

# Proposal Summary



## 2022 California Energy Code (Title 24, Part 6)

### Single Family Energy Savings and Process Improvements for Additions and Alterations – Submeasure A: Prescriptive Changes

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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 November 12, 2019. The Statewide Utility Codes and Standards Enhancement (CASE) Team is seeking input and feedback. To provide your comments, email [info@title24stakeholders.com](mailto:info@title24stakeholders.com) by December 5, 2019.

#### Measure Description

This submeasure will identify opportunities for efficiency improvements by expanding existing requirements where appropriate. The following specific proposals will be considered.

- Expand the current prescriptive cool roof requirement for steep-slope roof alterations to Climate Zones 8 and 9.
- Expand the current prescriptive cool roof requirement for low-slope roof alterations to Climate Zones 8 through 12 and 14.
- Add a requirement in Climate Zones 2, 4, and 8 through 16 for R-49 attic insulation at time of steep-slope roof replacement.
- Add a requirement in Climate Zones 2, 4, and 8 through 16 for R-14 above deck continuous insulation at time of low-slope roof replacement.
- Add prescriptive requirement for R-49 attic insulation for altered ceilings in Climate Zones 2, 4, and 8 through 16.
- Increase prescriptive requirement for attic insulation in additions  $\leq 700$  square feet to R-38 from R-30 in Climate Zones 2, 4, and 8 through 10.
- Prohibit electric resistance heating replacement systems when the existing system is an electric furnace with central air conditioning.
- Prohibit electric resistance water heating replacement systems unless the existing system is an electric resistance water heater located within conditioned space or in an exterior closet.
- Increase prescriptive requirement for duct insulation for new ducts in an alteration to R-8 from R-6 in Climate Zones 1, 2, 4, 8 through 10, and 12 through 13.
- Reduce or remove the exception for duct sealing requirements when 40 feet or less of new or replacement ductwork is installed.



## 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 110.8 – MANDATORY REQUIREMENTS FOR INSULATION, ROOFING PRODUCTS AND RADIANT BARRIERS

(d) **Installation of Insulation in Existing Buildings.** Insulation installed in an existing attic, or on an existing duct or water heater, shall comply with the applicable requirements of Subsections 1, 2, and 3 below. If a contractor installs the insulation, the contractor shall certify to the customer, in writing, that the insulation meets the applicable requirements of Subsections 1, 2, and 3 below.

1. **Attics.** If insulation is installed in the existing attic of a low-rise residential building, the R-value of the total amount of insulation (after addition of insulation to the amount, if any, already in the attic) shall meet the requirements of Section ~~150.0(a)~~150.2(b)1.

**EXCEPTION to Section 110.8(d)1:** Where the accessible space in the attic is not large enough to accommodate the required R-value, the entire accessible space shall be filled with insulation provided such installation does not violate Section 1203.2 of Title 24, Part 2.

#### SECTION 150.2 – ENERGY EFFICIENCY STANDARDS FOR ADDITIONS AND ALTERATIONS TO EXISTING LOW-RISE RESIDENTIAL BUILDINGS

(a) **Additions.** Additions to existing low-rise residential buildings shall meet the requirements of Sections 110.0 through 110.9, Sections 150.0(a) through (q), and either Section 150.2(a)1 or 2.

1. **Prescriptive approach.** Additions to existing buildings shall meet the following additional requirements:

B. Additions that are 700 square feet or less shall meet the requirements of Section 150.1(c), with the following modifications:

- i. ~~Roof and~~ Ceiling insulation shall be installed in an ventilated attic with an R-value equal to or greater than shall be insulated to R38 in climate zones 1, 2, 4, 8~~11~~-16 or R-30 in climate zones 3, 5-7~~2-10~~ located between the attic and the conditioned space; and

(b) **Alterations.** Alterations to existing low-rise residential buildings or alterations in conjunction with a change in building occupancy to a low-rise residential occupancy shall meet either Item 1 or 2 below.

