IECC. The 2006 IECC SHGC values are slightly higher than the 2009 IECC, therefore, the ICC 700 does not fully meet the 2009 IECC requirement.* |
| Mandatory | 403.1 Controls.<br>403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system.<br>403.1.1 Programmable thermostat. Where the primary heating system is a forced-air furnace, at | **703.4 HVAC equipment efficiency (Optional, Prescriptive path)**<br>703.4.10 An ENERGY STAR, or equivalent, programmable thermostat is installed to control | *Optional - If the ICC 700 points are achieved, 2009 IECC requirement is not necessarily met since the 2009 IECC defines specific parameters for the programmable thermostat* |

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| | | least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | each heating and cooling zone.<br>**705.1 Energy consumption control. (Optional)**<br>A whole building or whole dwelling unit device is installed that controls or monitors energy consumption.<br>(1) programmable communicating thermostat<br>(2) Energy-monitoring device<br>(3) energy management control system | *and ICC 700 does not.* |
| Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | **703.4 HVAC equipment efficiency (Optional, Prescriptive path)**<br>703.4.4 Heat pump heating efficiency is in accordance with Table 703.4.4. Refrigerant charge is verified for compliance with manufacturer's instructions.<br>Zones 5-9 require consideration for use of resistance heat in cold climates when installing a heat pump. | *Optional - If the ICC 700 points are achieved, the 2009 IECC requirements may or may not be met because supplementary resistance heating controls are not mentioned in ICC 700.* |
| Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.<br>Exception: Ducts or portions thereof located completely inside the building thermal envelope. | **704.4 Ducts (Optional).**<br>704.4.2 Space heating is provided by a system that does not include air ducts.<br><br>704.4.3 Space cooling is provided by a system that does not include air ducts. | *Optional - If the ECC 700 points for ductless systems are achieved, the 2009 IECC requirement will be met.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. | **701.4.2 Duct systems (Mandatory).**<br>701.4.2.1 Ducts are sealed with tape complying with UL 181, mastic, gaskets, or an approved system as required by the IRC, Section M1601.3.1, or IMC, Section 603.9, to reduce leakage. | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following:<br>1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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.<br>2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 | **704.6 Installation and performance verification. (Optional)**<br>704.6.2.2 The entire central HVAC duct system, including air handlers and register boots, is tested for leakage at a pressure differential of 0.1 inches w.g. (25 Pa). The maximum leakage as a percent of the system design flow rate is in accordance with the following:<br>(1) 6 percent for ductwork entirely outside the building's thermal envelope<br>(2) 6 percent for ductwork entirely inside the building's thermal envelope<br>(3) 6 percent for ductwork both inside and outside the building's thermal envelope | *Optional - If the ICC 700 points are achieved, the 2009 IECC requirement will be met.* |

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| | | m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area.<br>Exceptions: Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | | |
| Mandatory | 403.2 Ducts. 403.2.3 Building cavities. | Building framing cavities shall not be used as supply ducts. | **701.4.2 Duct Systems (Mandatory).**<br>701.4.2.2 Building cavities are not used as supply ducts. | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | - | *Not explicitly mentioned in ICC 700.* |
| Mandatory | 403.4 Circulating hot water systems. | All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | **703.5 Water heating design, equipment, and insulation (Optional, Prescriptive path).**<br>703.5.4 Insulating hot water pipes<br>703.5.4.1 Hot water lines are insulated to a minimum of R-4. | *Optional - If the ICC 700 points are achieved, the 2009 IECC requirements will be partially met - the insulation requirements of the 2009 IECC will be met but the ICC 700 does not mention switches for circulating pumps.* |
| Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | - | *Not explicitly mentioned in ICC 700.* |
| Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | **701.4.1 HVAC systems (Mandatory).**<br>701.4.1.1 Space heating and cooling systems/equipment is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent.<br>701.4.1.2 Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed using industry-approved guidelines (e.g., ACCA Manual J, GAMA H-22, or an accredited design professional's and manufacturer's recommendations). | *Mandatory - ICC 700 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | | *Commercial requirements are outside of the scope of this analysis.* |
| Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and no precipitation is falling and an automatic or manual control that will allow | - | *Not explicitly mentioned in ICC 700.* |

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| | | shutoff when the outdoor temperature is above 40°F. | | |
| Mandatory | 403.9 Pools. 403.9.1 Pool heaters. | Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.3.<br>403.9.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights. | - | *Not explicitly mentioned in ICC 700.* |
| Mandatory | 403.9 Pools. 403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.<br>Exceptions:<br>1. Where public health standards require 24-hour pump operation.<br>2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | *Not explicitly mentioned in ICC 700.* |
| Mandatory | 403.9 Pools. 403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.<br>Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | *Not explicitly mentioned in ICC 700.* |
| Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. | **704.2 Lighting and appliances**<br>704.2.1 Hard-wired lighting is in accordance with one of the following:<br>(1) A minimum of 50 percent of the total hard-wired lighting fixtures, or the bulbs in those fixtures, qualify as ENERGY STAR or equivalent.<br>(2) A minimum of 50 percent of the total hard-wired lighting fixtures qualify as ENERGY STAR or equivalent.<br>(3) A minimum of 80 percent of the exterior lighting wattage has an efficiency of 40 lumens per watt minimum or be a solar-powered light fixture. | *Optional - If the ICC 700 points for option 1 or 2 are achieved, the 2009 IECC requirement will be met.* |
| Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | **704.4 Ducts.**<br>704.4.2 Space heating is provided by a system that does not include air ducts. (15 points)<br>704.4.3 Space cooling is provided by a system that does not include air ducts. (15 points) | *Optional - If the ICC 700 points are achieved for section 704.4.2 OR 704.4.4, the 2009 IECC requirement will be met indirectly because there will be no supply or return ducts outside of the building thermal envelope.* |

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| | | | 704.4.4 Ductwork is in accordance with all of the following: (12 points)<br>(1) Building cavities are not used as return ductwork.<br>(2) Heating and cooling ducts and mechanical equipment are installed within the conditioned building space.<br>(3) Ductwork is not installed in exterior walls. | |
| Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required.<br>(1) 15 percent (Mandatory - minimum requirement)<br>(2) 30 percent<br>(3) 50 percent<br>(4) 60 percent | *ICC 700 requires a minimum of 15% improvement in energy cost performance. If a project follows the performance path, the 2009 IECC requirement will be met.* |
| Performance | 405.4 Documentation. 405.4.1 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. | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(1) | The compliance documentation shall include the following information:<br>1. Address or other identification of the residence; | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009* |

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| | | | following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *IECC.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>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. | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.5 Calculation procedure. | 405.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>405.5.2 Residence specifications. The standard | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |

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| | | reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(2) | Calculation procedures ... and shall include the following capabilities:<br>2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | **702.2 Energy cost performance levels (Performance Path).** Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities:<br>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. | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities:<br>4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.2 | Performance analysis tools meeting the applicable sections of Section 405 shall be | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the* |

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| | Specific approval. | permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | *performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |
| Performance | 405.6 Calculation software tools. 405.6.3 Input values. | When calculations require input values not specified by Sections 402, 403, 404 and 405, those input values shall be taken from an approved source. | **702.2 Energy cost performance levels (Performance Path)**. Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or IECC Section 506.2 through 506.5, applied as defined in the IECC, is required. | *ICC 700 requires documentation in accordance with 2006 IECC if a project follows the performance path. The requirement in the 2006 IECC meets the requirement of the 2009 IECC.* |

# Appendix C

# LEED for Homes Certified Level Mapping

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code.<br>**EA 4: Windows - Prescriptive Path**<br>Prerequisite 4.1 Good Windows (Mandatory). Meet all of the following requirements…design and install windows and glass doors that have NFRC ratings that meet or exceed the window requirements of the ENERGY STAR for Homes national Builder Option Package (Table 1).<br>**Credit 4.2 Enhanced Windows (Optional).** Design and install windows and glass doors...that exceed...Table 1.<br>OR<br>**Credit 4.3 Exceptional Windows (Optional).** Design and install windows and glass doors...that substantially exceed...Table 1. | *LEED for Homes requires compliance with the 2004 IECC. Table 402.1 of the 2004 IECC meets or exceeds Table 402.1.1 for all R-value requirements EXCEPT Mass Walls and Basement Walls. Table 402.1.2 meets or exceeds Table 402.1.3 for all equivalent U-factor requirements EXCEPT Floors and Basement Walls.*<br><br>*Under LEED for Homes prerequisite 4.1, homes in the Northern or North Central zones meet the IECC requirements for fenestration U-factor and SHGC. Homes in the South Central and Southern zones meet the fenestration U-factor requirements but not the SHGC requirements.*<br><br>*If homes in the South Central or Southern zones achieve the optional LEED for Homes points under Credit 4.3, the IECC SHGC requirements will be met.* |
| Prescriptive | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirement, which meets the 2009 IECC requirement.* |
| Prescriptive | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC. Table 402.1.3 of the 2004 IECC meets or exceeds Table 402.1.3 of the 2009 IECC for all equivalent U-factor requirements EXCEPT Fenestration, Floors and Basement Walls.* |
| Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than or equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC. Table 402.1 of the 2004 IECC meets or exceeds Table 402.1.1 for all R-value requirements EXCEPT Mass Walls and Basement Walls. Table 402.1.2 meets or exceeds Table 402.1.3 for all equivalent U-factor requirements EXCEPT Floors and Basement Walls.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| Prescriptive | 402.2 Specific insulation requirements. 402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings without attic spaces. | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 4-2.1.4. | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC. Access hatches and doors are not explicitly mentioned in 2004 IECC.* |
| Prescriptive | 402.2 Specific insulation requirements. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete | **EA 2: Insulation - Prescriptive Path** **Prerequisite 2.1 Basic Insulation (Mandatory).** Meet all the following requirements: | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |

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| | 402.2.4 Mass walls. | form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method. Exception: In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | **EA 2: Insulation - Prescriptive Path** **Prerequisite 2.1 Basic Insulation (Mandatory).** Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 402.1.1 and 402.2.6. | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of | **EA 2: Insulation - Prescriptive Path** Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements: a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |

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| | | soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.9 Crawl space walls. | As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | **EA 2: Insulation - Prescriptive Path**<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | *LEED for Homes requires compliance with the 2004 IECC R-value requirements, which meets the 2009 IECC requirements.* |
| Prescriptive | 402.3 Fenestration. 402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | - | *Not explicitly mentioned in LEED for Homes.* |
| Prescriptive | 402.3 Fenestration. 402.3.2-402.3.3. | 402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall | **EA 4: Windows - Prescriptive Path**<br>Note: Up to 0.75% of the window-to-floor area may be used for decorative glass or skylight area that does not | *LEED for Homes allows an exception for a percentage of the window-to-floor area. IECC allows an exception for up to 15 square feet of* |

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| | | be permitted to satisfy the SHGC requirements.<br>402.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4m2) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | meet the U-factor and SHGC requirements above. | *glazed fenestration per dwelling unit. The exceptions are similar but not identical. IECC requirements may or may not be met.* |
| Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | - | *Not explicitly mentioned in LEED for Homes.* |
| Prescriptive | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | - | *Not explicitly mentioned in LEED for Homes.* |
| Prescriptive | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. | - | *Not explicitly mentioned in LEED for Homes.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *General guidance - not a unique requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | (2) | material:<br>2. Site-built windows, doors and skylights. | | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>3. Openings between window and door assemblies and their respective jambs and framing. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>4. Utility penetrations. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>5. Dropped ceilings or chases adjacent to the thermal envelope. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>6. Knee walls. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>7. Walls and ceilings separating a garage from conditioned spaces. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>8. Behind tubs and showers on exterior walls. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>9. Common walls between dwelling units. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |

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| | | 10. Attic access openings. | | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>11. Rim joist junction. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (12) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>12. Other sources of infiltration. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific air sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.2 Air sealing and insulation. 402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.1 Testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.<br>During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be turned off;<br>6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | **EA 3: Air Infiltration - Prescriptive Path**<br>Pre-requisite 3.1 (Mandatory). Reduced Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater.<br>Credit 3.2 (Optional). Greatly Reduced Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater.<br>OR<br>Credit 3.3 (Optional) Minimal Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater. | *Mandatory maximum air changes per hour (ACH) allowed in LEED for Homes Table 1 is seven ACH50 for IECC Climate Zones 1-2. Specified ACH are below seven for other Climate Zones. The 2009 IECC requirement are met.*<br><br>*Optional LEED for Homes points go beyond the IECC requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.2 Air sealing and insulation. 402.4.2.2 Visual | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2: | - | *LEED for Homes meets alternative IECC requirement in Section 402.4.2.1.* |

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| | inspection option. | 402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | | |
| Mandatory | 402.4 Air leakage. 402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | **EQ 2: Combustion Venting - Prescriptive Path Prerequisite 2.1 Basic Combustion Venting Measures (Mandatory).** Meet all the following requirements…<br>c) All fireplaces and woodstoves must have doors.<br>d) Space and water heating equipment that involves combustion must meet one of the following...<br>i. it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting<br>ii. it must be designed and installed with power-vented exhaust; or<br>iii. it must be located in a detached utility building or open-air facility.<br><br>**Credit 2.2 Enhanced Combustion Venting Measures (Optional).** Install no fireplace or woodstove, or design and install a fireplace or woodstove according to the requirements in Table 1. | *LEED for Homes prerequisite partially meets the 2009 IECC requirements. LEED for Homes does not require gasketed doors.* |
| Mandatory | 402.4 Air leakage. 402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. Exceptions: Site-built windows, skylights and doors. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific fenestration sealing requirements.* |
| Mandatory | 402.4 Air leakage. 402.4.5 Recessed lighting. | Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific recessed lighting requirements.* |

