

Proposal Summary



2022 California Energy Code (Title 24, Part 6)

Nonresidential High Performance Envelope – Roof Alterations

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Introduction

The document summarizes proposed revisions to the California Energy Code (Title 24, Part 6) that will be discussed during a utility-sponsored stakeholder meeting on October 24, 2019. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email info@title24stakeholders.com by November 7, 2019.

Measure Description

The roof alterations submeasure requires low-slope roof alterations where insulation is exposed to insulate roofs to the full R-value required by Title 24, Part 6. This submeasure offers an opportunity to bring existing building stock up to current Title 24, Part 6 requirements.

Draft Code Language

The proposed changes to the Standards and Reference Appendices are provided below. Changes to the 2019 documents are marked with red underlining (new language) and ~~strikethroughs~~ (deletions). Expected sections or tables of the proposed code (but not specific changes at this time) are highlighted in yellow.

Standards

Section 100.1

ROOF is the outside cover of a building or structure including the structural supports, decking, and top layer that is exposed to the outside with a slope less than 60 degrees from the horizontal.

ROOF, LOW-SLOPED is a roof that has a ratio of rise to run of less than 2:12 (9.5 degrees from the horizontal).

ROOF, STEEP-SLOPED is a roof that has a ratio of rise to run of greater than or equal to 2:12 (9.5 degrees from the horizontal).

ROOFING PRODUCT is the top layer of the roof that is exposed to the outside, which has properties including but not limited to solar reflectance, thermal emittance, and mass.



ROOF RECOVER BOARD is a rigid type board, installed directly below a low-sloped roof membrane, with or without above deck thermal insulation, to: (a) improve a roof system's compressive strength, (b) physically separate the roof membrane from the thermal insulation, or (c) physically separate a new roof covering from an underlying roof membrane as part of a roof overlay project.

ROOF RECOVER is the process of installing an additional roof covering over a prepared existing roof covering without removing the existing roof covering.

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

Section 141.0(b)2B: Existing roofs being replaced, recovered or recoated, of a nonresidential, high-rise residential and hotels/motels shall meet the requirements of Section 110.8(i). Roofs with more than 50 percent of the roof area or more than 2,000 square feet of roof, whichever is less, is being altered the requirements of i through iii below apply:

- i. Roofing Products. Nonresidential buildings shall meet the requirements in 140.3 (a)1Ai:
 - a. ~~Low-sloped roofs in Climate Zones 1 through 16 shall have a minimum aged solar reflectance of 0.63 and a minimum thermal emittance of 0.75, or a minimum SRI of 75.~~
 - b. ~~Steep-sloped roofs in Climate Zones 1 through 16 shall have a minimum aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75, or a minimum SRI of 16.~~

EXCEPTION to Section 141.0(b)2Bia: An aged solar reflectance less than 0.63 is allowed provided the maximum roof/ceiling U-factor in TABLE 141.0-B is not exceeded.

- ii. Roofing Products. High-rise residential buildings and hotels and motels shall meet the requirements in 140.3 (a)1Aii:
 - a. ~~Low-sloped roofs in Climate Zones 10, 11, 13, 14 and 15 shall have a minimum aged solar reflectance of 0.55 and a minimum thermal emittance of 0.75, or a minimum SRI of 64.~~
 - b. ~~Steep-sloped roofs Climate Zones 2 through 15 shall have a minimum aged solar reflectance of 0.20 and a minimum thermal emittance of 0.75, or a minimum SRI of 16.~~

EXCEPTION 1 to Section 141.0(b)2Bi and ii: Roof area covered by building integrated photovoltaic panels and building integrated solar thermal panels are not required to meet the minimum requirements for solar reflectance, thermal emittance, or SRI.

EXCEPTION 2 to Section 141.0(b)2Bi and ii: Roof constructions with a weight of at least 25 lb/ft² are not required to meet the minimum requirements for solar reflectance, thermal emittance, or SRI.

Table 141.0-B Roof/Ceiling Insulation Tradeoff for Aged Solar Reflectance

Aged Solar Reflectance	Climate Zone 1, 3-9 U-factor	Climate Zone 2, 10-16 U-factor
0.62-0.60	0.075	0.052
0.59-0.55	0.066	0.048

0.54-0.50	0.060	0.044
0.49-0.45	0.055	0.041
0.44-0.40	0.051	0.039
0.39-0.35	0.047	0.037
0.34-0.30	0.044	0.035
0.29-0.25	0.042	0.034

Section 141.0(b)2Biii: For nonresidential buildings, high-rise residential buildings and hotels/motels, when low-sloped roofs are exposed to the roof deck or to the roof recover boards, and meets Section 141.0(b)2Bia or iia, the exposed area shall be insulated above the roof deck to the levels specified in TABLE 140.3-C ~~141.0-C~~.

EXCEPTION to Section 141.0(b)2Biii

a.—Existing roofs that are insulated with at least R-7 insulation or that has a U-factor lower than 0.089 are not required to meet the R-value requirement of TABLE ~~141.0-C~~.

b.—If mechanical equipment is located on the roof and will not be disconnected and lifted as part of the roof replacement, insulation added may be limited to the maximum insulation thickness that will allow a height of 8 inches (203 mm) from the roof membrane surface to the top of the base flashing.

c.—If adding the required insulation will reduce the base flashing height to less than 8 inches (203 mm) at penthouse or parapet walls, the insulation added may be limited to the maximum insulation thickness that will allow a height of 8 inches (203 mm) from the roof membrane surface to the top of the base flashing, provided that the conditions in Subsections i through iv apply:

i.—The penthouse or parapet walls are finished with an exterior cladding material other than the roofing covering membrane material; and

ii.—The penthouse or parapet walls have exterior cladding material that must be removed to install the new roof covering membrane to maintain a base flashing height of 8 inches (203 mm); and

iii.—For nonresidential buildings, the ratio of the replaced roof area to the linear dimension of affected penthouse or parapet walls shall be less than 25 square feet per linear foot for Climate Zones 2, and 10 through 16, and less than 100 square feet per linear foot for Climate Zones 1, and 3 through 9; and

iv.—For high-rise residential buildings, hotels or motels, the ratio of the replaced roof area to the linear dimension of affected penthouse or parapet walls shall be less than 25 square feet per linear foot for all Climate Zones.

d. Tapered insulation may be used which has a thermal resistance less than that prescribed in TABLE 140.3-C ~~141.0-C~~ at the drains and other low points, provided that the thickness of insulation is increased at the high points of the roof so that the average thermal resistance equals or exceeds the value that is specified in TABLE 140.3-C ~~141.0-C~~.

TABLE 141.0 C INSULATION REQUIREMENTS FOR ROOF ALTERATIONS

	Nonresidential		High-Rise Residential and Guest Rooms of Hotel/Motel Buildings	
Climate Zone	Continuous Insulation R-value	U-factor	Continuous Insulation R-value	U-factor
1	R-8	0.082	R-14	0.055
2	R-14	0.055	R-14	0.055
3-9	R-8	0.082	R-14	0.055
10-16	R-14	0.055	R-14	0.055

Reference Appendices