

## **SIGNIFICANT CHANGES to the 2024 IECC - Residential Provisions**

### Chapter R1 Admin Provisions

**R101.3** New Intent: The IECC—Residential Provisions provide market-driven, enforceable requirements for the design and construction of residential buildings, providing minimum efficiency requirements for buildings that result in the maximum level of energy efficiency that is safe, technologically feasible, and life cycle cost-effective, considering economic feasibility, including potential costs and savings for consumers and building owners, and return on investment. Additionally, the code provides jurisdictions with optional supplemental requirements, including requirements that lead to achievement of zero energy buildings, presently, and, through glidepaths that achieve zero energy buildings by 2030 and on additional timelines sought by governments, and achievement of additional policy goals as identified by the Energy and Carbon Advisory Council and approved by the Board of Directors. The code may include nonmandatory appendices incorporating additional energy efficiency and greenhouse gas reduction resources developed by the International Code Council and others. Requirements contained in the code will include, but not be limited to, prescriptive- and performance-based pathways. The code will aim to simplify code requirements to facilitate the code’s use and compliance rate. The code is updated on a 3-year cycle with each subsequent edition providing increased energy savings over the prior edition. The IECC residential provisions shall include an update to Chapter 11 of the International Residential Code. This code is intended to provide flexibility to permit the use of innovative approaches and techniques to achieve this intent. This code is not intended to abridge safety, health or environmental requirements contained in other applicable codes or ordinances.

**R104.1.1** clarifies when you can call a program an above code program, looking at the total building thermal envelope thermal conductance using equation 1-1 based on climate zone.

**R107.4** expands on the provisions for approved third party inspection agencies, spelling out their need to be independent agencies with adequate equipment to perform inspections and tests with trained and credentialed personnel.

### Chapter R2 Definitions

#### **New Definitions:**

1. Air handling unit
2. Approved source
3. Automatic shutoff control
4. Balanced ventilation system
5. Biodiesel blend
6. Common areas
7. Construction documents
8. Continuous pilot
9. Damper

10. Demand Response Signal
11. Demand Responsive Control
12. Distribution system efficiency (DSE)
13. Ductwork
14. Emittance
15. Enclosed Reflective Airspace
16. Energy Rating Index
17. Existing Building
18. F-Factor (Thermal Transmittance)
19. Fuel Gas
20. Fuel Oil
21. Grade Plane
22. Heat Exchanger
23. Intermittent Ignition
24. Interrupted Ignition
25. Knee Wall
26. Liquid Fuel
27. Living Space
28. Low slope
29. Occupiable space
30. On-demand pilot
31. Plenum
32. Radiant Barrier
33. Reflective Insulation
34. Simulated Building Performance
35. Sleeping Unit
36. Solar Ready Zone
37. Space Conditioning
38. Space Conditioning Equipment
39. Steep Slope
40. Substantial Improvement
41. Work Area

**Revised Definitions:**

1. Duct System
2. Rated Design
3. Roof Replacement
4. Testing Unit Enclosure Area replaces Dwelling Unit Enclosure Area

## Chapter R3 General Requirements

**R303.1.6 and R303.2.2** provisions for radiant barrier and reflective airspace installation requirements were brought into the General Requirements.

## Chapter R4 Energy Efficiency

### *R401 General*

**R401.2.1** Now only the Prescriptive path of compliance must comply with R408 additional efficiency requirements.

**R401.2.2** Total Building Performance is changed back to Simulated Building Performance

### *R402 Building Thermal Envelope*

**R402.1.5** Total UA Alternative now becomes Component Performance Alternative just like commercial. Brings in F factor so that slabs can be traded off again. Also allows the option to get assembly U- factors and F-factors from ASHRAE 90.1 Appendix A. R402.2.10 Slab-on-grade floors was changed to exempt slabs that are 24” or more below grade (used to be 12”), and slabs complying with simulated performance or ERI paths.