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| | | movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | | |
| Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | - | *LEED for Homes requires compliance with ENERGY STAR V2.0 and it does not explicitly mention trade-offs. The 2009 IECC requirement is not met.* |
| Mandatory | 403.1 Controls. 403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system.<br>403.1.1 Programmable thermostat. Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | **EA 6: Space Heating and Cooling Equipment - Prescriptive Path**<br>Prerequisite 6.1 (Mandatory). Good HVAC Design and Installation. Meet each of the following requirements… c) Install ENERGY STAR labeled programmable thermostat (except heat pumps and hydronic systems).<br><br>*Update (1/1/10): To meet EA 6.1(c), programmable thermostats are no longer required to be ENERGY STAR labeled.* | *LEED for Homes prerequisite requires installation of programmable thermostats. Initially programmed set points are not mentioned. The 2009 IECC requirement is partially met.* |
| Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | **EA 6: Space Heating and Cooling Equipment - Prescriptive Path**<br>If a heat pump is installed with a programmable thermostat, the thermostat must be equipped with adaptive recovery. This technology enables the heating equipment to gradually adjust when the thermostat setting changes, preventing overdependence on the less efficient backup heating system. | *LEED for Homes does not require programmable thermostats for heat pumps. However, if a programmable thermostat for a heat pump is installed, it must include adaptive recovery. Adaptive recovery is similar to the 2009 IECC requirements, but can still allow the use of electric-resistance heat when the heat pump meets the load. The 2009 IECC requirement is partially met.* |
| Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6. | **EA 5: Heating and Cooling Distribution System - Prescriptive Path**<br>A. Forced-Air Systems | *LEED for Homes prerequisite does not mention higher insulation levels for supply ducts in attics. The 2009 IECC requirement is partially* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | Exception: Ducts or portions thereof located completely inside the building thermal envelope. | Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…c) use at least R-6 insulation around ducts in unconditioned spaces. | *met.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. | - | *LEED for Homes requires mandatory air leakage testing, but does not mention specific duct sealing requirements.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following:<br>1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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.<br>2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area.<br>Exceptions: Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | **EA 5: Heating and Cooling Distribution System - Prescriptive Path**<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…a) Limit duct air leakage rate to outside the conditioned envelope. The tested duct leakage rate must be <= 4.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system), verified by the energy rater. Testing is waived if the home meets EA 5.3 (b) or (c). | *LEED for Homes prerequisite meets the 2009 IECC requirement.*<br><br>*If a home does not have forced air systems (e.g., hydronic systems), the requirement does not apply.* |
| Mandatory | 403.2 Ducts. 403.2.3 Building cavities. | Building framing cavities shall not be used as supply ducts. | **EA 5: Heating and Cooling Distribution System - Prescriptive Path**<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…b) Do not install ducts in exterior walls unless extra insulation is added to maintain the overall UA for an exterior wall without ducts. Ducts may be run inside interior wall cavities but must be fully ducted (i.e., do not use the | *LEED for Homes prerequisite meets the 2009 IECC requirement.*<br><br>*If a home does not have forced air systems (e.g., hydronic systems), the requirement does not apply.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | | wall cavity as the duct). | |
| Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | **EA 6: Space Heating and Cooling Equipment - Prescriptive Path**<br>Credit 6.3 (Optional). Very High-Efficiency HVAC. Design and install HVAC equipment that is substantially better than the equipment required by the ENERGY STAR Builder Option Package (Table 1). Any piping designed as part of a heat pump system to carry water that is well above (or below) the thermostatic temperature settings in the home must have R-4 insulation or greater. | *Optional - If the LEED for Homes points are achieved, the IECC requirement will be met.* |
| Mandatory | 403.4 Circulating hot water systems. | All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | **EA 7: Water Heating**<br>Credit 7.1 Efficient Hot Water Distribution (Optional - Performance Path)...Select one of the following designs:<br>a) Structured plumbing system...<br>iv. The system must be designed with a push button control in each full bathroom and the kitchen and an automatic pump shut-off.<br>Credit 7.2 Pipe Insulation (Optional - Prescriptive Path). All domestic hot water piping shall have R-4 insulation. Insulation shall be properly installed on all piping elbows to adequately insulate the 90-degree bend. | *Optional - If the LEED for Homes points are achieved, the 2009 IECC requirement will be met.* |
| Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | - | *Not explicitly mentioned in LEED for Homes.* |
| Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | **EA 6: Space Heating and Cooling Equipment - Prescriptive Path**<br>Prerequisite 6.1 (Mandatory). Good HVAC Design and Installation. Meet each of the following requirements:<br>a) Design and size HVAC equipment properly using ACCA Manual J, the ASHRAE 2001 Handbook of Fundamentals, or an equivalent computation procedure.<br>b) Install HVAC equipment that meets the requirements of the ENERGY STAR for Homes national Builder Option Package (Table 1).<br>c) Install ENERGY STAR labeled programmable thermostat (except heat pumps and hydronic systems).<br>Credit 6.2 (Optional). High-Efficiency HVAC. Design and install HVAC equipment that is better than the equipment required by the ENERGY STAR Builder Option Package (Table 1)<br>OR<br>Credit 6.3 (Optional). Very High-Efficiency HVAC. Design and install HVAC equipment that is substantially better than the equipment required by the ENERGY | *Mandatory - LEED for Homes requirement meets the 2009 IECC requirement.*<br><br>*Optional LEED for Homes points go beyond the IECC requirements.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | | STAR Builder Option Package (Table 1). Any piping designed as part of a heat pump system to carry water that is well above (or below) the thermostatic temperature settings in the home must have R-4 insulation or greater. | |
| Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | - | *Commercial requirements are outside of the scope of this analysis.* |
| Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. | - | *Not explicitly mentioned in LEED for Homes.* |
| Mandatory | 403.9 Pools.<br>403.9.1 Pool heaters. | Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.3.<br>403.9.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights. | - | *Not explicitly mentioned in LEED for Homes.* |
| Mandatory | 403.9 Pools.<br>403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.<br>Exceptions:<br>1. Where public health standards require 24-hour pump operation.<br>2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | *Not explicitly mentioned in LEED for Homes.* |
| Mandatory | 403.9 Pools.<br>403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.<br>Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | *Not explicitly mentioned in LEED for Homes.* |
| Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall | **EA 8: Lighting - Prescriptive Path**<br>**Prerequisite 8.1 ENERGY STAR Lights** | *LEED for Homes prerequisite may or may not meet the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | be high-efficacy lamps. | **(Mandatory).** Install at least four ENERGY STAR labeled light fixtures or ENERGY STAR labeled compact fluorescent light bulbs (CFLs) in high-use rooms (kitchen, dining room, living room, family room, hallways).<br>Credit 8.2 Improved Lighting (Optional). Select and install one or both of the following measures:<br>a) Indoor lighting. Install three additional ENERGY STAR labeled light fixtures or ENERGY STAR labeled compact fluorescent light bulbs (CFLs) in high-use rooms.<br>b) Exterior lighting. All exterior lighting must have either motion sensor controls or integrated photovoltaic cells.<br>OR<br>Credit 8.3 Advanced Lighting Package (Optional). Install ENERGY STAR Advanced Lighting Package...consists of a minimum of 60% ENERGY STAR qualified hard-wired fixtures and 100% ENERGY STAR-qualified ceiling fans (if any) OR Install ENERGY STAR labeled lamps in 80% of the fixtures throughout the home. ENERGY STAR labeled CFLs are acceptable. All ceiling fans must be ENERGY STAR labeled. | *If the points under Optional Credit 8.3 are achieved, the IECC requirement will be met.* |
| Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | **EA 5: Heating and Cooling Distribution System - Prescriptive Path**<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…c) use at least R-6 insulation around ducts in unconditioned spaces. | *LEED for Homes prerequisite meets the 2009 IECC requirement.*<br><br>*If a home does not have forced air systems (e.g., hydronic systems), the requirement does not apply.* |
| Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>Exception: The energy use based on source energy expressed in Btu or Btu per square | **EA 1: Optimize Energy Performance - Performance Path**<br>Prerequisite 1.1 Performance of ENERGY STAR for Homes. Meet the performance requirements of ENERGY STAR for homes, including third-party inspections.<br>Credit 1.2 Exceptional Energy Performance. Exceed the performance of ENERGY STAR for Homes.<br><br>*Clarification (1/1/10): The performance requirements of Energy Star for Homes 2006 are published on the EPA website and include: 1) HERS Index of 80 or lower in climate zones 6-8 or HERS Index of 85 or lower in climate zones 1-5; 2) completed Thermal Bypass Inspection Checklist, including slab-edge insulation in* | *ENERGY STAR for Homes requires a HERS index of 85 to 80, depending on the climate zone. IECC 2009 requirements are equivalent to a HERS index of 85 because it is 15% more efficient than the 2006 IECC which would receive a HERS index of 100. However, ENERGY STAR requirements do not fully comply with the 2009 IECC because the allowance for equipment efficiency trade-offs contained in the Performance Path are not allowed in the IECC 2009.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | *climate zones 4+; 3) duct leakage of less than 6 CFM to outdoors per 100 sq. ft.; 4) at least one Energy Star qualified product (heating or cooling equipment; windows; 5 or more labeled light fixtures, appliances, or ventilation fans); 5) indoor and outdoor coils must be matched, in accordance with AHRI standards; 6) adaptive recovery for any programmable thermostats installed in homes with a heat pump; and 7) maximum oversizing limit for air conditioners and heat pumps is 15%, with the exception of heat pumps in Climate Zones 5-8, where maximum oversizing is 25%).* | |
| Performance | 405.4 Documentation. 405.4.1 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. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(1) | The compliance documentation shall include the following information:<br>1. Address or other identification of the residence; | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>Exception: Multiple orientations. When an otherwise identical building model is | - | *Not explicitly mentioned in LEED for Homes.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | | 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. | | |
| Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.5 Calculation procedure. | 405.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>405.5.2 Residence specifications. The standard reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. | Calculation procedures ... and shall include the following capabilities: | - | *Not explicitly mentioned in LEED for Homes.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | LEED for Homes | Comments |
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| | 405.6.1 Minimum capabilities.(2) | 2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | | |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities: 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. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities: 4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. 405.6.2 Specific approval. | Performance analysis tools meeting the applicable sections of Section 405 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | - | *Not explicitly mentioned in LEED for Homes.* |
| Performance | 405.6 Calculation software tools. 405.6.3 Input values. | When calculations require input values not specified by Sections 402, 403, 404 and 405, those input values shall be taken from an approved source. | - | *Not explicitly mentioned in LEED for Homes.* |

# Appendix D

# ENERGY STAR Version 2.0 Mapping

| Requirement Category | IECC Requirement Reference | IECC | ES2 | Comments |
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| Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | **Prescriptive Path**: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Prescriptive - The ENERGY STAR V2 insulation and glazing value portions are lower than the IECC 2009 requirement for all assembly types in all Climate Zones, however, the ENERGY STAR V2 air infiltration rates exceed the IECC 2009 requirement. This results in overall performance exceeding the 2009 IECC requirement.* |
| Prescriptive | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | *See alternative compliance path under 2009 IECC section 402.1.4.* | *ENERGY STAR V2 does not require specific insulation R-values, however it has requirements for total building thermal envelope UA thus it meets the alternative IECC requirement (see below description under Section 402.1.4).* |
| Prescriptive | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, | *Prescriptive Path - ENERGY STAR only meets a portion of the IECC 2009 requirement.* |

| Requirement Category | IECC Requirement Reference | IECC | ES2 | Comments |
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| | | | or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than or equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Prescriptive Path - ENERGY STAR V2 only meets a portion of the IECC 2009 requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be | **(Mandatory) Thermal Bypass Inspection Checklist** 5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory and Prescriptive ENERGY STAR V2 requirements meet the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC | ES2 | Comments |
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| | | deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **Prescriptive Path:** Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings without attic spaces. | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 4-2.1.4. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (*Walls Adjoining Exterior Walls or Unconditioned Spaced).*<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory- ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

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| | | space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.4 Mass walls. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | **(Mandatory) Thermal Bypass Inspection Checklist** Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Mandatory- ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method. Exception: In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame | *Unclear if steel framed calculation process referenced in ENERGY STAR V2 is more or less stringent than what is in the 2009 IECC. Different methods are used for the calculations.* |

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| | | | envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | **(Mandatory) Thermal Bypass Inspection Checklist** 1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaced). 3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compressions. Blown-in insulation is verified to have proper density with firm packing. | *Mandatory- ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 402.1.1 and 402.2.6. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

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| | | | roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | **(Mandatory) Thermal Bypass Inspection Checklist** 1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaced). Only at Climate Zones 4 and Higher: 1.4- Slab-edge insulation (A maximum of 25% of the slab edge may be uninsulated in Climate Zones 4 and 5). **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Mandatory and Prescriptive ENERGY STAR V2 requirements meet the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.9 Crawl space walls. | As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be | *Prescriptive Path: Energy Star V2 requirements meet the 2009 IECC* |

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| | | from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

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| Prescriptive | 402.2 Specific insulation requirements. 402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | **(Mandatory)Thermal Bypass Inspection Checklist** 1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (*Walls Adjoining Exterior Walls or Unconditioned Spaces)*. 2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR Alternate for Climate Zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | *Mandatory- ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | **Prescriptive Path:** Windows must meet or exceed version 4.0 of the Energy Star Program Requirements for Residential Windows, Doors, and Skylights (additional requirements for CZ 2 & 4). | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.2-402.3.3. | 402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements. 402.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4m2) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | **Prescriptive Path:** Windows must meet or exceed version 4.0 of the Energy Star Program Requirements for Residential Windows, Doors, and Skylights (additional requirements for CZ 2 & 4). Refer to the county-level BOPs on EPA's website for the specific window performance levels required in each county of the country. | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 | *Exemption for door area greater than 24 square feet does not comply with the IECC 2009; not all portions of the IECC 2009 requirement are met.* |

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| | | | shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *General guidance - not a unique requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (*Walls Adjoining Exterior Walls or Unconditioned Spaces).*<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |

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| | | | edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (2) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>2. Site-built windows, doors and skylights. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces). | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>3. Openings between window and door assemblies and their respective jambs and framing. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |

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| | | | dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>4. Utility penetrations. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>5. Dropped ceilings or chases adjacent to the thermal envelope. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| | 402.4 Air leakage. 402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>6. Knee walls. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |

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| | 402.4 Air leakage. 402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 7. Walls and ceilings separating a garage from conditioned spaces. | **(Mandatory) Thermal Bypass Inspection Checklist** 2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 8. Behind tubs and showers on exterior walls. | **(Mandatory) Thermal Bypass Inspection Checklist** 2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 9. Common walls between dwelling units. | **(Mandatory) Thermal Bypass Inspection Checklist** 6.0 Common Walls Between Dwelling Units. Gap between drywall shaft wall (i.e., common wall) and the structural framing between units is fully sealed at all exterior boundary conditions. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 10. Attic access openings. | **(Mandatory) Thermal Bypass Inspection Checklist** 2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. 5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 11. Rim joist junction. | **(Mandatory) Thermal Bypass Inspection Checklist** 3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing. | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (12) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: 12. Other sources of infiltration. | **(Mandatory) Thermal Bypass Inspection Checklist** 1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces). | *Mandatory- ENERGY STAR V2 requirement exceeds the 2009 IECC requirement.* |

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| | | | 2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | |
| Mandatory | 402.4 Air leakage. 402.4.2 Air sealing and insulation. 402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.1 Testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.<br>During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide | *Mandatory - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

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| | | backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be turned off;<br>6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | |
| Mandatory | 402.4 Air leakage. 402.4.2 Air sealing and insulation. 402.4.2.2 Visual inspection option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | **(Mandatory) Thermal Bypass Inspection Checklist**<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | *Mandatory - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 402.4 Air leakage. 402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

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| | | 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. Exceptions: Site-built windows, skylights and doors. | IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | |
| Mandatory | 402.4 Air leakage. 402.4.5 Recessed lighting. | Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | **Prescriptive Path:** The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC | ES2 | Comments |
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| | | | defined in the RESNET Standards by a RESNET-certified rater. | |
| Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 403.1 Controls. 403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system.<br>403.1.1 Programmable thermostat. Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | **Prescriptive Path:** Energy Star qualified thermostat (except for zones with radiant heat). | *Prescriptive - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.<br>Exception: Ducts or portions thereof located completely inside the building thermal envelope. | **(Mandatory) Thermal Bypass Inspection Checklist** 4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required). Performance Path: Leakage must be ≤ 6 cfm outdoors / 100 sq. ft. Prescriptive Path Leakage: ≤ 4 cfm to outdoors / 100 sq. ft. ; and R-6 min. insulation on ducts in unconditioned spaces. | *Mandatory and Prescriptive ENERGY STAR V2 requirements meet the 2009 IECC requirements. Performance - Unknown as to whether it meets the 2009 IECC requirement.* |

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| Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. | **(Mandatory) Thermal Bypass Inspection Checklist** 4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required). | *Mandatory - ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following:<br>1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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.<br>2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area.<br>Exceptions: Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | **Performance Path:** Ducts must be sealed and tested to be ≤ 6 cfm outdoors / 100 sq. ft of conditioned floor area, as determined and documented by a RESNET-certified rater using a RESNET- approved testing protocol. If total duct leakage is ≤ 6 cfm to outdoors / 100 sq. ft. of conditioned floor area, then leakage to outdoors does not need to be tested. Duct leakage testing can be waived if all ducts and air handling equipment are located in conditioned space (i.e., within the home's air and thermal barriers) AND the envelope leakage has been tested to be ≤3 ACH50 of ≤ 0.25 CFM 50 per sq. ft. of the building envelope. Note that mechanical ventilation will be required in this situation.<br>**Prescriptive Path:** Leakage: ≤ 4 cfm to outdoors / 100 sq. ft. ; and R-6 min. insulation on ducts in unconditioned spaces. | *Performance and Prescriptive ENERGY STAR V2 requirements exceed the 2009 IECC requirements.* |
| Mandatory | 403.2 Ducts. 403.2.3 Building cavities. | Building framing cavities shall not be used as supply ducts. | EPA recommends, but does not require, locating ducts within the home's conditioned space (i.e., inside the air and thermal barriers), and using a minimum of R-4 insulation for ducts inside the conditioned space to prevent condensation. | *ENERGY STAR V2 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 403.4 Circulating hot water | All circulating service hot water piping shall be insulated to at least R-2. | **(Mandatory)** 1.0 Where requirements of the local codes, manufacturers' installation instructions, | *If the IECC 2009 has been adopted the ENERGY STAR V2 requirement meets the 2009 IECC* |

