

# REPI-150-21 (Modification)

IECC®: R503.1.1, R503.1.1.1, R503.1.1.2 (N1111.1.1.2) (New), 503.1.1.3 (N1111.1.1.3) (New), R503.1.1.4 (N1111.1.1.4) (New), R503.1.1.5 (N1111.1.1.5) (New), R503.1.1.6 (N1111.1.1.6) (New)

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## 2021 International Energy Conservation Code

### REMAINDER OF ORIGINAL PROPOSAL UNCHANGED

**Add new definitions as follows:**

**APPROVED SOURCE.** An independent person, firm or corporation, approved by the *building official*, who is competent and experienced in the application of engineering principles to materials, methods or systems analyses.

**CONSTRUCTION DOCUMENTS.** Written, graphic and pictorial documents prepared or assembled for describing the design, location and physical characteristics of the elements of a project necessary for obtaining a building *permit*.

**Revise existing definition as follows:**

**ROOF REPLACEMENT.** The process of removing the existing *roof covering*, repairing any damaged substrate and installing a new *roof covering*. An alteration that includes the removal of all existing layers of roof assembly materials down to the roof deck and installing replacement materials above the existing roof deck.

**Modify Section R503.1.1.2 of REPI-150 as follows:**

**R503.1.1.2 (N1111.1.1.2) Roof alterations.** Roof insulation complying with Section R402.1 or an *approved* design shall be provided for the following roof alteration conditions as applicable:

1. An *alteration* to roof-ceiling construction where sheathing or insulation is exposed during *reroofing* and the roof assembly has there is no insulation and is above *conditioned space*,
2. *Roof replacement* for roofs with insulation entirely above deck,

**Exception:** Where compliance with Section R402.1 cannot be met due to limiting conditions on an existing roof, the following shall be permitted to demonstrate compliance with the insulation requirements:

1. *Construction documents* that include a report by a registered design professional or other *approved source* documenting details of the limiting conditions affecting compliance with the insulation requirements.
2. *Construction documents* that include a roof design by a registered design professional or other *approved source* that minimizes deviation from the insulation requirements.
3. Conversion of an unconditioned attic space into *conditioned space*, and
4. Replacement of ceiling finishes exposing cavities or surfaces of the roof-ceiling construction *assembly* to which insulation can be applied.

**Add a new footnote to Tables R402.1.2 and Table R402.1.3 as follows (portions of tables not shown are unchanged):**

**TABLE R402.1.2  
MAXIMUM ASSEMBLY U-FACTORS<sup>a</sup> AND FENESTRATION REQUIREMENTS**

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>f</sup>	SKYLIGHT U-FACTOR	GLAZED FENESTRATION SHGC <sup>d,e</sup>	CEILING U-FACTOR <sup>g</sup>	WOOD FRAME WALL U-FACTOR	MASS WALL U-FACTOR <sup>b</sup>	FLOOR U-FACTOR	BASEMENT WALL U-FACTOR	CRAWL SPACE WALL U-FACTOR
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g. Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the "Group R" U-factors of Table C402.1.4.

**TABLE R402.1.3  
INSULATION MINIMUM R-VALUES AND FENESTRATION REQUIREMENTS BY COMPONENT<sup>a</sup>**

CLIMATE ZONE	FENESTRATION U-FACTOR <sup>b,i</sup>	SKYLIGHT <sup>b</sup> U-FACTOR	GLAZED FENESTRATION SHGC <sup>b,e</sup>	CEILING R-VALUE <sup>j</sup>	WOOD FRAME WALL R-VALUE <sup>g</sup>	MASS WALL R-VALUE <sup>h</sup>	FLOOR R-VALUE	BASEMENT <sup>c,g</sup> WALL R-VALUE	SLAB <sup>d</sup> R-VALUE & DEPTH	CRAWL SPACE <sup>c,g</sup> WALL R-VALUE
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...  
j. Roofs with insulation entirely above deck shall comply with Section C402.2.1 and the "Group R" R-values of Table C402.1.3.

**Reason (MODIFICATIONS ONLY):** This proposed modification to REPI-150 coordinates with action taken on CEPI-225 in the commercial envelope subcommittee by revising proposed Section R503.1.1.2 on roof alterations to provide flexibility in conducting

roof replacements for roofs with insulation entirely above deck (Item 2). CEPI 225 and CEPI-17 Part I (also approved by the commercial envelope subcommittee) provided three definitions that are also included in this modification of REPI-150 since these terms are relevant to this modification and the original REPI-150 proposal. These modifications deal primarily with existing roofs with insulation entirely above deck (e.g., typical low-slope roofs). This is aimed at low-rise multifamily buildings that fall under the IECC-Residential scope of provisions. Many of these buildings are like their taller commercial Group R building counterparts and differ only the allowed number of stories (not roof size or type or energy use characteristics). Therefore, a footnote is added to the R-value and U-factor tables since this type of roofing system is not addressed in the residential energy provisions and is needed for both new buildings as well as roof replacements on existing buildings that have insulation entirely above the roof deck.

Finally, Item 1 of Section R503.1.1.2 is revised by this modification. Item 1 is focused on addressing roofs in existing buildings that have no roof insulation at all. Item 1 is based on the REPI-150 proposal's deletion and moving of Exception #5 into Section 503.1.1.2 (mainly because Exception #5 is actually a requirement and not an exception -- see original REPI-150 proposal). However, the requirement was triggered based on "re-roofing" which by definition includes roof recovers that remain globally exempted in Exception 4 of Section R503.1.1. Thus, it was conflicted in the existing code's Exception #5 to Section R503.1.1 and in REPI-150's moving of that exception to Item 1 of Section R503.1.1.2. It also included a trigger based on "exposed insulation" but the requirement (and prior exception) assumes there is no roof insulation as a condition, so there is no way roof insulation could be exposed by re-roofing or any other type of roof alteration. Consequently, the trigger for addressing roofs with no insulation is revised by this modification to be based on a roof alteration (which may be a structural change, an interior finish change, etc.). This removes the criteria from being based purely on a roof replacement which is too narrowly focused or on re-roofing which is in conflict with the exemption for roof recovers. In addition, the modification uses the term "roof-ceiling construction" (where not specifically addressing roofs with insulation entirely above deck) to be consistent with terminology used in the IRC Chapter 8 Roof-Ceiling Construction.

**Cost Impact (MODIFICATIONS ONLY):** The modification will reduce the cost of construction compared to the original proposal. The exception language for roof replacements with insulation entirely above deck creates a reasonable means to address this type of roof replacement with flexibility and cost-effectiveness where needed to address limiting conditions that may prevent full compliance with insulation requirements for new construction. Where there are no limiting conditions or to the extent they can be addressed, the roof replacement can bring the roof up to current code for new construction. This modification will promote practical improvements to existing roofs with inadequate insulation entirely above deck or with no existing roof insulation at all.

**PLEASE REFER TO THE ORIGINAL REPI-150 PROPOSAL FOR UNCHANGED PORTIONS AND FOR THE ORIGINAL REASON STATEMENT.**