**R402.3** does not require radiant barriers but clarifies that if you install them, they must be installed according to ASTM C1743.

**R402.5** Air leakage testing (maximum air leakage rate):

1. Prescriptively, CZ 0-2 = 4 ACH/50; CZ 3-5 = 3 ACH/50; CZ6-8 = 2.5 ACH/50
2. Performance or ERI: All CZs = 4 ACH/50 or 0.22 CFM/SQFT of building thermal envelope area or dwelling testing unit enclosure area.
3. Exceptions for attached housing and houses under 1500 SQFT of conditioned floor area (CFA) to be 0.27 CFM/SQFT/testing unit enclosure area.
4. Provisions for sampling for buildings with eight or more units to be tested.

### *R403 Systems*

**R403.3.4** Brought in more clarification for when ductwork (changed the word ducts everywhere to ductwork) is considered to be inside the conditioned space.

**R403.3.5** Added provisions for supply ductwork in unvented attics that have vapor diffusion ports in Climate Zones 0-3A. Also, added a reminder that air permeable insulation installed in unvented attics must comply with Section R806.5 of the IRC.

**R403.3.7** Duct system testing brought back the exception for ducts entirely within conditioned space but only if there is no more than 10 feet of total ductwork external to the space conditioning equipment. Also, changed max leakage rate to 3 cfm if equipment isn’t installed yet.

**R403.3.8** The amount of duct leakage allowed once equipment is installed now depends on equipment and duct configuration, whether the duct system serves more than 1000 SQFT of CFA or 1000 SQFT of CFA or less, and the number ducted returns. Also, clarifies that the amounts are for Total Duct Leakage (TDL) and not Leakage to Outside (LTO) when using prescriptive paths of compliance.

**R403.3.9** Allows sampling for ductwork testing in buildings with eight or more dwelling units.



**R403.6.1** Now climate zones 6 (new), 7, and 8 must have heat recovery or energy recovery ventilation systems. They must be a balanced ventilation system with a sensible recovery efficiency of at least 65% at 32 degrees.

**R403.6.4** Now allows for sampling of the mechanical ventilation system testing for buildings with eight or more dwelling units or sleeping units.

**R403.6.5** Intermittent exhaust control for bathrooms and toilet rooms. Clarifies how controls must work if they are designed for intermittent operation. Must be time control, occupant sensor control, humidity control, or contaminant control with exception for systems serving as the whole house mechanical ventilation system.

**R403.7.1** puts limits on the installed heating capacity for all electric-resistance space heating serving one- and two-family dwellings and townhouses in CZ 4-8.

#### *R404 Electrical Power, Lighting and Renewable Energy Systems*

R404 becomes Electrical Power, Lighting And Renewable Energy Systems instead of Electrical Power and Lighting Systems.

**TABLE R404.1** Brings in watt/sq ft lighting power allowance for exteriors like in commercial.

**R404.1.1** Brings in exterior lighting power requirements but then exempts almost everything out of the requirement except maybe R-2, and R-4.

**R404.2.1** Interior lighting has dimmer or auto off controls for “habitable spaces”

**R404.2.2** Garages, unfinished basements, laundry rooms and utility rooms have auto off within 20 minutes of occupants leaving a space

**R404.4** REC documentation states that where renewable energy generation is used to comply with this code, documentation must be turned in that demonstrates where RECs or Energy attributable certificates (EACs) are associated with that portion of renewable energy used to comply then the RECs or EACs shall be retained or retired on behalf of the property owner. They don’t transfer.