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| | systems. | Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:<br>a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met; | *requirement. If not adopted then there is only partial credit.* |
| Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | **(Mandatory)** 1.0 Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:<br>a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met; | *If the IECC 2009 has been adopted the ENERGY STAR V2 requirement meets the 2009 IECC requirement. If not adopted then there is only partial credit.* |
| Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | **(Mandatory)** 3.0 Cooling equipment shall be sized according to the latest editions of ACCA Manuals J and S, ASHRAE 2001 Handbook of Fundamentals, or an equivalent procedure. Maximum oversizing limit for air conditioners and heat pumps is 15% (with the exception of heat pumps in Climate Zones 5 - 8, where the maximum oversizing limit is 25%). The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater: Outdoor temperatures shall be the 99.0% and 1.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available; Indoor temperatures shall be 75 F for cooling and 70 F for heating; Infiltration rate shall be selected as "tight", or the equivalent term.<br>In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards. | *ENERGY STAR V2 requirement only pertains to the cooling loads. The 2009 IECC requirement is only partially met.* |
| Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | - | *Commercial requirements are outside of the scope of this analysis.* |
| Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 403.9 Pools. | Pools shall be provided with energy- | - | *Not explicitly mentioned in ENERGY STAR V2.* |

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| | 403.9.1 Pool heaters. | conserving measures in accordance with Sections 403.9.1 through 403.9.3.<br>403.9.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights. | | |
| Mandatory | 403.9 Pools.<br>403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.<br>Exceptions:<br>1. Where public health standards require 24-hour pump operation.<br>2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Mandatory | 403.9 Pools.<br>403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.<br>Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. | **Prescriptive Path:** Five or more Energy Star qualified appliances, light fixtures, ceiling fans equipped with lighting fixtures, water heaters, and/or ventilation fans must be installed. Any combination of Energy Star qualified products listed may be installed to meet this requirement.... Energy Star qualified lighting fixtures installed in the following locations shall not be counted: storage rooms (e.g., closets, pantries, sheds), or garages. | *Prescriptive- ENERGY STAR V2 requirement meets the 2009 IECC requirement only if over 50% of the light fixtures selected are high efficacy lights.* |
| Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the | Compliance based on using a performance approach to meet a HERS Index of 80 in Climate Zones 6 - 8 and an 85 in Climate Zones 1 - 5. | *Performance - ENERGY STAR V2 requirement does not fully meet the 2009 IECC requirement. Note that the allowance for equipment efficiency trade-offs contained in the Performance Path are not allowed in the IECC 2009.* |

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| | | standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | | |
| Performance | 405.4 Documentation. 405.4.1 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. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(1) | The compliance documentation shall include the following information:<br>1. Address or other identification of the residence; | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | - | *Not explicitly mentioned in ENERGY STAR V2.* |

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| Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>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. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.5 Calculation procedure. | 405.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>405.5.2 Residence specifications. The standard reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for | - | *Not explicitly mentioned in ENERGY STAR V2.* |

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| | | the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | | |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(2) | Calculation procedures ... and shall include the following capabilities:<br>2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities:<br>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. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities:<br>4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.2 Specific approval. | Performance analysis tools meeting the applicable sections of Section 405 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | - | *Not explicitly mentioned in ENERGY STAR V2.* |
| Performance | 405.6 Calculation software tools. 405.6.3 Input values. | When calculations require input values not specified by Sections 402, 403, 404 and 405, those input values shall be taken from an approved source. | - | *Not explicitly mentioned in ENERGY STAR V2.* |

# Appendix E

# ENERGY STAR Version 2.5 Mapping

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| Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br>2.0 Quality-Installed Insulation<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>2.2 All ceiling, wall, floor, and slab insulation shall achieve RESNET- defined Grade I installation, or alternatively, Grade II for surfaces with insulated sheathing.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated will not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | **(Recommended) Program Requirements**<br>**6.0** Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |

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| | | | the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than or equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | **(Recommended) Program Requirements**<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |

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| | | | insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. | |
| Prescriptive | 402.2 Specific insulation requirements.<br>402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in D) are used.<br>D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non-fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. Note that fenestration products (i.e., windows, skylights, doors) shall not be included in this calculation. Also, not that while ceiling and slab insulation can be included in trade-off calculations, the R-value must meet or exceed the minimum values listed in items 4.1 through 4.3 of the checklist to provide an effective thermal break, regardless of the UA tradeoffs calculated. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |

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| | | | 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings without attic spaces. | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 4-2.1.4. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings without attic spaces,R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exception shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in D) are used.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation. 2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. 5.0 Air Sealing 5.3 Other Openings 5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥ R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.4 Mass walls. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected,* |

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| | | | 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements.<br>402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method. Exception: In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC- Table 402.1.1. The following exceptions apply. A) Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC - Table 402.2.5. In climate zones 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in D) apply. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non0fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. ... The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |

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| | | | uninsulated in 2009 IECC Climate Zones 4 and 5. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 402.1.1 and 402.2.6. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements**: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or* |

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| | | Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements.<br>402.2.9 Crawl space walls. | As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0- Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements.<br>402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System*<br>*All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify.* |

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| | | | | *Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| Prescriptive | 402.2 Specific insulation requirements.<br>402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>**V2.5 Program Requirements:** The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.*<br>*Also note: The allowance for 25% of the slab edge to be uninsulated with not comply with the prescriptive requirements of the code as there is no allowance for the installation of partial insulation.* |
| | 402.3 Fenestration.<br>402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| | 402.3 Fenestration.<br>402.3.2-402.3.3. | 402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements.<br>402.3.3 Glazed fenestration exemption. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must* |

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| | | Up to 15 square feet (1.4m2) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Prescriptive | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Prescriptive | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air* |

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| | | | www.energystar.gov/windows. | *Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *General guidance - not a unique requirement.* |
| | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (2) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>2. Site-built windows, doors and skylights. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>3. Openings between window and door assemblies and their respective jambs and framing. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>4. Utility penetrations. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam. | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>5. Dropped ceilings or chases adjacent to the thermal envelope. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.3 Ceilings<br>3.3.1 Dropped ceiling/soffit below unconditioned attic. | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones;* |

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| | | | | *also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>6. Knee walls. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.3 Attic knee walls / sloped attics | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>7. Walls and ceilings separating a garage from conditioned spaces. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space.<br>3.2 Floors<br>3.2.1 Floor above garage<br>3.3 Ceilings<br>3.3.3 All other ceilings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |

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| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>8. Behind tubs and showers on exterior walls. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.1 Walls behind showers and tubs<br>3.1.9 All other exterior walls | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>9. Common walls between dwelling units. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.7 Double walls<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed<br>5.2.7 In multi-family buildings, the gap between the drywall shaft wall (i.e. common wall) and the structural framing between units fully sealed at all exterior boundary conditions. | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>10. Attic access openings. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.3 Other Ceilings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic. | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>11. Rim joist junction. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers: At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |

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| | | | vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space | |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope.<br>(12) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>12. Other sources of infiltration. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.1 Testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>2.10 HVAC Infiltration rates shall be less than or equal to the following values:<br>6 ACH50 in CZs 1,2<br>5 ACH50 in CZs 3,4<br>4 ACH50 in CZs 5,6,7<br>3 ACH50 in CZ 8 | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |

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| | | turned off;<br>6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | | |
| Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.2 Visual inspection option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>3. Fully-Aligned Air Barriers<br>5. Air Sealing<br>5.3 Other Openings | *Mandatory - ENERGY STAR V2.5 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | - | *Not explicitly mentioned in ENERGY STAR V2.5.* |
| Mandatory | 402.4 Air leakage.<br>402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. Exceptions: Site-built windows, skylights and doors. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Mandatory | 402.4 Air leakage.<br>402.4.5 Recessed lighting. | Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1.5 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and fully gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to ≥R-10 in climate zone 4 and higher to minimize condensation potential. | *Mandatory - ENERGY STAR V2.5 requirement meets the 2009 IECC requirements.* |

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| | | between the housing and the interior wall or ceiling covering. | | |
| Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | **(Recommended) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Optional - Energy Star V2.5 requirement does not meet the 2009 IECC requirements unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – Thermal Enclosure System. All items on this inspection checklist shall be completed (i.e., the rater must indicate whether each item must be corrected, whether the item is builder or rater approved, or whether the item is not applicable to the home). Homes shall pass all requirements of 'Section 3: Fully-Aligned Air Barriers' and 'Section 5: Air Sealing' to qualify. Noncompliance with items in other sections of this checklist shall not prevent homes from earning the label.* |
| Mandatory | 403.1 Controls. 403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system.<br>403.1.1 Programmable thermostat. Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | **(Recommended) National Program Requirements**<br>Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual thermostat is allowed | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | **(Recommended) HVAC System Quality Installation Contractor Checklist**<br>18. For homes with heat pumps, the thermostat shall have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6. | **(Recommended) HVAC System Quality Installation Contractor Checklist**<br>3.0 Duct insulation- Applies to all heating, cooling, | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program* |

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| | | Exception: Ducts or portions thereof located completely inside the building thermal envelope. | supply ventilation, and pressure balancing ducts. 3.1 All connections to trunk ducts in unconditioned space are insulated. 3.2 Prescriptive Path: Supply ducts in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned space have insulation ≥ R- 6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-**6.** | *requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. | **(Mandatory) Program V2.5 Requirements:** Duct leakage to outdoors is maintained at the v2 levels and shall not exceed the following limits: o 4 CFM / 100 sq ft of conditioned floor area for the prescriptive path o 6 CFM / 100 sq ft of conditioned floor area for the performance path No limit on total duct leakage is imposed. | *Mandatory - ENERGY STAR V2.5 requirement meets the 2009 IECC requirement.. While this provision does not explicitly call out the type of duct sealant to use it will be almost impossible to get duct work this tight w/o the use of proper sealant methods. Also, this code requirement has been in the states for several years so if ENERGY STAR doesn't require sealing the IRC does.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following: 1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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 (169.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area. Exceptions: Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | **(Mandatory) Program V2.5 Requirements:** Duct leakage to outdoors is maintained at the v2 levels and shall not exceed the following limits: o 4 CFM / 100 sq ft of conditioned floor area for the prescriptive path o 6 CFM / 100 sq ft of conditioned floor area for the performance path No limit on total duct leakage is imposed. | *Mandatory - ENERGY STAR V2.5 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.2 Ducts. 403.2.3 | Building framing cavities shall not be | **(Recommended) HVAC System Quality** | *Optional - ENERGY STAR V2.5 requirement does* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
|---|---|---|---|---|
| | Building cavities. | used as supply ducts. | **Installation Contractor Checklist**<br>2.0 Duct Quality Installation- Applies to all heating, cooling, ventilation, exhaust, and pressure balancing ducts. 2.5 Building cavities not used as supply or return ducts unless they meet items 3.2, 3.3, 4.1, and 4.2 of this checklist.<br>3.2 Prescriptive Path: Supply duct in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned attic space have insulation ≥ R-6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥R-6. 4.1 Total Rater- measured duct leakage ≤ 6 CFM25 per 100 sq. ft. of conditioned floor area. 4.2 Rater-measured duct leakage to outdoors ≤4 CFM25 per 100 sq. ft. of conditioned floor area. | *not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Mandatory | 403.4 Circulating hot water systems. | All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | **(Recommended) HVAC System Quality Installation Contractor Checklist**<br>1.0 Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manuals J, S, and D, respectively, ASHRAE 2009 Handbook of Fundamentals, or a substantively equivalent procedure. | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | - | *Commercial requirements are outside of the scope of this analysis.* |
| Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
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| | | no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. | | |
| Mandatory | 403.9 Pools. 403.9.1 Pool heaters. | Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.3. 403.9.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Mandatory | 403.9 Pools. 403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps. Exceptions: 1. Where public health standards require 24-hour pump operation. 2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Mandatory | 403.9 Pools. 403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12. Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. | **Prescriptive Path**: Energy Star qualified CFLs or pin-based lighting in 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be installed. (Alternate: Energy Star Advanced Lighting Package). | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | **(Recommended) HVAC System Quality Installation Contractor Checklist** 3.0 Duct insulation 3.1 All connections to trunk ducts in unconditioned space are insulated. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6 | *Optional - ENERGY STAR V2.5 requirement does not meet the 2009 IECC requirement unless the feature is complied with. Note V2.5 Program requirements: Inspection Checklist – HVAC System Quality Installation for Contractors. All items on this inspection checklist shall be* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
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| | | | | *completed. However, noncompliance with items will not prevent homes from earning the label.* |
| Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | **National Program Requirements. Performance Path:**<br>1.0 Determine the ENERGY STAR HERS Index Target, which is the highest numerical HERS index value that each rated home may achieve to earn the ENERGY STAR. This target shall be specifically determined for each rated home by following the steps outlined in the document titled, "ENERGY STAR HERS Index Target Procedure, Version 3 (Rev. 02)", available on EPA"s Web site. This procedure defines how to configure the ENERGY STAR Reference Design Home and calculate its associated HERS index value and then how to apply the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Note that EPA will provide modified Mandatory Requirements and ENERGY STAR Reference Design specifications for states with energy codes significantly more rigorous than the 2009 IECC. Once published, these modified specifications shall be used after a specified transition period, typically 60 days, to determine the ENERGY STAR HERS Index Target in these states. Note that this process shall be completed manually by a Rater until a version of the RESNET-accredited software program used by the Rater becomes available that automatically configures the ENERGY STAR Reference Design, calculates its associated HERS index value, and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon release of such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version. 2. Using the same RESNET-accredited Home Energy Rating software program, configure the preferred set of energy measures for the rated home and verify that the resulting HERS Index meets or exceeds the ENERGY STAR HERS Index Target, as determined in Step 1. Note that, regardless of the measures selected, Mandatory Requirements for All Qualified Homes in Exhibit 2 are also required. Also note that items 1.2 and 2.1 of the Thermal Enclosure System Rater checklist require that all insulation, windows, doors, and skylights meet or exceed 2009 IECC requirements. | *Performance Path: ENERGY STAR V2.5 requirement does not fully comply with the 2009 IECC requirement. Note that the allowance for equipment efficiency trade-offs contained in the Performance Path are not allowed in the IECC 2009.* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
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| Performance | 405.4 Documentation. 405.4.1 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. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(1) | The compliance documentation shall include the following information:<br>1. Address or other identification of the residence; | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>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. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
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| | | characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | | |
| Performance | 405.5 Calculation procedure. | 405.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>405.5.2 Residence specifications. The standard reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools.<br>405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools.<br>405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools.<br>405.6.1 Minimum capabilities.(2) | Calculation procedures ... and shall include the following capabilities:<br>2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools.<br>405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities:<br>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 | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |

| Requirement Category | Requirement Reference | IECC 2009 | ES2.5 | Comments |
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| | | climate and equipment sizing. | | |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities: 4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools. 405.6.2 Specific approval. | Performance analysis tools meeting the applicable sections of Section 405 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |
| Performance | 405.6 Calculation software tools. 405.6.3 Input values. | When calculations require input values not specified by Sections 402, 403, 404 and 405, those input values shall be taken from an approved source. | - | *Not explicitly mentioned in ENERGY STAR 2.5.* |

