2021 I-CODES

COMMERCIAL BUILDING LOW-SLOPE REROOFING PROJECTS

Energy Code Compliance Checklist

Based on the 2021 Editions of the International Building Code (IBC) and the International Energy Conservation Code (IECC)

DISCLAIMER

This document is intended to provide general guidance only for reroofing projects on commercial buildings with low-slope roofs and is based on the 2021 editions of the IBC and IECC model codes. Designers and project teams should always consult the building codes enforced by the local authority having jurisdiction. Building materials shall be installed in accordance with manufacturer installation instructions.

Project Location

Property Name/ID _____

Property Address _____

City _____ State _____ Zip Code _____

Project Information

ASHRAE Climate Zone _____

Occupancy Type (Commercial)	Group R ☐	All Other ☐	
Roof Slope	< 2:12 ☐	≥ 2:12 ☐	
Reroofing Project Type	Repair ☐	Recover ☐	Replacement ☐

IMPORTANT NOTE

Roof repairs and *roof recovers* are exempt from compliance with the IECC insulation requirements provided the energy use of the building is not increased (see IECC Section C503.1).

Requirements for New Roof Assembly Installed as Part of Roof Replacement

IMPORTANT NOTE

The requirements listed below are applicable to *roof replacements* only. This checklist is primarily designed to assist with the review of replacement low-slope (< 2:12) roof assemblies that contain insulation entirely above the roof deck. Metal Building and Attic and Other roof construction types are not addressed in this checklist.

Roof Insulation

QUESTION 1

Does the existing roof assembly contain insulation entirely above roof deck? Yes ☐ No ☐

REQUIREMENT

If **YES** to Question 1, the new roof assembly is required to meet the opaque thermal envelope insulation component minimum R-value requirements in IECC Table C402.1.3 **OR** the opaque thermal envelope assembly maximum U-factor requirements in IECC Table C402.1.4 (see IECC Section C503.2.1). Complete the table below based on the selected compliance path.

Enter requirement based on selected compliance path (R-value or U-factor) and Climate Zone.	
Minimum Required Insulation R-value per IECC Table C402.1.3	R-value _____
Maximum Required Assembly U-factor per IECC Table C402.1.4	U-factor _____

If **NO** to Question 1, skip to "Roof Cover Board" below.

IMPORTANT NOTE

State-by-state fact sheets detailing the minimum insulation requirements for low-slope (< 2:12) commercial building roofs with insulation entirely above the roof deck (for both new and existing buildings) are available at: https://www.polyiso.org/page/energy-code-by-state.

Tapered Insulation

QUESTION 2

Does the new roof assembly include tapered insulation? Yes ☐ No ☐

REQUIREMENT

If **YES** to Question 2, where used as a component of a roof/ceiling assembly R-value calculation, the sloped roof insulation R-value contribution to that calculation shall use the average thickness in inches (mm) along with the material R-value-per-inch (per-mm) solely for the R-value compliance as prescribed in IECC Section C402.1.3 (see IECC Section C402.2.1.1).

If **NO** to Question 2, skip to "Roof Cover Board" below.

Roof Cover Board

QUESTION 3

Does the new roof assembly include a high-density (HD) polyiso roof cover board? Yes ☐ No ☐

OPTION

If **YES** to Question 3, the labeled R-value of the HD polyiso roof cover board can count toward the opaque thermal envelope insulation component minimum R-value requirements in IECC Table C402.1.3. Other roof cover board types that have rated R-values as insulation may contribute to the minimum R-value requirements as well. Roof cover board types that do not have rated R-values as insulation may contribute to the opaque thermal envelop assembly maximum U-factor requirements in IECC Table C402.1.4.

If **NO** to Question 3, skip to "Roof Solar Reflectance" below.

Roof Solar Reflectance (Membrane)

QUESTION 4

Is the project located in ASHRAE Climate Zone 0, 1, 2 or 3? Yes ☐ No ☐

QUESTION 5

Is the roof a low-sloped roof (< 2:12)? Yes ☐ No ☐

QUESTION 6

Is the roof above a cooled conditioned space? Yes ☐ No ☐

REQUIREMENT

If **YES** to Questions 4, 5 **AND** 6, a new roof assembly is required to meet the minimum roof solar reflectance and thermal emittance requirements of IECC Table C402.3. Exemptions for roofs and portions of roofs are permitted per the list specified in IECC Section C402.3 (see IECC Section C503.2).