#### *R405 Simulated Building Performance*

**R405.2** does bring in a type of penalty for fuel burning appliances used for space heating or water heating by saying that the annual energy cost of the dwelling unit shall be less than or equal to 80% of the annual energy cost of the standard reference design. Everything else must be at 85%. Also, each dwelling unit greater than 5000 sq ft of living space above grade must reduce the annual energy cost an additional 5% of the standard reference design. (This Section was not part of the removal of the building electrification proposals that were removed by ICC Board of Directors after the appeals process, likely just missed, but it cannot be handled as an erratum and must go through the 2027 code cycle to be fixed so a jurisdiction would need to amend it if they felt that it should be taken out. However, Colorado State Law does not allow a jurisdiction to amend a code to be less restrictive than the published version so you would need to show how the full code, once amended, is not less restrictive.)

### **R405.5.2**

Software tools now must be tested by the software vendor in accordance with ASHRAE standard 140 and publish their test results on a public website.

#### *R406 Energy Rating Index Compliance Alternative*

**R406.1 Scope** Reads confusingly by stating that this path is limited to dwelling units and then goes on to say that if you are anything other than a dwelling unit in a Group R-2, R-3 or R-4 building, you have to use the prescriptive path and cannot use ERI, or any other path for that matter. There are no R-2, R-3, or R-4 occupancies in the IRC, only the IBC so this looks to say that homes built out of the IRC cannot use this path.

It is believed that this wording was really meant to say that if you have a space that is not a dwelling unit within an R-2, R-3 or R-4 building, then that space must go prescriptive. (An erratum has been submitted to state that “...Analysis shall be limited to dwelling units in residential buildings.” *And then leave the rest to show that spaces other than dwelling units go prescriptive.*)

**R406.3** ERI has new backstop using a multiplier to get a max building thermal envelope thermal conductance using the prescriptive U- and F-factors from the U factor table, based on climate zone. Also, this gives a max SHGC of 0.30 for climate zones 0-3.

**R406.5** ERI Gives a rating required with or without Onsite Power Production (OPP) based on climate zones.

#### *R408 Additional Efficiency Requirements*

**R408.2** Additional Efficiency Requirements gets changed to a point system requiring 10 credits from at least 2 measures. Requires 5 additional credits if a dwelling unit is over 5000 sq ft of area. Measures include thermal envelope performance, roof solar reflectance, air leakage, heat pumps, high performance HVAC and water heating systems, appliances, lighting controls, ERV or HRV installed, renewable energy and demand responsive thermostat. R401.2 now has these additional efficiency requirements only applying to buildings using the prescriptive path of compliance. The Simulated Performance path has a 15% better proposed design to make up for not using this section and the ERI path has a lower score required instead of requiring this section.

## Chapter R5 – Existing Buildings

**R502** Requires additions to comply with R408.2 and get at least 5 credits. There are exceptions.

**R503.1.1.2** New section on Roof, ceiling and attic alterations that specifies when the insulation requirements must be met.

**R503.1.1.3** Large change in above grade wall alterations and when they must comply.

1. Existing exposed cavities need to be filled.



2. New cavities meet new requirements
3. Adding exterior wall coverings and fenestration requires either continuous insulation being added or at least an R-value added to bring the wall into compliance with today's values, or an approved design that minimizes deviation from today's U-factors.

**R503.1.1.6** Air barrier is required to be provided but not continuous.

**R503.1.2.2** Requires new heating and cooling equipment that is part of an alteration to be sized properly.

**R503.1.2.3** When ductwork increases by 25% as it relates to registers installed, total length of duct system or relocation of ducts, duct leakage testing required to meet 12 cfm/100sqft of CFA.

## Appendices

Maintains appendices RA board of appeals, RB solar ready provisions, and RC Zero Net Energy Residential Building Provisions.

- Added appendices:
  - RD electric energy storage provisions
  - RE electric vehicle charging infrastructure
  - RF Alternative Building Thermal Envelope Insulation R Value Options
  - RG 2024 IECC Stretch Code
  - RH Operational Carbon Rating and Energy Reporting
  - RI On site renewable energy
  - RJ Demand Responsive controls
  - RK Electric ready residential building provisions
  - RL Renewable Energy Infrastructure
- Added Resource RRA all electric residential buildings.