# Appendix F

# ENERGY STAR Version 3.0 Mapping

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
|---|---|---|---|---|
| Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>**1.1 Prescriptive Path**: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br>2.0 Quality-Installed Insulation<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>2.2 All ceiling, wall, floor, and slab insulation shall achieve RESNET- defined Grade I installation, or alternatively, Grade II for surfaces with insulated sheathing.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path**: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |
| Prescriptive | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | **(Mandatory) Program Requirements**<br>**6.0** Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | | the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows:<br>An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. | |
| Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than of equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | **(Mandatory) Program Requirements**<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24” on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This | *Mandatory ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | | exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in D) are used. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non-fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. Note that fenestration products (i.e., windows, skylights, doors) shall not be included in this calculation. Also, not that while ceiling and slab insulation can be included in trade-off calculations, the R-value must meet or exceed the minimum values listed in items 4.1 through 4.3 of the checklist to provide an effective thermal break, regardless of the UA tradeoffs calculated. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | without attic spaces. | sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 4-2.1.4. | 2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings without attic spaces,R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exception shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in D) are used. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. 5.0 Air Sealing<br>5.3 Other Openings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥ R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.4 Mass walls. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>Exception: In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC- Table 402.1.1. The following exceptions apply. A) Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC - Table 402.2.5. In climate zones 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
|---|---|---|---|---|
| | | | alternative calculations in D) apply. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all nonfenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. ... The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method. | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in accordance with Sections 402.1.1 and 402.2.6. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

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| | | The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | | |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.9 Crawl space walls. | As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.2 Specific insulation requirements. 402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path**: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |

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| | | | Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | |
| Prescriptive | 402.3 Fenestration. 402.3.2-402.3.3. | 402.3.2 Glazed fenestration SHGC. An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements. 402.3.3 Glazed fenestration exemption. Up to 15 square feet (1.4m2) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path**: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path** : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path** : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |
| Prescriptive | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and SHGC in Table 402.1.1. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path**: Fenestration shall meet or exceed 2009 IECC requirements. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |

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| | | | *ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | *General guidance - not a unique requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (2) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>2. Site-built windows, doors and skylights. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>3. Openings between window and door assemblies and their respective jambs and framing. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>4. Utility penetrations. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam. | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>5. Dropped ceilings or chases adjacent to the thermal envelope. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.3 Ceilings<br>3.3.1 Dropped ceiling/soffit below unconditioned attic. | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones;* |

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| | | | | *also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>6. Knee walls. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.3 Attic knee walls / sloped attics | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>7. Walls and ceilings separating a garage from conditioned spaces. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space.<br>3.2 Floors<br>3.2.1 Floor above garage<br>3.3 Ceilings<br>3.3.3 All other ceilings | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>8. Behind tubs and showers on exterior walls. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.1 Walls behind showers and tubs<br>3.1.9 All other exterior walls | *Mandatory - ENERGY STAR V3 requirement exceed the 2009 IECC requirements.*<br><br>*At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>9. Common walls between dwelling units. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.7 Double walls<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed<br>5.2.7 In multi-family buildings, the gap between the drywall shaft wall (i.e. common wall) and the structural framing between units fully sealed at all exterior boundary conditions. | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>10. Attic access openings. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.3 Other Ceilings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic. | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>11. Rim joist junction. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>3.0 Fully-Aligned Air Barriers: At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |

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| | | | insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space | |
| Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (12) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>12. Other sources of infiltration. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | *Mandatory - ENERGY STAR V3 requirement exceeds the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation. 402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>402.4.2.1 Testing option. Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances.<br>During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be turned off; | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>**2.10 HVAC** Infiltration rates shall be less than or equal to the following values:<br>6 ACH50 in CZs 1,2<br>5 ACH50 in CZs 3,4<br>4 ACH50 in CZs 5,6,7<br>3 ACH50 in CZ 8 | *Mandatory - ENERGY STAR V3 exceeds the requirement of the 2009 IECC because the recommended ACH is less than that in the IECC. Note although included in the checklist for V3, failure to meet the required level does not prohibit the home from earning the label.* |

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| | | 6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | | |
| Mandatory | 402.4 Air leakage. 402.4.2 Air sealing and insulation. 402.4.2.2 Visual inspection option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2: 402.4.2.2 Visual inspection option. Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>3. Fully-Aligned Air Barriers<br>5. Air Sealing<br>5.3 Other Openings | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 402.4 Air leakage. 402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer.<br>Exceptions: Site-built windows, skylights and doors. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 **Performance Path** : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |
| Mandatory | 402.4 Air leakage. 402.4.5 Recessed lighting. | Recessed luminaires installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>5.0 Air Sealing<br>5.1.5 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and fully gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to ≥R-10 in climate zone 4 and higher to minimize condensation potential. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 | **(Mandatory) Thermal Enclosure System Rater Checklist**<br>1.0 High-Performance Fenestration<br>1.1 **Prescriptive Path:** Fenestration shall meet or | *Prescriptive and Performance ENERGY STAR V3 requirements meet or exceed the 2009 IECC requirement.* |

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| | | through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | exceed ENERGY STAR* requirements.<br>1.2 **Performance Path**: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | |
| Mandatory | 403.1 Controls. 403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system. 403.1.1 Programmable thermostat. Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | **(Mandatory) National Program Requirements**<br>Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual thermostat is allowed. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>18. For homes with heat pumps, the thermostat shall have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.<br>Exception: Ducts or portions thereof located completely inside the building thermal envelope. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>3.0 Duct insulation- Applies to all heating, cooling, supply ventilation, and pressure balancing ducts.<br>3.1 All connections to trunk ducts in unconditioned space are insulated.<br>3.2 Prescriptive Path: Supply ducts in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned space have insulation ≥ R- 6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-**6.** | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with | **(Mandatory)** 14. For all homes that have less than 1,200 sq ft of conditioned floor area (CFA), total measured duct leakage shall be < 8 CFM25 | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

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| | | Section M1601.4.1 of the International Residential Code. | per 100 sq. ft. of CFA and measured duct leakage to outdoors shall be < 5 CFM25 per 100 sq. ft. of CFA.<br>15. If total duct leakage is < 4 CFM25 per 100 sq. ft. of conditioned floor area, or < 5 CFM25 per 100 sq. ft. of conditioned floor area for homes that have less than 1,200 sq. ft. of conditioned floor area, then leakage to outdoors need not be tested. | |
| Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following:<br>1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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.<br>2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area.<br>Exceptions: Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | **(Mandatory)** 14. For all homes that have less than 1,200 sq ft of conditioned floor area (CFA), total measured duct leakage shall be < 8 CFM25 per 100 sq. ft. of CFA and measured duct leakage to outdoors shall be < 5 CFM25 per 100 sq. ft. of CFA.<br>15. If total duct leakage is < 4 CFM25 per 100 sq. ft. of conditioned floor area, or < 5 CFM25 per 100 sq. ft. of conditioned floor area for homes that have less than 1,200 sq. ft. of conditioned floor area, then leakage to outdoors need not be tested. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.2 Ducts. 403.2.3 Building cavities. | Building framing cavities shall not be used as supply ducts. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>2.0 Duct Quality Installation- Applies to all heating, cooling, ventilation, exhaust, and pressure balancing ducts. 2.5 Building cavities not used as supply or return ducts unless they meet items 3.2, 3.3, 4.1, and 4.2 of this checklist.<br>3.2 **Prescriptive Path**: Supply duct in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned attic space have insulation ≥ R-6. 3.3 All other | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | | supply ducts and all return ducts in unconditioned space have insulation ≥R-6. 4.1 Total Rater-measured duct leakage ≤ 6 CFM25 per 100 sq. ft. of conditioned floor area. 4.2 Rater-measured duct leakage to outdoors ≤4 CFM25 per 100 sq. ft. of conditioned floor area. | |
| Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 403.4 Circulating hot water systems. | All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | **(Mandatory) HVAC System Quality Installation Contractor Checklist** 1.0 Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manuals J, S, and D, respectively, ASHRAE 2009 Handbook of Fundamentals, or a substantively equivalent procedure. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | - | *Commercial requirements are outside of the scope of this analysis.* |
| Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 403.9 Pools. 403.9.1 Pool heaters. | Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.3. 403.9.1 Pool heaters. All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not | - | *Not explicitly mentioned in ENERGY STAR V3.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | have continuously burning pilot lights. | | |
| Mandatory | 403.9 Pools. 403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps.<br>Exceptions:<br>1. Where public health standards require 24-hour pump operation.<br>2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Mandatory | 403.9 Pools. 403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12.<br>Exception: Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. | **Prescriptive Path**: ENERGY STAR qualified CFLs or pin-based lighting in 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be installed. (Alternate: ENERGY STAR Advanced Lighting Package). | *Prescriptive Path: ENERGY STAR V3 requirement meets the 2009 IECC requirement. Performance Path: ENERGY STAR V3 requirement does not meet the 2009 IECC requirement.* |
| Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | **(Mandatory) HVAC System Quality Installation Contractor Checklist**<br>3.0 Duct insulation<br>3.1 All connections to trunk ducts in unconditioned space are insulated.<br>3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6. | *Mandatory - ENERGY STAR V3 requirement meets the 2009 IECC requirement.* |
| Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>Exception: The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be | **National Program Requirements. Performance Path**<br>1.0 Determine the ENERGY STAR HERS Index Target, which is the highest numerical HERS index value that each rated home may achieve to earn the ENERGY STAR. This target shall be specifically determined for each rated home by following the steps outlined in the document titled, "ENERGY STAR HERS Index Target Procedure, Version 3 (Rev. 02)", available on EPA‟s Web site. This procedure defines how to configure the ENERGY STAR Reference Design Home and calculate its associated HERS index value and then how to apply the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Note that EPA will | *Performance Path: ENERGY STAR V3 requirement does not fully comply with the 2009 IECC. Note that the allowance for equipment efficiency trade-offs contained in the Performance Path are not allowed in the IECC 2009.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | provide modified Mandatory Requirements and ENERGY STAR Reference Design specifications for states with energy codes significantly more rigorous than the 2009 IECC. Once published, these modified specifications shall be used after a specified transition period, typically 60 days, to determine the ENERGY STAR HERS Index Target in these states. Note that this process shall be completed manually by a Rater until a version of the RESNET-accredited software program used by the Rater becomes available that automatically configures the ENERGY STAR Reference Design, calculates its associated HERS index value, and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon release of such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version. 2. Using the same RESNET-accredited Home Energy Rating software program, configure the preferred set of energy measures for the rated home and verify that the resulting HERS Index meets or exceeds the ENERGY STAR HERS Index Target, as determined in Step 1. Note that, regardless of the measures selected, Mandatory Requirements for All Qualified Homes in Exhibit 2 are also required. Also note that items 1.2 and 2.1 of the Thermal Enclosure System Rater checklist require that all insulation, windows, doors, and skylights meet or exceed 2009 IECC requirements. | |
| Performance | 405.4 Documentation. 405.4.1 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. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(1) | The compliance documentation shall include the following information:<br>1. Address or other identification of the residence; | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). | - | *Not explicitly mentioned in ENERGY STAR V3.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | | |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>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. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.5 Calculation procedure. | 405.5.1 General. Except as specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>405.5.2 Residence specifications. The standard reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of | - | *Not explicitly mentioned in ENERGY STAR V3.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | | all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | | |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(2) | Calculation procedures ... and shall include the following capabilities:<br>2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities:<br>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. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities:<br>4. Printed code official inspection checklist listing each of the proposed design component characteristics from Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.2 Specific approval. | Performance analysis tools meeting the applicable sections of Section 405 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | - | *Not explicitly mentioned in ENERGY STAR V3.* |
| Performance | 405.6 Calculation software tools. 405.6.3 | When calculations require input values not specified by Sections 402, 403, 404 and 405, | - | *Not explicitly mentioned in ENERGY STAR V3.* |

| Requirement Category | IECC Requirement Reference | IECC 2009 | ES3 | Comments |
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| | Input values. | those input values shall be taken from an approved source. | | |

# Appendix G

# Comprehensive Comparison

| Category | Topic | Requirement category | IECC Requirement Reference | IECC 2009 | ICC-700 | LEED for Homes | ES2 | ES2.5 | ES3 |
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| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.1.1 Insulation and fenestration criteria. | The building thermal envelope shall meet the requirements of Table 402.1.1 based on the climate zone specified in Chapter 3. | See alternative compliance path under 2009 IECC section 402.1.4. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code.<br>EA 4: Windows - Prescriptive Path<br>Prerequisite 4.1 Good Windows (Mandatory). Meet all of the following requirements…design and install windows and glass doors that have NFRC ratings that meet or exceed the window requirements of the ENERGY STAR for Homes national Builder Option Package (Table 1).<br>Credit 4.2 Enhanced Windows (Optional). Design and install windows and glass doors...that exceed...Table 1.<br>OR<br>Credit 4.3 Exceptional Windows (Optional). Design and install windows and glass doors...that substantially exceed...Table 1. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br>2.0 Quality-Installed Insulation<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>2.2 All ceiling, wall, floor, and slab insulation shall achieve RESNET-defined Grade I installation, or alternatively, Grade II for surfaces with insulated sheathing.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br>2.0 Quality-Installed Insulation<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>2.2 All ceiling, wall, floor, and slab insulation shall achieve RESNET-defined Grade I installation, or alternatively, Grade II for surfaces with insulated sheathing.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.1.2 R-value computation. | Insulation material used in layers, such as framing cavity insulation and insulating sheathing, shall be summed to compute the component R-value. The manufacturer's settled R-value shall be used for blown insulation. Computed R-values shall not include an R-value for other building materials or air films. | See alternative compliance path under 2009 IECC section 402.1.4. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | See alternative compliance path under 2009 IECC section 402.1.4. | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.1.3 U-factor alternative. | An assembly with a U-factor equal to or less than that specified in Table 402.1.3 shall be permitted as an alternative to the R-value in Table 402.1.1. | See alternative compliance path under 2009 IECC section 402.1.4. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of | (Recommended) Program Requirements<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be | (Mandatory) Program Requirements<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The<br>following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements |

| Category | Topic | Requirement category | IECC Requirement Reference | IECC 2009 | ICC-700 | LEED for Homes | ES2 | ES2.5 | ES3 |
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| | | | | | | | the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows:<br>An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.1.4 Total UA alternative. | If the total building thermal envelope UA... is less than or equal to the total UA resulting from using the U-factors in Table 402.1.3…., the building shall be considered in compliance with Table 402.1.1. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The SHGC requirements shall be met in addition to the UA compliance. | 703.1 Building Envelope<br>703.l.1 (Optional, Prescriptive path) Where the total building thermal envelope UA is less than required by the 2006 IECC Section 402.1.4, the total building thermal envelope UA is in accordance with Table 703.1.1. Where insulation is used to achieve these percentages, a third-party grading of the installation as achieving Grade 1 is required. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a | (Recommended) Program Requirements<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption | (Mandatory) Program Requirements<br>6.0 Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC - Table 402.1.1. The following exceptions apply:<br>a. Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC – Table 402.2.5. In CZ 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in d) are used;<br>b. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at |

