

**Amendments to the 2021  
International Energy Conservation Code**

\* **Amendments Specific to the City of Murphy**

\*\* **NCTCOG Recommended Amendment**

\*\*\* **Modified NCTCOG Recommended Amendment**

**\*\*Section C102/R102; add Section C102.1.2 and R102.1.2 to read as follows:**

**C102.1.2 Alternative compliance.** A building certified by a national, state, or local accredited energy efficiency program and determined by the Energy Systems Laboratory to be in compliance with the energy efficiency requirements of this section may, at the option of the Code Official, be considered in compliance. The United States Environmental Protection Agency's Energy Star Program certification of energy code equivalency shall be considered in compliance.

**R102.1.2 Alternative compliance.** A building certified by a national, state, or local accredited energy efficiency program and determined by the Energy Systems Laboratory to be in compliance with the energy efficiency requirements of this section may, at the option of the Code Official, be considered in compliance. The United States Environmental Protection Agency's Energy Star Program certification of energy code equivalency shall be considered in compliance. Regardless of the program or the path to compliance, each 1- and 2-family dwelling shall be tested for air and duct leakage as prescribed in Section R402.4.1.2 (N1102.4.1.2) and R403.3.3 (N1103.3.3) respectively.

**\*\*Section 105.2 Required Inspections; Changed numbering and to read as follows:**

**R105.2.1 Footing and foundation inspection.** Inspections associated with footings and foundations shall verify compliance with the code as to R-value, location, thickness, depth of burial and protection of insulation as required by the code and approved plans and specifications.

**R105.2.2 Framing and Air Barrier rough-in inspection.** Inspections at framing and rough-in shall be made before application of insulation and shall verify compliance with the code as to: air leakage controls as required by the code; and approved plans and specifications.

**R105.2.3 Insulation and Fenestration rough-in inspection.** Inspections at framing and rough-in shall be made before application of interior finish and shall verify compliance with the code as to: types of insulation and corresponding R-values and their correct location and proper installation; fenestration properties such as U-factor and SHGC and proper installation.

**R105.2.4 Plumbing rough-in inspection.** Inspections at plumbing rough-in shall verify compliance as required by the code and approved plans and specifications as to types of insulation and corresponding R-values and protection and required controls.

**R105.2.5 Mechanical rough-in inspection.** Inspections at mechanical rough-in shall verify compliance as required by the code and approved plans and specifications as to installed HVAC equipment type and size, required controls, system insulation and corresponding R-value, system air leakage control, programmable thermostats, dampers, whole-house ventilation, and minimum fan efficiency.

Exception: Systems serving multiple dwelling units shall be inspected in accordance with Section C105.2.4.

**R105.2.6 Final inspection.** The building shall have a final inspection and shall not be occupied until approved. The final inspection shall include verification of the installation of all required building systems, equipment and controls and their proper operation and the required number of high-efficacy lamps and fixtures.

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**\*\*Section C102/R102 General; add Section C102.1.2 and R102.1.2 (N1101.4.1) to read as follows:**

**Section R202 (N1101.6) Definitions; add the following definition:**

**PROJECTION FACTOR.** The ratio of the horizontal depth of the overhang, eave or permanently attached shading device, divided by the distance measured vertically from the bottom of the fenestration glazing to the underside of the overhang, eave or permanently attached shading device.

**\*\*Section R202 (N1101.6) Definitions; add the following definition:**

**DYNAMIC GLAZING.** Any fenestration product that has the fully reversible ability to change its performance properties, including U-factor, solar heat gain coefficient (SHGC), or visible transmittance (VT).

**Table 402.1.2 Maximum Assembly/Climate Zone items: amend table as follows:**

| Climate Zone | Fenestration U-Factor <sup>f</sup> | Ceiling U-Factor |
|--------------|------------------------------------|------------------|
| 2            | .40                                | 0.29             |
| 3            | 0.32                               | 0.29             |

**Table 402.1.3 Insulation/Climate Zone items: amend table as follows.**

| Climate Zone | Fenestration U-Factor <sup>b,i</sup> | Ceiling R-Value | Wood Frame Wall R-Value | Slab R-Value & Depth |
|--------------|--------------------------------------|-----------------|-------------------------|----------------------|
| 2            | .40                                  | 42              | 13 or 0 + 10            | 0                    |
| 3            | 0.32                                 | 42              | 19 or 13+3ci,<br>0+15   | 0                    |

**\*\*Section C402.5.2 Dwelling and sleeping unit enclosure testing. Added the underlined to read as follows:**

**C402.5.2 Dwelling and sleeping unit enclosure testing.** The building thermal envelope shall be tested in accordance with ASTM E779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the code official. The measured air leakage shall not exceed 0.30 cfm/ft<sup>2</sup> (1.5 Us m<sup>2</sup>) of the testing unit enclosure area at a pressure differential of 0.2 inch water gauge (50 Pa). Where multiple dwelling units or sleeping units or other occupiable conditioned spaces are contained within one building thermal envelope, each unit shall be considered an individual testing unit, and the building air leakage shall be the weighted average of all testing unit results, weighted by each testing unit's enclosure area. Units shall be tested separately with an unguarded blower door test as follows:

1. Where buildings have fewer than eight testing units, each testing unit shall be tested.
2. For buildings with eight or more testing units, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations.