1. **Prescriptive approach.** The altered component and any newly installed equipment serving the alteration shall meet the applicable requirements of Sections 110.0 through 110.9 and all applicable requirements of Section 150.0(a) through (l); 150.0(m)1 through 150.0 (m)10, Section 150.0(o) through (q); and

A. **Ceiling Insulation.** Vented attics in Climate Zones 2, 4, and 8 through 16 shall be insulated to achieve a weighted U-factor of 0.020 or insulation shall be installed at the ceiling level resulting in an installed thermal resistance of R-49 or greater for the insulation alone. Where ceiling insulation is added to an existing vented attic, attic ventilation shall comply with CBC requirements.

**EXCEPTION 1 to Section 150.2(b)1Ai:** Buildings with at least R-38 existing insulation installed at the ceiling level.

**EXCEPTION 2 to Section 150.2(b)1Ai:** Buildings without attic access to the attic area.

**EXCEPTION 3 to Section 150.2(b)1Ai:** Buildings where the alteration that would directly cause the disturbance of asbestos, unless the alteration is made in conjunction with asbestos abatement.

**EXCEPTION 4 to Section 150.2(b)1Ai:** Buildings with knob and tube wiring located in the vented attic.

**EXCEPTION 5 to Section 150.2(b)1Ai:** Attics with limited vertical height that do not allow the installation of R-49 may install a lower R-value that maximizes the depth while still meeting code requirements including required air gaps.

- D. **Altered Duct Systems - Duct Sealing:** In all Climate Zones, when more than ~~XXX~~40 feet of new or replacement space-conditioning system ducts are installed, the ducts shall comply with the applicable requirements of subsections i and ii below. Additionally, when altered ducts, air-handling units, cooling or heating coils, or plenums are located in garage spaces, the system shall comply with subsection 150.2(b)1Diic regardless of the length of any new or replacement space-conditioning ducts installed in the garage space.
- i. New ducts located in unconditioned space shall meet the applicable requirements of Sections 150.0(m)1 through 150.0(m)11, and the duct insulation requirements of TABLE 150.2-A, and

TABLE 150.2-A DUCT INSULATION R-VALUE

Climate Zone	3, 5 through 7+ through 10, +12&+13	1, 2, 4, 8 through 16+1, +4 through +6
Duct R-Value	R-6	R-8

- G. **Altered Space-Conditioning System.** ~~Altered or r~~Replacement space-conditioning systems shall meet one of the following ~~be limited to natural gas, liquefied petroleum gas, or the existing fuel type.~~

- i. A natural gas or propane heating system; or
- ii. A heat pump.

**EXCEPTION to Section 150.2(b)1G:** If the heating system is a non-ducted system or is a ducted system without central air conditioning, an electric resistance heating system is allowed.

**EXCEPTION to Section 150.2(b)1G:** When the fuel type of the replaced heating system was natural gas or liquefied petroleum gas, the replacement space conditioning system may be a heat pump

- H. **Water-Heating System.** Altered or replacement service water-heating systems or components shall meet the applicable requirements below:

iii. **Water heating system.** The water heating system shall meet one of the following:

- a. A natural gas or propane water-heating system; or
- b. For Climate Zones 1 through 15, a single heat pump water heater. The storage tank shall not be located outdoors and be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of 110.12(a); or
- c. For Climate Zones 1 through 15, a single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher. The storage tank shall not be located outdoors; or
- d. If no natural gas is connected to the existing water heater location, one of the following: ~~a consumer electric water heater~~
- i. A single heat pump water heater; or
- ii. A consumer electric water heater if the water heater is located within conditioned space or in an exterior closet; or
- iii. A solar water-heating system meeting the installation criteria specified in Reference Residential Appendix RA4.20 and with a minimum solar savings fraction of XXX (value to be determined); or
- iv. A solar photovoltaic with a minimum capacity of XXX (value to be determined); or
- v. Grid interactive electric water heater (specs to be determined).