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| | | | | | | | series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. | the eaves. This exemption shall not apply if the alternative calculations in d) are used;<br>c. For ceilings without attic spaces, R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exemption shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in d) are used;<br>d. An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.1 Ceilings with attic spaces. | When Section 402.1.1 would require R-38 in the ceiling, R-30 shall be deemed to satisfy the requirement for R-38 whenever the full height of uncompressed R-30 insulation extends over the wall top plate at the eaves. Similarly, R-38 shall be deemed to satisfy the requirements for R-49 where ever the full height of uncompressed R-38 insulation extends over the top plate at the eaves. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | See alternative compliance path under 2009 IECC section 402.1.4. | EA 2: Insulation - Prescriptive Path Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory) Thermal Bypass Inspection Checklist<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed.<br>Prescriptive Path: Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in D) are used. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non-fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. Note that fenestration products (i.e., windows, skylights, doors) shall not be included in this calculation. Also, not that while ceiling and slab insulation can be included in trade-off calculations, the R-value must meet or exceed the minimum values listed in items 4.1 through 4.3 of the checklist to provide an effective thermal break, regardless of the UA | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings with attic spaces, R-30 shall satisfy the requirement for R-38 and R-38 shall satisfy the requirement for R-49 wherever the full height of uncompressed insulation at the lower R-value extends over the wall top plate at the eaves. This exemption shall not apply if the alternative calculations in D) are used. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non-fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. Note that fenestration products (i.e., windows, skylights, doors) shall not be included in this calculation. Also, not that while ceiling and slab insulation can be included in trade-off calculations, the R-value must meet or exceed the minimum |

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| | | | | | | | | tradeoffs calculated. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | values listed in items 4.1 through 4.3 of the checklist to provide an effective thermal break, regardless of the UA tradeoffs calculated. The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.2 Ceilings without attic spaces. | Where Section 402.1.1 would require insulation levels above R-30 and the design often roof/ceiling assemble does not allow sufficient space for the required insulation, the minimum required insulation for such roof/ceiling assemblies shall be R-30. This reduction of insulation from the requirements of Section 402.1.1 shall be limited to 500 square feet of 20 percent of the total insulated ceiling area, whichever is less. This reduction shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 4-2.1.4. | See alternative compliance path under 2009 IECC section 402.1.4. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings without attic spaces,R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exception shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in D) are used.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. For ceilings without attic spaces,R-30 shall satisfy the requirement for any required value above R-30 if the design of the roof/ceiling assembly does not provide sufficient space for the required insulation value. This exception shall be limited to 500 square ft. or 20% of the total insulated ceiling area, whichever is less. This exemption shall not apply if the alternative calculations in D) are used. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.3 Access hatches and doors. | Access doors from conditioned spaces to unconditioned spaces (e.g., attics and crawl spaces) shall be weatherstripped and insulated to a level equivalent to the insulation on the surrounding surfaces. Access shall be provided to all equipment that prevents damaging or compressing the insulation. A wood framed or equivalent baffle or retainer is required to be provided when loose fill | Section 701.4.3.4 Ceilings and attics. (1) Attic Access (except unvented attics). (Mandatory)<br>Attic access, knee wall door, or drop-down stair is covered with insulation and gasketed. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaced).<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation. 2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. 5.0 Air Sealing 5.3 Other Openings 5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥ R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic.<br>V2.5 Program Requirements: The | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. 5.0 Air Sealing<br>5.3 Other Openings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥ R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when |

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| | | | | insulation is installed, the purpose of which is to prevent the loose fill insulation from spilling into the living space when the attic access is opened, and to provide a permanent means of maintaining the installed R-value of the loose fill insulation. | | | caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | occupant is not accessing the attic. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.4 Mass walls. | Mass walls for the purposes of this chapter shall be considered above-grade walls of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick (other than brick veneer), earth (adobe, compressed earth block, rammed earth) and solid timber/logs. | Section 202 - Definitions<br>Mass Walls. Walls constructed of concrete block, concrete, insulated concrete form (ICF), masonry cavity, brick, earth (adobe, compressed earth block, rammed earth), and/or solid timber/logs, with a minimum of 50 percent of the required R-value on the exterior of the wall. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory) Thermal Bypass Inspection Checklist<br>Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.5 Steel-frame ceilings, walls, and floors. | Steel-frame ceilings, walls and floors shall meet the insulation requirements of Table 402.2.5 or shall meet the U-factor requirements in Table 402.1.3. The calculation of the U-factor for a steel-frame envelope assembly shall use a series-parallel path calculation method. **Exception:** In Climate Zones 1 and 2, the continuous insulation requirements in Table 402.2.5 shall be permitted to be reduced to R-3 for steel frame wall assemblies with studs spaced at 24 inches (610 mm) on center. | | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC- Table 402.1.1. The following exceptions apply. A) Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC - Table 402.2.5. In climate zones 1 and 2, the continuous insulation requirements in this table shall be permitted to be reduced to R-3 for steel-frame wall assemblies with | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Insulation levels in a home shall meet or exceed the component insulation requirements in the 2009 IECC- Table 402.1.1. The following exceptions apply. A) Steel-frame ceilings, walls, and floors shall meet the insulation requirements of the 2009 IECC - Table 402.2.5. In climate zones 1 and 2, the continuous insulation requirements in this table shall be |

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| | | | | | | | total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | studs spaced at 24" on center. This exception shall not apply if the alternative calculations in D) apply. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all non0fenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. ... The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | permitted to be reduced to R-3 for steel-frame wall assemblies with studs spaced at 24" on center. This exception shall not apply if the alternative calculations in D) apply. D) An alternative equivalent U-factor or total UA calculation may also be used to demonstrate compliance, as follows: An assembly with a U-factor equal or less than specified in 2009 IECC Table 402.1.3 complies. A total building thermal envelope UA that is less than or equal to the total UA resulting from the U-factors in Table 402.1.3 also complies. The insulation levels of all nonfenestration components (i.e., ceilings, walls, floors, and slabs) can be traded off using the UA approach under both the Prescriptive and the Performance path. ... The UA calculation shall be done using a method consistent with the ASHRAE Handbook of Fundamentals and shall include the thermal bridging effects of framing materials. The calculation for a steel-frame envelope assembly shall use a series-parallel path calculation method. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.6 Floors. | Floor insulation shall be installed to maintain permanent contact with the underside of the subfloor decking. | 701.4.3.2 Floors, foundations, and crawlspaces (Mandatory)<br>(1) Floors. (including insulated floors above garages and cantilevered floors)<br>(a) Insulation is installed to maintain permanent contact with the underside of the subfloor decking, enveloping any attached ductwork within the thermal envelope without compression or air gaps in the insulation. This practice does not apply to ducts or other mechanical equipment that is adjacent to the underside of the subfloor.<br>(b) Batt and loose-fill insulation is held in place by permanent attachments or systems in accordance with the manufacturer's instructions. | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaced).<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compressions. Blown-in insulation is verified to have proper density with firm packing. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.7 Basement walls. | Walls associated with conditioned basements shall be insulated from the top of the basement wall down to 10 feet (3048 mm) below grade or to the basement floor, whichever is less. Walls associated with unconditioned basements shall meet this requirement unless the floor overhead is insulated in | 703.1 Building Envelope (Optional, Prescriptive path)<br>703.1.2 The insulation installation is graded by a third party and is in accordance with Sections 703.1.2.1, 703.1.2.2, 703.1.2.3, and/or 703.1.2.4 as applicable. (Points not awarded in this section if already awarded under Section 703.1.1)<br>703.1.2.2 Grade 1 installation is in | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |

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| | | | | accordance with Sections 402.1.1 and 402.2.6. | accordance with the following:<br>(1) Insulation uniformly fills each cavity side-to-side and top-to-bottom, without substantial gaps or voids around obstructions (such as blocking or bridging).<br>(8) Grade 1 insulation meets or exceeds all requirements for Grade 2 insulation.<br>703.1.2.3 Grade 2 insulation is in accordance with the following:<br>(2) In conditioned basements or crawlspaces the following apply:<br>(a) insulation is installed in complete contact with the subfloor surfaces.<br>(b) floor insulation over vented or ambient conditions is enclosed on six sides.<br>(3) Floor insulation over unconditioned basements is not required to be enclosed on six sides. | | RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.8 Slab-on-grade floors. | Slab-on-grade floors with a floor surface less than 12 inches (305 mm) below grade shall be insulated in accordance with Table 402.1.1. The insulation shall extend downward from the top of the slab on the outside or inside of the foundation wall. Insulation located below grade shall be extended the distance provided in Table 402.1.1 by any combination of vertical insulation, insulation extending under the slab or insulation extending out from the building. Insulation extending away from the building shall be protected by pavement or by a minimum of 10 inches (254 mm) of soil. The top edge of the insulation installed between the exterior wall and the edge of the interior slab shall be permitted to be cut at a 45-degree (0.79 rad) angle away from the exterior wall. Slab-edge insulation is not required in jurisdictions designated by the code official as having a very heavy termite infestation. | - | EA 2: Insulation - Prescriptive Path<br>Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaced). Only at Climate Zones 4 and Higher: 1.4- Slab-edge insulation (A maximum of 25% of the slab edge may be uninsulated in Climate Zones 4 and 5).<br>Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. Consistent with the 2009 IECC, slab edge insulation is only required for slab-on-grade floors with a floor surface less than 12 inches below grade. Slab insulation shall extend to the top of the slab to provide a complete thermal break. If the top edge of the insulation is installed between the exterior wall and the edge of the interior slab, it shall be permitted to be cut at a 45-degree angle away from the exterior wall. |

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| | | | | | | | series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | | |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.9 Crawl space walls. | As an alternative to insulating floors over crawl spaces, crawl space walls shall be permitted to be insulated when the crawl space is not vented to the outside. Crawl space wall insulation shall be permanently fastened to the wall and extend downward from the floor to the finished grade level and then vertically and/or horizontally for at least an additional 24 inches (610 mm). Exposed earth in unvented crawl space foundations shall be covered with a continuous Class I vapor retarder in accordance with the International Building Code. All joints of the vapor retarder shall overlap by 6 inches (153 mm) and be sealed or taped. The edges of the vapor retarder shall extend at least 6 inches (153 mm) up the stem wall and shall be attached to the stem wall. | 701.4.3 Insulation and air sealing (Mandatory)<br>(2) Crawlspace. Where insulated, crawlspace wall insulation is permanently attached to the walls. Exposed earth in unvented crawlspaces is covered with continuous vapor retarder with overlapping joints that are taped or masticed. | EA 2: Insulation - Prescriptive Path Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0- Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.10 Masonry veneer. | Insulation shall not be required on the horizontal portion of the foundation that supports a masonry veneer. | - | EA 2: Insulation - Prescriptive Path Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |

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| | | | | | | | provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | | |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.2 Specific insulation requirements. 402.2.11 Thermally isolated sunroom insulation. | The minimum ceiling insulation R-values shall be R-19 in Zones 1 through 4 and R-24 in Zones 5 through 8. The minimum wall R-value shall be R-13 in all zones. New wall(s) separating a sunroom from conditioned space shall meet the building thermal envelope requirements. | - | EA 2: Insulation - Prescriptive Path Prerequisite 2.1 Basic Insulation (Mandatory). Meet all the following requirements:<br>a) Install insulation that meets or exceeds the R-value requirements listed in Chapter 4 of the 2004 International Energy Conservation Code. | (Mandatory)Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier and Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR Alternate for Climate Zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | (Recommended) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels.<br>V2.5 Program Requirements: The Version 2 slab edge insulation exemption remains only for Version 2.5; therefore, up to 25% of the slab edge may be uninsulated in 2009 IECC Climate Zones 4 and 5. | (Mandatory) Thermal Enclosure System Rater Checklist<br>2.0 Quality Installed Insulation.<br>2.1 Ceiling, wall, floor, and slab insulation levels shall meet or exceed 2009 IECC levels. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.3 Fenestration. 402.3.1 U-factor. | An area-weighted average of fenestration products shall be permitted to satisfy the U-factor requirements. | 701.4.4 Fenestration (Mandatory)<br>701.4.4.1 NFRC-certified U-factor and SHGC windows, exterior doors, skylights, and tubular daylighting devices (TDDs) are in accordance with ENERGY STAR, or equivalent, or Table 701.4.4.1. Decorative fenestration elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.<br>703.3 Fenestration (Optional, Prescriptive path)<br>703.3.1 The NFRC-certified (or equivalent) U-factor and SHGC for windows...are in accordance with Table 703.3.1(a) or (b)... | - | Prescriptive Path: Windows must meet or exceed version 4.0 of the Energy Star Program Requirements for Residential Windows, Doors, and Skylights (additional requirements for CZ 2 & 4). | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.3 Fenestration. 402.3.2-402.3.3. | **402.3.2 Glazed fenestration SHGC.** An area-weighted average of fenestration products more than 50 percent glazed shall be permitted to satisfy the SHGC requirements.<br>**402.3.3 Glazed fenestration exemption**. Up to 15 square feet (1.4m2) of glazed fenestration per dwelling unit shall be permitted to be exempt from U-factor and SHGC requirements | 701.4.4.1 (Mandatory)<br>...Decorative fenestration elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice.<br>703.3.1. (Optional)...Decorative fenestration elements with a maximum area of 15 square feet or 10 percent of the total glazing area, whichever is less, are not required to comply with this practice. | EA 4: Windows - Prescriptive Path<br>Note: Up to 0.75% of the window-to-floor area may be used for decorative glass or skylight area that does not meet the U-factor and SHGC requirements above. | Prescriptive Path: Windows must meet or exceed version 4.0 of the Energy Star Program Requirements for Residential Windows, Doors, and Skylights (additional requirements for CZ 2 & 4). Refer to the county-level BOPs on EPA's website for the specific window performance levels required in each county of the country. | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential |

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| | | | | in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the Total UA alternative in Section 402.1.4. | | | | Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.3 Fenestration. 402.3.4 Opaque door exemption. | One side-hinged opaque door assembly up to 24 square feet (2.22 m2) in area is exempted from the U-factor requirement in Section 402.1.1. This exemption shall not apply to the U-factor alternative approach in Section 402.1.3 and the total UA alternative in Section 402.1.4. | - | - | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path : Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.3 Fenestration. 402.3.5 Thermally isolated sunroom U-factor. | For Zones 4 through 8, the maximum fenestration U-factor shall be 0.50 and the maximum skylight U-factor shall be 0.75. New windows and doors separating the sunroom from conditioned space shall meet the building thermal envelope requirements. | - | - | - | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Prescriptive | 402.3 Fenestration. 402.3.6 Replacement fenestration. | Where some or all of an existing fenestration unit is replaced with a new fenestration product, including sash and glazing, the replacement fenestration unit shall meet the applicable requirements for U-factor and | 703.3 Fenestration (Optional, Prescriptive Path)<br>Renovation Note: Section 703.3.1 applies only to the replacement of existing windows. Points available on the basis of a ratio of new window area to total window area (new window area/total | - | - | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration |

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| | | | | SHGC in Table 402.1.1. | window area). | | | shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. | The building thermal envelope shall be durably sealed to limit infiltration. The sealing methods between dissimilar materials shall allow for differential expansion and contraction. The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material: | - | - | - | - | - |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (1) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>1. All joints, seams and penetrations. | 701.4.3 Insulation and air sealing (Mandatory).<br>701.4.3.1 General. Insulation and air sealing is in accordance with the following:<br>(1) Insulation. Insulation is installed in accordance with the manufacturer's instructions or local code, as applicable.<br>(2) Shafts (duct shaft, piping shaft/penetrations, flue shaft). Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam. Fire-rated collars and caulking are installed where required.<br><br>703.2.1.2 Air Barriers (Optional, Prescriptive path). Air barrier is installed at any exterior edge of insulation at floors, foundations, and crawlspaces including insulated floors above garages and cantilevered floors. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air | 701.4.3 Insulation and air sealing (Mandatory).<br>701.4.3.3 Walls | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing |