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**\*\*Section R402.4.1 Building thermal envelope; add section R402.4.1.4 to read as follows:**

**R402.4.1.4 Sampling options for R2 multifamily dwelling units.** For buildings with eight or more testing units that must be tested as required by R402.4.1.2 or R402.4.1.3, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a

middle floor unit, and a unit with the largest testing unit enclosure area. For each tested unit that exceeds the maximum air leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

**\*\*Section R403.3 Ducts; add section R403.3.8 to read as follows:**

**R403.3.8 Sampling options for R2 multifamily dwelling units.** For buildings with eight or more testing units that must be tested as required by R403.3.5, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit floor area. For each tested unit that exceeds the maximum duct leakage rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

**\*\*Section R403.6 Mechanical Ventilation; add section R403.6.4 to read as follows:**

**R403.6.4 Sampling options for R2 multifamily dwelling units.** For buildings with eight or more testing units that must be tested as required by R403.6.3, the greater of seven units or 20 percent of the testing units in the building shall be tested, including a top floor unit, a ground floor unit, a middle floor unit, and a unit with the largest testing unit floor area. For each tested unit that does not meet the minimum ventilation rate, an additional three units shall be tested, including a mixture of testing unit types and locations. Where buildings have fewer than eight testing units, each testing unit shall be tested.

**R405.2 Performance-based compliance. Added to underlined to read as follows.**

R405.2 Performance-based compliance. Compliance based on total building performance requires that a proposed design meets all of the following:

1. The requirements of the sections indicated within Table R405.2.
2. The building thermal envelope greater than or equal to levels of efficiency and solar heat gain coefficients in Table R402.1.1 or R402.1.3 of the 2009 International Energy Conservation Code.
3. An annual energy cost that is less than or equal to the annual energy cost of the 2021 standard reference design or 8% less than the annual energy cost of the 2018 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 Data System Prices and Expenditures reports. Code officials shall be permitted to require time-of-use pricing in energy cost calculations.

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.

**\*\*Section R401.2.5 Additional Energy efficiency: DELETE**

**\*\*Section R408 ADDITIONAL EFFICIENCY PACKAGE OPTIONS: DELETE**

**\*\*Section R402.4.6 Electrical and Communication outlet boxes. DELETE after the first sentence to read as follows:**

**R402.4.6 Electrical and communication outlet boxes (air-sealed boxes).** Electrical and communication outlet boxes installed in the building thermal envelope shall be sealed to limit air leakage between conditioned and unconditioned spaces.

**\*\*Section R404.2 Interior Lighting Controls: DELETE**

**(Table R406.6 Table R406.6 (N1106.4) Is on the following page. The rest of this page is intentionally left blank.)**

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**\*\*TABLE R406.4 (N1106.4) MAXIMUM ENERGY RATING INDEX; amend to read as follows:**

**TABLE R406.4 (N1106.4) <sup>1</sup>  
MAXIMUM ENERGY RATING INDEX**

| <b>CLIMATE ZONE</b> | <b>ENERGY RATING INDEX</b> |
|---------------------|----------------------------|
| 2                   | 63                         |
| 3                   | 63                         |

<sup>1</sup> This table is effective until August 31, 2022.

**TABLE R406.4 (N1106.4) <sup>2</sup>  
MAXIMUM ENERGY RATING INDEX**

| <b>CLIMATE ZONE</b> | <b>ENERGY RATING INDEX</b> |
|---------------------|----------------------------|
| 2                   | 59                         |
| 3                   | 59                         |

<sup>2</sup> The table is effective from September 1, 2022 to August 31, 2025.

**TABLE R406.4 (N1106.4) <sup>3</sup>  
MAXIMUM ENERGY RATING INDEX**

| <b>CLIMATE ZONE</b> | <b>ENERGY RATING INDEX</b> |
|---------------------|----------------------------|
| 2                   | 57                         |
| 3                   | 57                         |

<sup>3</sup> The table is effective from September 1, 2025 to August 31, 2028.

**TABLE R406.4 (N1106.4) <sup>3</sup>  
MAXIMUM ENERGY RATING INDEX**

| <b>CLIMATE ZONE</b> | <b>ENERGY RATING INDEX</b> |
|---------------------|----------------------------|
| 2                   | 55                         |
| 3                   | 55                         |

<sup>4</sup> This table is effective on or after September 1, 2028.