

Use this checklist when the project:

- Replaces, adds a new surface area on top of, or recoats the exterior surface of the existing roofing material — and nothing more.
**This checklist is not intended to support projects in which the enforcement agency requires building design plans and specifications to be submitted with the application for a building permit.*

ESSENTIALS

1. Does the project trigger California’s Building Energy Efficiency Standards (Title 24, Part 6)?

YES NO

- The project triggers Title 24, Part 6 (the Energy Code) if 50% or more of the roof is replaced, recoated or has a new surface layer added on top of it.
- If less than 50% of the roof is altered, it is considered a Repair and does not trigger the Energy Code.

2. Does it meet the Energy Code’s Requirements under the Prescriptive Approach?

YES NO

Prescriptive requirements for roofing material in Climate Zone 10 depend on roof type:

Roofing material	Meet these reflectance and emittance values		OR this SRI value
	Aged Solar Reflectance ^A	Thermal Emittance ^B	SRI ^C
• Steep-slope roof ^D – requires Cool Roof ^E	0.20 or higher	0.75 or higher	16 or higher
• Low-slope roof ^D – no Cool Roof ^E required	n/a	n/a	n/a

Exceptions:

A Cool Roof is **not** required if **any** of the following is true:

- Building has no HVAC ducts in the attic (ducts in conditioned space, crawlspace, below grade or is a ductless system)
- Roof areas have installations of integrated photovoltaic panels and building integrated solar thermal panels
- Roof construction has a weight of at least 25 lb/ft²
- If a steep-slope roof and either:
 - An air space of 1.0 inch is provided between top of roof deck and bottom of roofing product (typical with tile roofing)
 - Existing HVAC ducts in the attic are insulated and sealed according to Section 150.1(c)9^F
 - Building has a radiant barrier in the attic meeting the requirements of Section 150.1(c)2^G
 - Building has at least R-38 ceiling insulation
 - Roofing product profile ratio of rise to width is at least 1:5 for 50% or more of the width of the roofing product^H
 - R-2 or greater insulation present above the roof deck

3. Are the necessary Prescriptive forms included with the permit application?

YES NO

If the project...	Include this form:
Replaces existing roof material	CF1R-ALT-05-E: Certificate of Compliance for Prescriptive Residential Alterations (Non-HERS)
Uses the SRI method ^C	CF1R-ENV-04-E: Solar Reflectance Index (SRI) Calculation Worksheet

A – H See page 3 for notes.

Required Documentation & Building Inspection

Are Certificates of Compliance (CF1R forms) really required for reroofing?

- Some enforcement agencies may, at their discretion, choose **not** to require compliance documents for Prescriptive Residential Alteration projects that do NOT require Home Energy Rating System (HERS) verification. Even so, exemptions from submitting compliance documentation shall not be deemed to grant authorization for any work to be done in any manner in violation of this code or other provisions of law. See §10-103(a)1C for more information.

Does reroofing require HERS verification? Must its CF1R be registered with a HERS Provider?

- No, if the project is submitting via the Prescriptive Approach for a low-rise single-family home (using the CF1R-ALT-05-E), it will **not** trigger HERS measures.
- If it is submitting via the Prescriptive Approach for an Addition (CF1R-ADD) or the Performance Approach (CF1R-PRF) **and** any HERS measures are required for the scope of work, **all** forms must then be registered with a HERS provider.

What forms will the building inspector require?

- In addition to the CF1R-ALT-05-E submitted with the permit application, the inspector will look for the CF2R-ALT-05-E: Certificate of Installation for Residential Alterations (Non-HERS), which is completed by the installing contractor.
Also, for most projects, the inspector will check the Cool Roof product labeling and the CF2R to confirm they meet the required values specified on the CF1R.
- If the project replaces roof sheathing, radiant barrier requirements may occur. If the installing contractor is utilizing any exceptions to **not** install a radiant barrier, these must be documented by the contractor in the CF2R-ENV-04-E: Certificate of Installation for Roofing, for the inspector's review.