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| | | | Building thermal envelope. (2) | barrier material, suitable film or solid material:<br>2. Site-built windows, doors and skylights. | (1) Windows and doors. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier.<br>(4) Skylights and knee walls. Skylight shafts and knee walls are insulated to the same level as the exterior walls.<br>703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.3 Walls<br>(4) Skylight shafts and knee walls are air sealed. Insulation on attic knee walls and skylight shafts are physically supported by stapling in place, netting, or using other mechanical attachment. | | Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces). | 5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | 5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (3) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>3. Openings between window and door assemblies and their respective jambs and framing. | 701.4.3 Insulation and air sealing (Mandatory).<br>701.4.3.3 Walls<br>(1) Windows and doors. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed.<br>5.2.4 Rough Openings around windows and exterior doors sealed with caulk or foam.<br>5.3 Other Openings |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (4) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>4. Utility penetrations. | 701.4.3 Insulation and air sealing (Mandatory).<br>701.4.3.3 Walls<br>(1) Windows and doors. Caulking, gasketing, adhesive flashing tape, foam sealant, or weatherstripping is installed forming a complete air barrier. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam. |

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| | | | | | | | no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | | |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (5) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>5. Dropped ceilings or chases adjacent to the thermal envelope. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.4 Ceilings and attics.<br>(1) At dropped ceilings and soffits, the air barrier is substantially aligned with insulation and any gaps are sealed with caulk, foam, or tape. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.3 Ceilings<br>3.3.1 Dropped ceiling/soffit below unconditioned attic. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.3 Ceilings<br>3.3.1 Dropped ceiling/soffit below unconditioned attic. |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (6) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>6. Knee walls. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.3 Walls<br>(4) Skylight shafts and knee walls are air sealed. Insulation on attic knee walls and skylight shafts are physically supported by stapling in place, netting, or using other mechanical attachment.<br>703.2.1.4 Ceilings and attics.<br>(2) Access to vented attics, including knee wall doors and/or drop down stairs, is caulked, gasketed, or otherwise sealed. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.3 Attic knee walls / sloped attics | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.3 Attic knee walls / sloped attics |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (7) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>7. Walls and ceilings separating a garage from conditioned spaces. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.2 Air barriers.<br>Air barrier is installed at any exterior edge of insulation at floors, foundations, and crawlspaces including insulated floors above garages and cantilevered floors. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space.<br>3.2 Floors<br>3.2.1 Floor above garage | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space.<br>3.2 Floors<br>3.2.1 Floor above garage |

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| | | | | | | | insulation fully supported. Continuous top and bottom plates or sealed blocking. | 3.3 Ceilings<br>3.3.3 All other ceilings | 3.3 Ceilings<br>3.3.3 All other ceilings |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (8) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>8. Behind tubs and showers on exterior walls. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.3 Walls<br>(1) Exterior wall(s) behind the tub/shower is insulated and includes an interior and exterior air barrier. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.1 Walls behind showers and tubs<br>3.1.9 All other exterior walls | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers<br>3.1 Walls<br>3.1.1 Walls behind showers and tubs<br>3.1.9 All other exterior walls |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (9) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>9. Common walls between dwelling units. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.3 Walls<br>(3) Duplex and townhouse construction: In the common walls between dwelling units (e.g., gypsum shaft wall), an air barrier is installed to seal the gap between the common wall and the structural framing. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>6.0 Common Walls Between Dwelling Units. Gap between drywall shaft wall (i.e., common wall) and the structural framing between units is fully sealed at all exterior boundary conditions. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.7 Double walls<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed<br>5.2.7 In multi-family buildings, the gap between the drywall shaft wall (i.e. common wall) and the structural framing between units fully sealed at all exterior boundary conditions. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers:<br>3.1 Walls<br>3.1.7 Double walls<br>5.0 Air Sealing<br>5.2 Cracks in the building envelope fully sealed<br>5.2.7 In multi-family buildings, the gap between the drywall shaft wall (i.e. common wall) and the structural framing between units fully sealed at all exterior boundary conditions. |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (10) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>10. Attic access openings. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1.4 Ceilings and attics.<br>(2) Access to vented attics, including knee wall doors and/or drop down stairs, is caulked, gasketed, or otherwise sealed. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>5.0 Attic/ Ceiling Interface. All attic penetrations and dropped ceilings include a full interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.3 Other Ceilings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.3 Other Ceilings<br>5.3.2 Attic access panels and drop-down stairs equipped with a durable ≥R-10 insulated cover that is gasketed (i.e., not caulked) to produce continuous air seal when occupant is not accessing the attic. |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (11) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>11. Rim joist junction. | 701.4.3. Insulation and air sealing (Mandatory)<br>701.4.3.3 Walls<br>(2) Band joist and rim joints. Band and rim joists are insulated and air sealed. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing. | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers: At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior surface of floors in all climate zones, including | (Mandatory) Thermal Enclosure System Rater Checklist<br>3.0 Fully-Aligned Air Barriers: At each insulated location noted below, a complete air barrier shall be provided that is fully aligned with the insulation as follows: 1) At interior surface of ceilings in all climate zones; also, at interior edge of attic eave in all climate zones using a wind baffle that extends to the fully height of the insulation. Include a baffle in every bay or a tabbed baffle in each bay with a soffit vent that will also prevent wind washing of insulation in adjacent bays.2) At exterior surface of walls in all climate zones; and also at interior surface of walls for climate zones 4-8. 3) At interior |

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| | | | | | | | | supports to ensure permanent contact and blocking at exposed edges.<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space | surface of floors in all climate zones, including supports to ensure permanent contact and blocking at exposed edges.<br>3.1 Walls<br>3.1.8 Garage rim / band joist adjoining conditioned space |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.1 Building thermal envelope. (12) | The following shall be caulked, gasketed, weatherstripped or otherwise sealed with an air barrier material, suitable film or solid material:<br>12. Other sources of infiltration. | 701.4.3.3 Walls (Mandatory)<br>(3) Between foundation and sill plate bottom plate...<br>(5) Exterior architectural features. Code required building envelope insulation and air sealing are not disrupted at exterior architectural features such as stairs and decks.<br>703.2.1.1.4 HVAC register boots (Optional). HVAC register boots that penetrate the building envelope are caulked or sealed to the subfloor or drywall.<br>703.2.1.4 Ceilings and attics (Optional).<br>(3) An insulated cover is gasketed or sealed to the attic opening where a whole building or whole dwelling unit fan penetrates into the attic. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings | (Mandatory) Thermal Enclosure System Rater Checklist<br>5.0 Air Sealing<br>5.1 Penetrations to unconditioned space fully sealed with solid blocking or flashing as needed and gaps sealed with caulk or foam.<br>5.2 Cracks in the building envelope fully sealed<br>5.3 Other openings |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.1 Testing option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>**402.4.2.1 Testing option.**<br>Building envelope tightness and insulation installation shall be considered acceptable when tested air leakage is less than seven air changes per hour (ACH) when tested with a blower door at a pressure of 50 pascals (1 psf). Testing shall | 704.6 Installation and performance verification (Optional).<br>704.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable.<br>Minimum of two inspections are performed. One inspection after insulation is installed and prior to being covered, and another inspection upon completion of the project...<br>704.6.2 Third party testing is conducted to verify performance.<br>704.6.2.1 Building envelope leakage rate is demonstrated by blower door test. In addition to the test, the following | EA 3: Air Infiltration - Prescriptive Path<br>Pre-requisite 3.1 (Mandatory). Reduced Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater.<br>Credit 3.2 (Optional). Greatly Reduced Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must be tested and verified by an energy rater.<br>OR<br>Credit 3.3 (Optional) Minimal Envelope Leakage. Meet the air leakage requirements shown in Table 1. The air leakage rate must | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>2.10 HVAC Infiltration rates shall be less than or equal to the following values:<br>6 ACH50 in CZs 1,2<br>5 ACH50 in CZs 3,4<br>4 ACH50 in CZs 5,6,7<br>3 ACH50 in CZ 8 | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>2.10 HVAC Infiltration rates shall be less than or equal to the following values:<br>6 ACH50 in CZs 1,2<br>5 ACH50 in CZs 3,4<br>4 ACH50 in CZs 5,6,7<br>3 ACH50 in CZ 8 |

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| | | | | occur after rough in and after installation of penetrations of the building envelope, including penetrations for utilities, plumbing, electrical, ventilation and combustion appliances. During testing:<br>1. Exterior windows and doors, fireplace and stove doors shall be closed, but not sealed;<br>2. Dampers shall be closed, but not sealed, including exhaust, intake, makeup air, backdraft and flue dampers;<br>3. Interior doors shall be open;<br>4. Exterior openings for continuous ventilation systems and heat recovery ventilators shall be closed and sealed;<br>5. Heating and cooling system(s) shall be turned off;<br>6. HVAC ducts shall not be sealed; and<br>7. Supply and return registers shall not be sealed. | practices are required...<br>(4) The maximum leakage rate is in accordance with:<br>(a) 5 ACH50 (3 points)<br>(b) 4 ACH50 (6 points)<br>(c) 3 ACH50 (9 points)<br>(d) 2 ACH50 (12 points)<br>(e) 1 ACH50 (15 points) | be tested and verified by an energy rater. | Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | | |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.2 Air sealing and insulation.<br>402.4.2.2 Visual inspection option. | Building envelope air tightness and insulation installation shall be demonstrated to comply with one of the following options given by Section 402.4.2.1 or 402.4.2.2:<br>**402.4.2.2 Visual inspection option.** Building envelope tightness and insulation installation shall be considered acceptable when the items listed in Table 402.4.2, applicable to the method of construction, are field verified. Where required by the code official, an approved party independent from the installer of the insulation shall inspect the air barrier and insulation. | 703.2 Insulation and air sealing (Optional, Prescriptive path).<br>703.2.1 Insulation and air sealing is installed in accordance with all of the following [Sections 703.2.1.1-703.2.1.4], as applicable:<br>(1) third-party verification performed<br>704.6 Installation and performance verification (Optional).<br>704.6.1 Third-party on-site inspection is conducted to verify compliance with all of the following, as applicable.<br>Minimum of two inspections are performed. One inspection after insulation is installed and prior to being covered, and another inspection upon completion of the project... | - | (Mandatory) Thermal Bypass Inspection Checklist<br>1.0 Overall Air Barrier And Thermal Barrier Alignment. Insulation shall be installed in full contact with sealed interior and exterior air barrier except for alternate to interior air barrier under item no. 2 (Walls Adjoining Exterior Walls or Unconditioned Spaces).<br>2.0 Walls Adjoining Exterior Walls or Unconditioned Spaces. Fully insulated wall aligned with air barrier at both interior and exterior, OR, alternate for climate zones 1 thru 3, sealed exterior air barrier aligned with RESNET Grade 1 Insulation fully supported. Continuous top and bottom plates or sealed blocking.<br>3.0 Floors between Conditioned and Exterior Spaces. Air barrier is installed at any exposed fibrous insulation edges. Insulation is installed to maintain permanent contact with sub-floor above including necessary supports (e.g., staves for blankets, netting for blown-in). Blanket insulation is verified to have no gaps, voids or compression. Blown-in insulation is verified to have proper density with firm packing.<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>5.0 Attic/Ceiling Interface. All attic penetrations and dropped ceilings include a fully interior air barrier aligned with | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>3. Fully-Aligned Air Barriers<br>5. Air Sealing<br>5.3 Other Openings | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>3. Fully-Aligned Air Barriers<br>5. Air Sealing<br>5.3 Other Openings |

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| | | | | | | | insulation with any gaps fully sealed with caulk, foam or tape. Movable insulation fits snugly in opening and air barrier is fully gasketed. | | |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.3 Fireplaces. | New wood-burning fireplaces shall have gasketed doors and outdoor combustion air. | 703.2.1.1.5 Masonry Fireplaces (Optional, Prescriptive path). Masonry fireplaces are equipped with gasketed doors, outside combustion air, and a chimney top damper. | EQ 2: Combustion Venting - Prescriptive Path<br>Prerequisite 2.1 Basic Combustion Venting Measures (Mandatory). Meet all the following requirements…<br>c) All fireplaces and woodstoves must have doors.<br>d) Space and water heating equipment that involves combustion must meet one of the following...<br>i. it must be designed and installed with closed combustion (i.e., sealed supply air and exhaust ducting<br>ii. it must be designed and installed with power-vented exhaust; or<br>iii. it must be located in a detached utility building or open-air facility.<br><br>Credit 2.2 Enhanced Combustion Venting Measures (Optional). Install no fireplace or woodstove, or design and install a fireplace or woodstove according to the requirements in Table 1. | - | - | - |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.4 Air leakage.<br>402.4.4 Fenestration air leakage. | Windows, skylights and sliding glass doors shall have an air infiltration rate of no more than 0.3 cfm per square foot (1.5 L/s/m2), and swinging doors no more than 0.5 cfm per square foot (2.6 L/s/m2), when tested according to NFRC 400 or AAMA/WDMA/CSA 101/I.S.2/A440 by an accredited, independent laboratory and listed and labeled by the manufacturer. **Exceptions:** Site-built windows, skylights and doors. | - | - | Prescriptive Path: The building thermal envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential | Building | Mandatory | 402.4 Air | Recessed luminaires installed in | 701.4.3.4 Ceilings and attics (Mandatory) | - | Prescriptive Path: The building thermal | (Mandatory) Thermal Enclosure | (Mandatory) Thermal Enclosure |

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| Energy Efficiency | Thermal Envelope | | leakage.<br>402.4.5 Recessed lighting. | the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires shall be IC-rated and labeled as meeting ASTM E 283 when tested at 1.57 psf (75 Pa) pressure differential with no more than 2.0 cfm (0.944 L/s) of air movement from the conditioned space to the ceiling cavity. All recessed luminaires shall be sealed with a gasket or caulk between the housing and the interior wall or ceiling covering. | (2) Recessed lighting. Recessed light fixtures that penetrate the thermal envelope are airtight, IC-rated, and sealed with gasket, caulk, or foam. | | envelope must meet the following requirements. Infiltration (ACH50): 7 in CZ's 1-2, 6 in CZ's 3-4, 5 in CZ's 5-7, and 4 in CZ 8. And insulation levels must meet or exceed the 2004 IRC, and a completed Thermal Bypass Inspection checklist must be performed. Envelope leakage must be determined by a RESNET- certified rater using a RESNET- approved testing protocol. Insulation levels of a home must meet or exceed Sections N1102.1 and N1102.2 of the 2004 IRC. These sections allow for compliance to be determined by meeting prescriptive insulation requirements, by using U-factor alternatives, or by using a total UA alternative. These sections also provide guidance and exceptions that may be used. However, note that the U-factor for steel-frame envelope assemblies addressed in Section N1102.2.4 shall be calculated using the ASHRAE zone method, or a method providing equivalent results, and not a series-parallel path calculation method as is stated in the code. Additionally, Section N1102.2.2, which allows for the reduction of ceiling insulation in space constrained roof/ceiling assemblies, shall be limited to 500 sq. ft. or 20% of ceiling area, whichever is less. In all cases, insulation shall be inspected to Grade 1 installation as defined in the RESNET Standards by a RESNET-certified rater. | System Rater Checklist<br>5.0 Air Sealing<br>5.1.5 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and fully gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to ≥R-10 in climate zone 4 and higher to minimize condensation potential. | System Rater Checklist<br>5.0 Air Sealing<br>5.1.5 Recessed lighting fixtures adjacent to unconditioned space ICAT labeled and fully gasketed. Also, if in insulated ceiling without attic above, exterior surface of fixture insulated to ≥R-10 in climate zone 4 and higher to minimize condensation potential. |
| Residential Energy Efficiency | Building Thermal Envelope | Mandatory | 402.5 Maximum fenestration U-factor and SHGC. | The area-weighted average maximum fenestration U-factor permitted using trade-offs from Section 402.1.4 or 404 shall be 0.48 in Zones 4 and 5 and 0.40 in Zones 6 through 8 for vertical fenestration, and 0.75 in Zones 4 through 8 for skylights. The area-weighted average maximum fenestration SHGC permitted using trade-offs from Section 404 in Zones 1 through 3 shall be 0.50. | - | - | - | (Recommended) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. | (Mandatory) Thermal Enclosure System Rater Checklist<br>1.0 High-Performance Fenestration<br>1.1 Prescriptive Path: Fenestration shall meet or exceed ENERGY STAR* requirements.<br>1.2 Performance Path: Fenestration shall meet or exceed 2009 IECC requirements.<br><br>*ENERGY STAR Program Requirements for Residential Windows, Doors, and Skylights – Version 5.0 as outlined at www.energystar.gov/windows. |
| Residential Energy Efficiency | Systems | Mandatory | 403.1 Controls.<br>403.1.1 Programmable thermostat. | At least one thermostat shall be provided for each separate heating and cooling system.<br>**403.1.1 Programmable thermostat.** Where the primary heating system is a forced-air furnace, at least one thermostat per dwelling unit shall be capable of controlling the heating and cooling system on a daily schedule to maintain different temperature set points at different times of the day. This thermostat shall include the | 703.4 HVAC equipment efficiency (Optional, Prescriptive path)<br>703.4.10 An ENERGY STAR, or equivalent, programmable thermostat is installed to control each heating and cooling zone.<br>705.1 Energy consumption control. (Optional)<br>A whole building or whole dwelling unit device is installed that controls or monitors energy consumption.<br>(1) programmable communicating thermostat<br>(2) Energy-monitoring device | EA 6: Space Heating and Cooling Equipment - Prescriptive Path<br>Prerequisite 6.1 (Mandatory). Good HVAC Design and Installation. Meet each of the following requirements…<br>c) Install ENERGY STAR labeled programmable thermostat (except heat pumps and hydronic systems).<br><br>Update (1/1/10): To meet EA 6.1(c), programmable thermostats are no longer required to be ENERGY STAR labeled. | Prescriptive Path: Energy Star qualified thermostat (except for zones with radiant heat). | (Recommended) National Program Requirements<br>Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual thermostat is allowed | (Mandatory) National Program Requirements<br>Programmable thermostat shall be installed unless thermostat controls a zone with electric radiant heat, for which a manual thermostat is allowed. |