I. **Roofs.** Replacements of the exterior surface of existing roofs, including adding a new surface layer on top of the existing exterior surface, shall meet the requirements of Section 110.8 and the applicable requirements of Subsections i and ii where more than 50 percent of the roof is being replaced.

i. Low-rise residential buildings with steep-sloped roofs shall meet the following:

a. New roofing products in Climate Zones ~~8-10~~ 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 TO 150.2(b)1Iia:** The following shall be considered equivalent to Subsection i:

~~a. Air space of 1.0 inch (25 mm) is provided between the top of the roof deck to the bottom of the roofing product; or~~

~~b. The installed roofing product has a profile ratio of rise to width of 1 to 5 for 50 percent or greater of the width of the roofing product; or~~

~~c. Existing ducts in the attic are insulated and sealed according to Section 150.1(c)9; or~~

~~d. Buildings with at least R-38 ceiling insulation; or~~

e. Buildings with a radiant barrier in the attic and without skip sheathing meeting the requirements of Section 150.1(c)2; or

~~f. Buildings that have no ducts in the attic; or~~

g. ~~In Climate Zones 10-15,~~ R-2 or greater insulation above the roof deck.

b. Vented attics in Climate Zones 2, 4, and 8 through 16 shall be insulated to achieve a weighted U-factor of 0.020 or insulation shall be installed at the ceiling level resulting in an installed thermal resistance of R-49 or greater for the insulation alone. Where ceiling insulation is added to an existing vented attic, attic ventilation shall comply with CBC requirements.

**EXCEPTION 1 to Section 150.2(b)1Iib:** Buildings with at least R-38 existing insulation installed at the ceiling level.

**EXCEPTION 2 to Section 150.2(b)1Iib:** Buildings without attic access to the attic area.

**EXCEPTION 3 to Section 150.2(b)1Iib:** Buildings where the alteration that would directly cause the disturbance of asbestos, unless the alteration is made in conjunction with asbestos abatement.

**EXCEPTION 4 to Section 150.2(b)1Iib:** Buildings with knob and tube wiring located in the vented attic.

**EXCEPTION 5 to Section 150.2(b)1Iib:** Attics with limited vertical height that do not allow the installation of R-49 may install a lower R-value that maximizes the depth while still meeting code requirements including required air gaps.

**EXCEPTION 6 to Section 150.2(b)1Iib:** The following shall be considered equivalent to Subsection b:

i. A roof with a minimum aged solar reflectance of XXX and a minimum thermal emittance of 0.75 and with a radiant barrier in the attic meeting the requirements of Section 150.1(c)2; or

ii. A roof with a minimum aged solar reflectance of XXX and a minimum thermal emittance of 0.75; or

iii. R-X or greater continuous insulation installed above the roof deck.

ii. Low-rise residential buildings with low-sloped roofs shall meet the following:

- a. New roofing products Low-sloped roofs in Climate Zones ~~813~~ and through 15 shall have a 3-year aged solar reflectance equal or greater than 0.63 and a thermal emittance equal or greater than 0.75, or a minimum SRI of 75.
- b. Roofs in Climate Zones 2, 4, and 8 through 16 shall be insulated to achieve a weighted U-factor of 0.058 or continuous insulation shall be installed above the roof deck resulting in an installed thermal resistance of R-14 or greater for the insulation alone.

~~EXCEPTION 1 to Section 150.2(b)1iii: Buildings with no ducts in the attic.~~

**EXCEPTION 12 to Section 150.2(b)1iii:** The aged solar reflectance and continuous insulation at the roof deck may be traded off as is ~~can be met by using insulation at the roof deck~~ specified in TABLE 150.2-B.

TABLE 150.2-B AGED SOLAR REFLECTANCE INSULATION TRADE OFF TABLE [TO BE REFINED]

Aged Solar Reflectance	Roof Deck Insulation R-value	<del>Aged Solar Reflectance</del>	<del>Roof Deck Insulation R-value</del>
0.62-0.60	<del>2XXX</del>	0.44-0.40	12
0.59-0.55	<del>4XXX</del>	0.39-0.35	16
0.54-0.50	<del>6XXX</del>	0.34-0.30	20
0.49-0.45	<del>8XXX</del>	0.29-0.25	24