Any tips to pass along to permit applicants as they approach final building inspection?

- CRRC roofing product labels must be visible to the building inspector during inspection and must indicate values equal to or better than stated in the CF1R-ALT-05-E. These labels could be left on site in a readily accessible location or attached to the CF2R-ALT-05-E form.

Prescriptive or Performance

What do you mean by "Performance Approach" to compliance?

- The Performance Approach uses approved modeling software to "trade off" energy efficiency measures (so you can do "worse" than Prescriptive requirements for some things and "better" than Prescriptive for others, as long as the Mandatory requirements are met and the energy budget balances). This proof of energy budget balance is documented via the CF1R-PRF-01-E report. This may be considered if the project is unable to meet the Prescriptive requirements for reroofing supported by this checklist.

Solar PV (Photovoltaic)

Does a reroofing Alteration project trigger Solar PV (Photovoltaic) Energy Code?

- No, Solar Photovoltaic standards are not triggered by Alterations. They only apply to construction of new homes under particular circumstances.

If you reroof an existing steep-slope roof and install new solar panels at the same time, do Prescriptive requirements for solar reflectance and thermal emittance (or SRI) still apply?

- If the PV system is not integrated (such as on a rack), then Prescriptive Cool Roof requirements for solar reflectance and thermal emittance – or, alternatively, SRI – must still be met.
- If the project installs integrated PV panels (the roofing itself is photovoltaic), then Cool Roof requirements do not apply to the PV integrated panels, but may apply to all other areas of the new roof.

Notes

- A** “Solar reflectance” refers to a material’s ability to reflect the sun’s energy back into the atmosphere. The aged solar reflectance is the solar reflectance after three years, which typically is lower than the initial reflectance value. The higher the solar reflectance value, the better.
- B** “Thermal Emittance” refers to how much of absorbed heat is rejected by the material. The higher the thermal emittance value, the better.
- C** “SRI” refers to the Solar Reflectance Index. The SRI provides an alternative to meeting solar reflectance and thermal emittance requirements for Cool Roofs. It is calculated using the CF1R-ENV-04-E form based on the CRRC aged solar reflectance, thermal emittance and the slope of the roof, as well as the effect that these factors have on each other. The higher the SRI value, the better.
- If the roofing product has a thermal emittance that exceeds the Energy Code but a solar reflectance that does not meet the Energy Code — or vice versa — the project might comply using SRI.
- D** A steep-sloped roof has a rise-to-run ratio greater than 2:12 (more than 9.5 degrees from horizontal).
A low-sloped roof has a rise-to-run ratio of 2:12 or less (9.5 degrees or fewer from horizontal).
- E** To qualify as a Cool Roof under the Energy Code, the roofing material must have a Cool Roof Rating Council (CRRC) rating for aged solar reflectance and thermal emittance.
- Being included in the ENERGY STAR® list is NOT sufficient to meet the Energy Code.
- To find out more about Cool Roof rated products, see the CRRC-Rated Products Directory: <https://coolroofs.org/products/results>
- F** Per section 150.1(c)9 of the Energy Code, a Cool Roof exception applies when a steep-slope roof meets either of the following conditions:
- The ducts are located in a vented attic meeting the Prescriptive requirements of Table 150.1-A/B (R-19 insulation below roof deck and R-38 at ceiling) and the ducts are insulated per Table 150.1-A/B (R-8).
 - The HVAC ducts and air handler are located entirely within the conditioned space, leakage ≤ 25 CFM to outside as verified by a HERS Rater, and the ducts are insulated per Table 150.1-A/B (R-6).
- G** A radiant barrier shall have an emittance of 0.05 or less, tested in accordance with ASTM C1371 or ASTM E408, and shall be certified to the Department of Consumer Affairs as required by Title 24, Part 12, Chapter 12-13, Standards for Insulating Material, and meeting the installation criteria of RA4.2.1 including minimum 1” vented airspace below the shiny side of the radiant barrier.
- H** A Cool Roof is not required if the project involves a steep-slope roof and its roofing product profile ratio of rise to width is at least 1:5 for 50% or more of the width of the roofing product. An example of a tile that would qualify in this exception is shown here, as its height is greater than 1/5 its width. This type of product effectively creates an air gap between the roofing product and the underlying roof assembly, eliminating the requirement for a Cool Roof.