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| | | | | capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). The thermostat shall initially be programmed with a heating temperature set point no higher than 70°F (21°C) and a cooling temperature set point no lower than 78°F (26°C). | (3) energy management control system | | | | |
| Residential Energy Efficiency | Systems | Mandatory | 403.1 Controls. 403.1.2 Heat pump supplementary heat. | Heat pumps having supplementary electric-resistance heat shall have controls that, except during defrost, prevent supplemental heat operation when the heat pump compressor can meet the heating load. | 703.4 HVAC equipment efficiency (Optional, Prescriptive path)<br>703.4.4 Heat pump heating efficiency is in accordance with Table 703.4.4. Refrigerant charge is verified for compliance with manufacturer's instructions.<br>Zones 5-9 require consideration for use of resistance heat in cold climates when installing a heat pump. | EA 6: Space Heating and Cooling Equipment - Prescriptive Path<br>If a heat pump is installed with a programmable thermostat, the thermostat must be equipped with adaptive recovery. This technology enables the heating equipment to gradually adjust when the thermostat setting changes, preventing overdependence on the less efficient backup heating system. | - | (Recommended) HVAC System Quality Installation Contractor Checklist<br>18. For homes with heat pumps, the thermostat shall have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating. | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>18. For homes with heat pumps, the thermostat shall have "Adaptive Recovery" technology to prevent the excessive use of electric back-up heating. |
| Residential Energy Efficiency | Systems | Prescriptive | 403.2 Ducts. 403.2.1 Insulation. | Supply ducts in attics shall be insulated to a minimum of R-8. All other ducts shall be insulated to a minimum of R-6.<br>**Exception:** Ducts or portions thereof located completely inside the building thermal envelope. | 704.4 Ducts (Optional).<br>704.4.2 Space heating is provided by a system that does not include air ducts.<br><br>704.4.3 Space cooling is provided by a system that does not include air ducts. | EA 5: Heating and Cooling Distribution System - Prescriptive Path<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…c) use at least R-6 insulation around ducts in unconditioned spaces. | (Mandatory) Thermal Bypass Inspection Checklist<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required).<br>Performance Path: Leakage must be ≤ 6 cfm outdoors / 100 sq. ft. Prescriptive Path Leakage: ≤ 4 cfm to outdoors / 100 sq. ft. ; and R-6 min. insulation on ducts in unconditioned spaces. | (Recommended) HVAC System Quality Installation Contractor Checklist<br>3.0 Duct insulation- Applies to all heating, cooling, supply ventilation, and pressure balancing ducts.<br>3.1 All connections to trunk ducts in unconditioned space are insulated.<br>3.2 Prescriptive Path: Supply ducts in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned space have insulation ≥ R- 6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6. | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>3.0 Duct insulation- Applies to all heating, cooling, supply ventilation, and pressure balancing ducts.<br>3.1 All connections to trunk ducts in unconditioned space are insulated.<br>3.2 Prescriptive Path: Supply ducts in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned space have insulation ≥ R- 6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6. |
| Residential Energy Efficiency | Systems | Mandatory | 403.2 Ducts. 403.2.2 Sealing. | All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. | 701.4.2 Duct systems (Mandatory).<br>701.4.2.1 Ducts are sealed with tape complying with UL 181, mastic, gaskets, or an approved system as required by the IRC, Section M1601.3.1, or IMC, Section 603.9, to reduce leakage. | - | (Mandatory) Thermal Bypass Inspection Checklist<br>4.0 Shafts. Openings to unconditioned space are fully sealed with solid blocking or flashing and any remaining gaps are sealed with caulk or foam (provide fire-rated collars and caulking where required). | (Mandatory) Program V2.5 Requirements:<br>Duct leakage to outdoors is maintained at the v2 levels and shall not exceed the following limits:<br>o 4 CFM / 100 sq ft of conditioned floor area for the prescriptive path<br>o 6 CFM / 100 sq ft of conditioned floor area for the performance path<br>No limit on total duct leakage is imposed. | (Mandatory) 14. For all homes that have less than 1,200 sq ft of conditioned floor area (CFA), total measured duct leakage shall be < 8 CFM25 per 100 sq. ft. of CFA and measured duct leakage to outdoors shall be < 5 CFM25 per 100 sq. ft. of CFA.<br>15. If total duct leakage is < 4 CFM25 per 100 sq. ft. of conditioned floor area, or < 5 CFM25 per 100 sq. ft. of conditioned floor area for homes that have less than 1,200 sq. ft. of conditioned floor area, then leakage to outdoors need not be tested. |
| Residential Energy Efficiency | Systems | Mandatory | 403.2 Ducts. 403.2.2 Sealing. (1-2) | Duct tightness shall be verified by either of the following:<br>1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (226.5 L/min) per 100 ft2 (9.29 m2) of conditioned floor area or a total | 704.6 Installation and performance verification. (Optional)<br>704.6.2.2 The entire central HVAC duct system, including air handlers and register boots, is tested for leakage at a pressure differential of 0.1 inches w.g. (25 Pa). The maximum leakage as a | EA 5: Heating and Cooling Distribution System - Prescriptive Path<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…a) Limit duct air leakage rate to outside the conditioned envelope. The | Performance Path: Ducts must be sealed and tested to be ≤ 6 cfm outdoors / 100 sq. ft of conditioned floor area, as determined and documented by a RESNET- certified rater using a RESNET- approved testing protocol. If total duct leakage is ≤ 6 cfm to outdoors / | (Mandatory) Program V2.5 Requirements:<br>Duct leakage to outdoors is maintained at the v2 levels and shall not exceed the following limits:<br>o 4 CFM / 100 sq ft of conditioned floor area for the prescriptive path | (Mandatory) 14. For all homes that have less than 1,200 sq ft of conditioned floor area (CFA), total measured duct leakage shall be < 8 CFM25 per 100 sq. ft. of CFA and measured duct leakage to outdoors shall be < 5 CFM25 per 100 sq. ft. |

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| | | | | leakage less than or equal to 12 cfm (12 L/min) per 100 ft2 (9.29 m2) 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.<br>2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (169.9 L/min) per 100 ft2 (9.29 m2) of conditioned floor area when tested at a pressure differential of 0.1 inches w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots 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 4 cfm (113.3 L/min) per 100 ft2 (9.29 m2) of conditioned floor area.<br>**Exceptions:** Duct tightness test is not required if the air handler and all ducts are located within conditioned space. | percent of the system design flow rate is in accordance with the following:<br>(1) 6 percent for ductwork entirely outside the building's thermal envelope<br>(2) 6 percent for ductwork entirely inside the building's thermal envelope<br>(3) 6 percent for ductwork both inside and outside the building's thermal envelope | tested duct leakage rate must be <= 4.0 cfm at 25 Pascals per 100 square feet of conditioned floor area (for each installed system), verified by the energy rater. Testing is waived if the home meets EA 5.3 (b) or (c). | 100 sq. ft. of conditioned floor area, then leakage to outdoors does not need to be tested. Duct leakage testing can be waived if all ducts and air handling equipment are located in conditioned space (i.e., within the home's air and thermal barriers) AND the envelope leakage has been tested to be ≤3 ACH50 of ≤ 0.25 CFM 50 per sq. ft. of the building envelope. Note that mechanical ventilation will be required in this situation.<br>Prescriptive Path: Leakage: ≤ 4 cfm to outdoors / 100 sq. ft. ; and R-6 min. insulation on ducts in unconditioned spaces. | o 6 CFM / 100 sq ft of conditioned floor area for the performance path No limit on total duct leakage is imposed. | of CFA.<br>15. If total duct leakage is < 4 CFM25 per 100 sq. ft. of conditioned floor area, or < 5 CFM25 per 100 sq. ft. of conditioned floor area for homes that have less than 1,200 sq. ft. of conditioned floor area, then leakage to outdoors need not be tested. |
| Residential Energy Efficiency | Systems | Mandatory | 403.2 Ducts.<br>403.2.3 Building cavities. | Building framing cavities shall not be used as supply ducts. | 701.4.2 Duct Systems (Mandatory).<br>701.4.2.2 Building cavities are not used as supply ducts. | EA 5: Heating and Cooling Distribution System - Prescriptive Path<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…b) Do not install ducts in exterior walls unless extra insulation is added to maintain the overall UA for an exterior wall without ducts. Ducts may be run inside interior wall cavities but must be fully ducted (i.e., do not use the wall cavity as the duct). | EPA recommends, but does not require, locating ducts within the home's conditioned space (i.e., inside the air and thermal barriers), and using a minimum of R-4 insulation for ducts inside the conditioned space to prevent condensation. | (Recommended) HVAC System Quality Installation Contractor Checklist<br>2.0 Duct Quality Installation- Applies to all heating, cooling, ventilation, exhaust, and pressure balancing ducts. 2.5 Building cavities not used as supply or return ducts unless they meet items 3.2, 3.3, 4.1, and 4.2 of this checklist.<br>3.2 Prescriptive Path: Supply duct in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned attic space have insulation ≥ R-6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥R-6. 4.1 Total Rater- measured duct leakage ≤ 6 CFM25 per 100 sq. ft. of conditioned floor area. 4.2 Rater-measured duct leakage to outdoors ≤4 CFM25 per 100 sq. ft. of conditioned floor area. | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>2.0 Duct Quality Installation- Applies to all heating, cooling, ventilation, exhaust, and pressure balancing ducts. 2.5 Building cavities not used as supply or return ducts unless they meet items 3.2, 3.3, 4.1, and 4.2 of this checklist.<br>3.2 Prescriptive Path: Supply duct in unconditioned attic have insulation ≥ R-8. Performance Path: Supply ducts in unconditioned attic space have insulation ≥ R-6. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥R-6. 4.1 Total Rater-measured duct leakage ≤ 6 CFM25 per 100 sq. ft. of conditioned floor area. 4.2 Rater-measured duct leakage to outdoors ≤4 CFM25 per 100 sq. ft. of conditioned floor area. |
| Residential Energy Efficiency | Systems | Mandatory | 403.3 Mechanical system piping insulation. | Mechanical system piping capable of carrying fluids above 105°F (41°C) or below55°F (13°C) shall be insulated to a minimum of R-3. | - | EA 6: Space Heating and Cooling Equipment - Prescriptive Path<br>Credit 6.3 (Optional). Very High-Efficiency HVAC. Design and install HVAC equipment that is substantially better than the equipment required by the ENERGY STAR | - | - | - |

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| | | | | | | Builder Option Package (Table 1). Any piping designed as part of a heat pump system to carry water that is well above (or below) the thermostatic temperature settings in the home must have R-4 insulation or greater. | | | |
| Residential Energy Efficiency | Systems | Mandatory | 403.4 Circulating hot water systems. | All circulating service hot water piping shall be insulated to at least R-2. Circulating hot water systems shall include an automatic or readily accessible manual switch that can turn off the hot water circulating pump when the system is not in use. | 703.5 Water heating design, equipment, and insulation (Optional, Prescriptive path).<br>703.5.4 Insulating hot water pipes<br>703.5.4.1 Hot water lines are insulated to a minimum of R-4. | EA 7: Water Heating<br>Credit 7.1 Efficient Hot Water Distribution (Optional - Performance Path)...Select one of the following designs:<br>a) Structured plumbing system...<br>iv. The system must be designed with a push button control in each full bathroom and the kitchen and an automatic pump shut-off.<br>Credit 7.2 Pipe Insulation (Optional - Prescriptive Path). All domestic hot water piping shall have R-4 insulation. Insulation shall be properly installed on all piping elbows to adequately insulate the 90-degree bend. | (Mandatory) 1.0 Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:<br>a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met; | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.5 Mechanical ventilation. | Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the ventilation system is not operating. | - | - | (Mandatory) 1.0 Where requirements of the local codes, manufacturers' installation instructions, engineering documents, or regional ENERGY STAR programs overlap with the requirements of these guidelines, EPA offers the following guidance:<br>a. In cases where the overlapping requirements exceed the ENERGY STAR guidelines, these overlapping requirements shall be met; | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.6 Equipment sizing. | Heating and cooling equipment shall be sized in accordance with Section M1401.3 of the International Residential Code. | 701.4.1 HVAC systems (Mandatory).<br>701.4.1.1 Space heating and cooling systems/equipment is sized according to heating and cooling loads calculated using ACCA Manual J, or equivalent.<br>701.4.1.2 Where installed as a primary heat source in the building, radiant or hydronic space heating system is designed using industry-approved guidelines (e.g., ACCA Manual J, GAMA H-22, or an accredited design professional's and manufacturer's recommendations). | EA 6: Space Heating and Cooling Equipment - Prescriptive Path<br>Prerequisite 6.1 (Mandatory). Good HVAC Design and Installation. Meet each of the following requirements:<br>a) Design and size HVAC equipment properly using ACCA Manual J, the ASHRAE 2001 Handbook of Fundamentals, or an equivalent computation procedure.<br>b) Install HVAC equipment that meets the requirements of the ENERGY STAR for Homes national Builder Option Package (Table 1).<br>c) Install ENERGY STAR labeled programmable thermostat (except heat pumps and hydronic systems).<br>Credit 6.2 (Optional). High-Efficiency HVAC. Design and install HVAC equipment that is better than the equipment required by the ENERGY STAR Builder Option Package (Table 1)<br>OR<br>Credit 6.3 (Optional). Very High-Efficiency HVAC. Design and install HVAC equipment that is substantially better than the equipment required by the ENERGY STAR Builder Option Package (Table 1). Any piping designed as part of a heat pump system to carry water that is well above (or below) the thermostatic temperature settings in the home must have R-4 insulation or greater. | (Mandatory) 3.0 Cooling equipment shall be sized according to the latest editions of ACCA Manuals J and S, ASHRAE 2001 Handbook of Fundamentals, or an equivalent procedure. Maximum oversizing limit for air conditioners and heat pumps is 15% (with the exception of heat pumps in Climate Zones 5 - 8, where the maximum oversizing limit is 25%). The following operating conditions shall be used in the sizing calculations and verified where reviewed by the rater: Outdoor temperatures shall be the 99.0% and 1.0% design temperatures as published in the ASHRAE Handbook of Fundamentals for the home's location or most representative city for which design temperature data are available; Indoor temperatures shall be 75 F for cooling and 70 F for heating; Infiltration rate shall be selected as "tight", or the equivalent term.<br>In specifying equipment, the next available size may be used. In addition, indoor and outdoor coils shall be matched in accordance with ARI standards. | (Recommended) HVAC System Quality Installation Contractor Checklist<br>1.0 Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manuals J, S, and D, respectively, ASHRAE 2009 Handbook of Fundamentals, or a substantively equivalent procedure. | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>1.0 Heating and cooling loads shall be calculated, equipment capacity shall be selected, and duct systems shall be sized according to the latest editions of ACCA Manuals J, S, and D, respectively, ASHRAE 2009 Handbook of Fundamentals, or a substantively equivalent procedure. |