If **NO** to Questions 4, 5 **OR** 6, the checklist is complete.

Key Definitions from the 2021 Editions of the I-Codes

BUILDING THERMAL ENVELOPE

The basement walls, exterior walls, floors, ceilings, roofs and any other building element assemblies that enclose *conditioned space* or provide a boundary between *conditioned space* and exempt or unconditioned space.

LOW-SLOPED ROOF

A roof having a slope less than 2 units vertical in 12 units horizontal.

REROOFING

The process of recovering or replacing an existing roof covering. See "Roof recover" and "Roof replacement."

ROOF ASSEMBLY

A system designed to provide weather protection and resistance to design loads. The system consists of a roof covering and roof deck or a single component serving as both the roof covering and the roof deck. A roof assembly can include *underlayment*, a thermal barrier, insulation or a *vapor retarder*.

ROOF RECOVER

The process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

ROOF REPAIR

Reconstruction or renewal of any part of an existing roof for the purpose of correcting damage or restoring pre-damage condition.

ROOF REPLACEMENT

The process of removing the existing roof covering, repairing any damaged substrate and installing a new roof covering.

2021 IBC – Key Code Provisions for Reroofing

1512.1 General

Materials and methods of application used for recovering or replacing an existing *roof covering* shall comply with the requirements of Chapter 15.

1512.2 Roof Replacement

Roof replacement shall include the removal of all existing layers of *roof assembly* materials down to the *roof deck*.

1511.3.1 Roof Recover

The installation of a new roof covering over an existing roof covering shall be permitted where any of the following conditions occur:

1. Where the new roof covering is installed in accordance with the roof covering manufacturer's approved instructions.
2. Complete and separate roofing systems, such as standing-seam metal roof panel systems, that are designed to transmit the roof loads directly to the building's structural system and that do not rely on existing roofs and roof coverings for support, shall not require the removal of existing roof coverings.
3. Metal panel, metal shingle and concrete and clay tile roof coverings shall be permitted to be installed over existing wood shake roofs when applied in accordance with Section 1512.3.
4. The application of a new protective roof coating over an existing protective roof coating, metal roof panel, built-up roof, spray polyurethane foam roofing system, metal roof shingles, mineral-surfaced roll roofing, modified bitumen roofing or thermoset and thermoplastic single-ply roofing shall be permitted without tear off of existing roof coverings.

1512.2.1.1 Exceptions

A *roof recover* shall not be permitted where any of the following conditions occur:

1. Where the existing roof or roof covering is water soaked or has deteriorated to the point that the existing roof or roof covering is not adequate as a base for additional roofing.
2. Where the existing roof covering is slate, clay, cement or asbestos-cement tile.
3. Where the existing roof has two or more applications of any type of roof covering.

2021 IECC – Key Code Provisions for Reroofing

C503.2 Building envelope

New building envelope assemblies that are part of the *alteration* shall comply with Section C402.1 through C402.5.

C503.2.1 Roof replacement

Roof replacements shall comply with Section C402.1.3, C402.1.4, C402.1.5 or C407 where the existing roof assembly is part of the *building thermal envelope* and contains insulation entirely above the roof deck. In no case shall the *R-value* of the roof insulation be reduced or the *U-factor* of the roof assembly be increased as part of the *roof replacement.*

C402.2.1.2 Minimum thickness, lowest point

The minimum thickness of above-deck roof insulation at its lowest point, gutter edge roof drain or scupper, shall be not less than 1 inch (25 mm).

C402.2.1.4 Joints staggered

Continuous insulation board shall be installed in not less than two layers and the edge joints between each layer of insulation shall be staggered, except where insulation tapers to the roof deck at the gutter edge, roof drain or scupper.

C402.3 Roof solar reflectance and thermal emittance

Low-sloped roofs directly above cooled conditioned spaces in *Climate Zones* 0 through 3 shall comply with one or more of the options in Table C402.3 [see IECC Section C402.3 for list of exceptions].

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