For More Information

The Energy Code (Title 24, Part 6 Energy Standards)

- Energy Code Section **150.2(b)11** – Energy Efficiency Standards for Alterations to Existing Low-rise Residential Buildings – Prescriptive Approach, **Roofs**
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1502energyefficiencystandardsforadditionsandalterationsto.htm
- Energy Code Section **150.1(c)11** – Prescriptive Compliance Approaches for Low-Rise Residential Buildings - **Roofing Products**
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1501performanceandprescriptivecomplianceapproachesforlowr.htm#cprescriptivestandardscomponentpackage.htm
- Energy Code Section **110.8(i)** – **Mandatory Requirements** for Roofing Products – Solar Reflectance and Thermal Emittance
energycodeace.com/site/custom/public/reference-ace-2019/index.html#!Documents/section1108mandatoryrequirementsforinsulationroofingproductsandr1.htm
- Energy Code Table **150.1-A** – **Component Package**: Single Family Standard Building Design
energycodeace.com/site/custom/public/reference-ace-2019/Documents/section1501performanceandprescriptivecomplianceapproachesforlowr.htm#table1501acomponentpackagesinglefamilystandardbuildingdesign.htm

To Interpret the Energy Code

- Energy Code Ace **Fact Sheet**: **Residential Cool Roofs and Reroofing**
energycodeace.com/download/35119/file_path/fieldList/FactSheet.Res-CoolRoofs.2019
- Energy Code Ace **Application Guide**: **Residential Envelope, Solar Ready and Solar PV** (see Chapter 5)
energycodeace.com/download/40887/file_path/fieldList/AppGuide.Res.%20Envelope_SolarReady_PV.2019
- Energy Code Ace **Quick Reference Sheet**: Compliance Baseline Low-Rise Residential, **Climate Zones 7, 10, 14, & 15** (see Climate Zone 10)
energycodeace.com/download/35123/file_path/fieldList/Quick%20Ref.ComplianceBaseline.LR-Res%20zn%207.10.14.15%202019
- Energy Code **Residential Compliance Manual** (see Chapter 9, section 9.4.4.1 and Chapter 3, section 3.4.3)
energycodeace.com/site/custom/public/reference-ace-2019/Documents/94prescriptiveandmandatorymeasures.htm
energycodeace.com/site/custom/public/reference-ace-2019/Documents/34opaqueenvelope.htm

Forms for Reroofing Projects (Prescriptive Approach)

- **CF1R-ALT-05-E: Certificate of Compliance** for Residential Alterations (Non-HERS)
energycodeace.com/download/39471/file_path/fieldList/2019-CF1R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf
- **CF1R-ENV-04-E: Solar Reflectance Index Calculation** Worksheet (Non-HERS)
energycodeace.com/download/39474/file_path/fieldList/2019-CF1R-ENV-04-E-CoolRoofAndSRIWorksheet.pdf
(submit only when using the SRI method for compliance)
- **CF2R-ENV-04-E: Certificate of Installation** for Roofing-Radiant Barrier
energycodeace.com/download/39481/file_path/fieldList/2019-CF2R-ENV-04-Roofing-RadiantBarrier.pdf
- **CF2R-ALT-05-E: Certificate of Installation** for Residential Alterations (Non-HERS)
energycodeace.com/download/39478/file_path/fieldList/2019-CF2R-ALT-05-E-PrescriptiveAlterations-SimpleNonHERS-PaperVersion.pdf



This program is funded by California utility customers and administered by Pacific Gas and Electric Company (PG&E), San Diego Gas & Electric Company (SDG&E®), Southern California Edison Company (SCE), and Southern California Gas Company (SoCalGas®) under the auspices of the California Public Utilities Commission.

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