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| Residential Energy Efficiency | Systems | Mandatory | 403.7 Systems serving multiple dwelling units. | Systems serving multiple dwelling units shall comply with Sections 503 and 504 in lieu of Section 403. | | - | - | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.8 Snow melt system controls. | Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50°F, and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40°F. | - | - | - | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.9 Pools. 403.9.1 Pool heaters. | Pools shall be provided with energy-conserving measures in accordance with Sections 403.9.1 through 403.9.3. **403.9.1 Pool heaters.** All pool heaters shall be equipped with a readily accessible on-off switch to allow shutting off the heater without adjusting the thermostat setting. Pool heaters fired by natural gas or LPG shall not have continuously burning pilot lights. | - | - | - | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.9 Pools. 403.9.2 Time switches. | Time switches that can automatically turn off and on heaters and pumps according to a preset schedule shall be installed on swimming pool heaters and pumps. **Exceptions:** 1. Where public health standards require 24-hour pump operation. 2. Where pumps are required to operate solar- and waste-heat-recovery pool heating systems. | - | - | - | - | - |
| Residential Energy Efficiency | Systems | Mandatory | 403.9 Pools. 403.9.3 Pool covers. | Heated pools shall be equipped with a vapor-retardant pool cover on or at the water surface. Pools heated to more than 90°F (32°C) shall have a pool cover with a minimum insulation value of R-12. **Exception:** Pools deriving over 60 percent of the energy for heating from site-recovered energy or solar energy source. | - | - | - | - | - |
| Residential Energy Efficiency | Electrical Power and Lighting Systems | Prescriptive | 404.1 Lighting equipment. | A minimum of 50 percent of the lamps in permanently installed lighting fixtures shall be high-efficacy lamps. | 704.2 Lighting and appliances 704.2.1 Hard-wired lighting is in accordance with one of the following: (1) A minimum of 50 percent of the total hard-wired lighting fixtures, or the bulbs in those fixtures, qualify as ENERGY STAR or equivalent. (2) A minimum of 50 percent of the total hard-wired lighting fixtures qualify as ENERGY STAR or equivalent. (3) A minimum of 80 percent of the exterior lighting wattage has an efficiency of 40 lumens per watt | EA 8: Lighting - Prescriptive Path Prerequisite 8.1 ENERGY STAR Lights (Mandatory). Install at least four ENERGY STAR labeled light fixtures or ENERGY STAR labeled compact fluorescent light bulbs (CFLs) in high-use rooms (kitchen, dining room, living room, family room, hallways). Credit 8.2 Improved Lighting (Optional). Select and install one or both of the following measures: a) Indoor lighting. Install three additional ENERGY STAR labeled light fixtures or | Prescriptive Path: Five or more Energy Star qualified appliances, light fixtures, ceiling fans equipped with lighting fixtures, water heaters, and/or ventilation fans must be installed. Any combination of Energy Star qualified products listed may be installed to meet this requirement.... Energy Star qualified lighting fixtures installed in the following locations shall not be counted: storage rooms (e.g., closets, pantries, sheds), or garages. | Prescriptive Path: Energy Star qualified CFLs or pin-based lighting in 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be installed. (Alternate: Energy Star Advanced Lighting Package). | Prescriptive Path: ENERGY STAR qualified CFLs or pin-based lighting in 80% of fixtures in RESNET-defined Qualifying Light Fixture Locations shall be installed. (Alternate: ENERGY STAR Advanced Lighting Package). |

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| | | | | | minimum or be a solar-powered light fixture. | ENERGY STAR labeled compact fluorescent light bulbs (CFLs) in high-use rooms.<br>b) Exterior lighting. All exterior lighting must have either motion sensor controls or integrated photovoltaic cells.<br>OR<br>Credit 8.3 Advanced Lighting Package (Optional). Install ENERGY STAR Advanced Lighting Package...consists of a minimum of 60% ENERGY STAR qualified hard-wired fixtures and 100% ENERGY STAR-qualified ceiling fans (if any) OR Install ENERGY STAR labeled lamps in 80% of the fixtures throughout the home. ENERGY STAR labeled CFLs are acceptable. All ceiling fans must be ENERGY STAR labeled. | | | |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.2 Mandatory requirements. | Compliance with this section requires that the mandatory provisions identified in Section 401.2 be met. All supply and return ducts not completely inside the building thermal envelope shall be insulated to a minimum of R-6. | 704.4 Ducts.<br>704.4.2 Space heating is provided by a system that does not include air ducts. (15 points)<br>704.4.3 Space cooling is provided by a system that does not include air ducts. (15 points)<br>704.4.4 Ductwork is in accordance with all of the following: (12 points)<br>(1) Building cavities are not used as return ductwork.<br>(2) Heating and cooling ducts and mechanical equipment are installed within the conditioned building space.<br>(3) Ductwork is not installed in exterior walls. | EA 5: Heating and Cooling Distribution System - Prescriptive Path<br>A. Forced-Air Systems<br>Prerequisite 5.1 Reduced Distribution Losses (Mandatory). Meet the following requirements…c) use at least R-6 insulation around ducts in unconditioned spaces. | - | (Recommended) HVAC System Quality Installation Contractor Checklist<br>3.0 Duct insulation 3.1 All connections to trunk ducts in unconditioned space are insulated. 3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6 | (Mandatory) HVAC System Quality Installation Contractor Checklist<br>3.0 Duct insulation<br>3.1 All connections to trunk ducts in unconditioned space are insulated.<br>3.3 All other supply ducts and all return ducts in unconditioned space have insulation ≥ R-6. |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.3 Performance-based compliance. | Compliance based on simulated energy performance requires that a proposed residence (proposed design) be shown to have an annual energy cost that is less than or equal to the annual energy cost of the standard reference design. Energy prices shall be taken from a source approved by the code official, such as the Department of Energy, Energy Information Administration's State Energy Price and Expenditure Report. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.<br>**Exception:** The energy use based on source energy expressed in Btu or Btu per square foot of conditioned floor area shall be permitted to be substituted for the energy cost. The source energy multiplier for electricity shall be 3.16. The source energy multiplier for fuels other than electricity shall be 1.1. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required.<br>(1) 15 percent (Mandatory - minimum requirement)<br>(2) 30 percent<br>(3) 50 percent<br>(4) 60 percent | EA 1: Optimize Energy Performance - Performance Path<br>Prerequisite 1.1 Performance of ENERGY STAR for Homes. Meet the performance requirements of ENERGY STAR for homes, including third-party inspections.<br>Credit 1.2 Exceptional Energy Performance. Exceed the performance of ENERGY STAR for Homes.<br><br>Clarification (1/1/10): The performance requirements of Energy Star for Homes 2006 are published on the EPA website and include: 1) HERS Index of 80 or lower in climate zones 6-8 or HERS Index of 85 or lower in climate zones 1-5; 2) completed Thermal Bypass Inspection Checklist, including slab-edge insulation in climate zones 4+; 3) duct leakage of less than 6 CFM to outdoors per 100 sq. ft.; 4) at least one Energy Star qualified product (heating or cooling equipment; windows; 5 or more labeled light fixtures, appliances, or ventilation fans); 5) indoor and outdoor coils must be matched, in accordance with AHRI standards; 6) adaptive recovery for any programmable thermostats installed in homes with a heat pump; and 7) maximum oversizing limit for air conditioners and heat | Compliance based on using a performance approach to meet a HERS Index of 80 in Climate Zones 6 - 8 and an 85 in Climate Zones 1 - 5. | National Program Requirements. Performance Path:<br>1.0 Determine the ENERGY STAR HERS Index Target, which is the highest numerical HERS index value that each rated home may achieve to earn the ENERGY STAR. This target shall be specifically determined for each rated home by following the steps outlined in the document titled, "ENERGY STAR HERS Index Target Procedure, Version 3 (Rev. 02)", available on EPA"s Web site. This procedure defines how to configure the ENERGY STAR Reference Design Home and calculate its associated HERS index value and then how to apply the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Note that EPA will provide modified Mandatory Requirements and ENERGY STAR Reference Design specifications for states with energy codes significantly more rigorous than the 2009 IECC. Once published, these modified specifications shall be used after a specified transition period, typically | National Program Requirements. Performance Path<br>1.0 Determine the ENERGY STAR HERS Index Target, which is the highest numerical HERS index value that each rated home may achieve to earn the ENERGY STAR. This target shall be specifically determined for each rated home by following the steps outlined in the document titled, "ENERGY STAR HERS Index Target Procedure, Version 3 (Rev. 02)", available on EPA"s Web site. This procedure defines how to configure the ENERGY STAR Reference Design Home and calculate its associated HERS index value and then how to apply the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Note that EPA will provide modified Mandatory Requirements and ENERGY STAR Reference Design specifications for states with energy codes significantly more rigorous than the 2009 IECC. Once published, these modified |

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| | | | | | | pumps is 15%, with the exception of heat pumps in Climate Zones 5-8, where maximum oversizing is 25%). | | 60 days, to determine the ENERGY STAR HERS Index Target in these states. Note that this process shall be completed manually by a Rater until a version of the RESNET-accredited software program used by the Rater becomes available that automatically configures the ENERGY STAR Reference Design, calculates its associated HERS index value, and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon release of such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version. 2. Using the same RESNET-accredited Home Energy Rating software program, configure the preferred set of energy measures for the rated home and verify that the resulting HERS Index meets or exceeds the ENERGY STAR HERS Index Target, as determined in Step 1. Note that, regardless of the measures selected, Mandatory Requirements for All Qualified Homes in Exhibit 2 are also required. Also note that items 1.2 and 2.1 of the Thermal Enclosure System Rater checklist require that all insulation, windows, doors, and skylights meet or exceed 2009 IECC requirements. | specifications shall be used after a specified transition period, typically 60 days, to determine the ENERGY STAR HERS Index Target in these states. Note that this process shall be completed manually by a Rater until a version of the RESNET-accredited software program used by the Rater becomes available that automatically configures the ENERGY STAR Reference Design, calculates its associated HERS index value, and then applies the appropriate Size Adjustment Factor to determine the ENERGY STAR HERS Index Target. Upon release of such a version, Raters using that software program shall have 60 days to begin all new ratings with this updated version. 2. Using the same RESNET-accredited Home Energy Rating software program, configure the preferred set of energy measures for the rated home and verify that the resulting HERS Index meets or exceeds the ENERGY STAR HERS Index Target, as determined in Step 1. Note that, regardless of the measures selected, Mandatory Requirements for All Qualified Homes in Exhibit 2 are also required. Also note that items 1.2 and 2.1 of the Thermal Enclosure System Rater checklist require that all insulation, windows, doors, and skylights meet or exceed 2009 IECC requirements. |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.1 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. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.2 Compliance report. | Compliance software tools shall generate a report that documents that the proposed design complies with Section 405.3. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.2 | The compliance documentation shall include the following information: | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve | - | - | - | - |

| Category | Topic | Requirement category | IECC Requirement Reference | IECC 2009 | ICC-700 | LEED for Homes | ES2 | ES2.5 | ES3 |
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| | | | Compliance report.(1) | 1. Address or other identification of the residence; | energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | | | | |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.2 Compliance report.(2) | The compliance documentation shall include the following information:<br>2. An inspection checklist documenting the building component characteristics of the proposed design as listed in Table 405.5.2(1). The inspection checklist shall show results for both the standard reference design and the proposed design, and shall document all inputs entered by the user necessary to reproduce the results; | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.2 Compliance report.(3) | The compliance documentation shall include the following information:<br>3. Name of individual completing the compliance report; and | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.2 Compliance report.(4) | The compliance documentation shall include the following information:<br>4. Name and version of the compliance software tool.<br>**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. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.4 Documentation. 405.4.3 Additional documentation. | The code official shall be permitted to require the following documents:<br>1. Documentation of the building component characteristics of the standard reference design.<br>2. A certification signed by the builder providing the building component characteristics of the proposed design as given in Table 405.5.2(1).<br>3. Documentation of the actual values used in the software calculations for the proposed design. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential | Simulated | Performance | 405.5 | **405.5.1 General.** Except as | 702.2 Energy cost performance levels | - | - | - | - |

| Category | Topic | Requirement category | IECC Requirement Reference | IECC 2009 | ICC-700 | LEED for Homes | ES2 | ES2.5 | ES3 |
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| Energy Efficiency | Performance Alternative | | Calculation procedure. | specified by this section, the standard reference design and proposed design shall be configured and analyzed using identical methods and techniques.<br>**405.5.2 Residence specifications.** The standard reference design and proposed design shall be configured and analyzed as specified by Table 405.5.2(1). Table 405.5.2(1) shall include by reference all notes contained in Table 402.1.1. | (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | | | | |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities. | Calculation procedures used to comply with this section shall be software tools capable of calculating the annual energy consumption of all building elements that differ between the standard reference design and the proposed design and shall include the following capabilities: | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(1) | Calculation procedures ... and shall include the following capabilities:<br>1. Computer generation of the standard reference design using only the input for the proposed design. The calculation procedure shall not allow the user to directly modify the building component characteristics of the standard reference design. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(2) | Calculation procedures ... and shall include the following capabilities:<br>2. Calculation of whole-building (as a single zone) sizing for the heating and cooling equipment in the standard reference design residence in accordance with Section M1401.3 of the International Residential Code. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(3) | Calculation procedures ... and shall include the following capabilities:<br>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. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.1 Minimum capabilities.(4) | Calculation procedures ... and shall include the following capabilities:<br>4. Printed code official inspection checklist listing each of the proposed design component characteristics from | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section | - | - | - | - |

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| | | | | Table 405.5.2(1) determined by the analysis to provide compliance, along with their respective performance ratings (e.g., R-value, U-factor, SHGC, HSPF, AFUE, SEER, EF, etc.). | 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | | | | |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.2 Specific approval. | Performance analysis tools meeting the applicable sections of Section 405 shall be permitted to be approved. Tools are permitted to be approved based on meeting a specified threshold for a jurisdiction. The code official shall be permitted to approve tools for a specified application or limited scope. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or 2006 IECC Section 506.2 through 506.5, applied as defined in the 2006 IECC, is required. | - | - | - | - |
| Residential Energy Efficiency | Simulated Performance Alternative | Performance | 405.6 Calculation software tools. 405.6.3 Input values. | When calculations require input values not specified by Sections 402, 403, 404 and 405, those input values shall be taken from an approved source. | 702.2 Energy cost performance levels (Performance Path). Energy efficiency features are implemented to achieve energy cost performance that exceeds the 2006 IECC by the following. A documented analysis using software in accordance with 2006 IECC, Section 404, or IECC Section 506.2 through 506.5, applied as defined in the IECC, is required. | - | - | - | - |

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