



Use this checklist when the project

- Alters and/or adds fenestration (windows, skylights and/or glazing in doors) to the existing home — 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 (Energy Code or Title 24, Part 6)?

 YES NO

The project triggers the Energy Code if it changes or adds new fenestration (windows, skylights or glazing in opaque doors) to the existing house. This includes replacing a single window, even if fenestration area does not increase.

Exceptions:

- Replacing ONLY window glazing, sash or both (framing remains). If you don't change the frame it doesn't trigger code.
- Replacing fenestration associated with unconditioned spaces. (For example, replacing a window between an unconditioned garage and the outside would not trigger the code; neither would replacing a window that is in a wall that separates two areas in an unconditioned garage.)

2. Does it meet the Energy Code's requirements under the Prescriptive Approach?

Prescriptive requirements for fenestration Alterations in Climate Zone 1 depend on the type of project:

 YES NO

Replacing Fenestration (No Increase in Area) ^D	U-Factor ^B	SHGC ^{B, C}
• Windows and Door Glazing – 75 ft ² or less	0.40 or lower	0.35 or lower
• Windows and Door Glazing – More than 75 ft ²	0.30 or lower	0.23 or lower
• Skylights – any amount	0.55 or lower	0.30 or lower

Increasing Fenestration Area ^E	U-Factor ^B	SHGC ^{B, C}	Total Fenestration ^E Area (% of CFA ^A)	West-facing ^F Area (% of CFA ^A)
• Windows and Door Glazing – 75 ft ² or less	0.30 or lower	0.23 or lower	n/a	n/a
• Windows and Door Glazing – More than 75 ft ²	0.30 or lower	0.23 or lower	20% or less ^G	5% or less ^G
• Skylights – 16 ft ² or less	0.55 or lower	0.30 or lower	n/a	n/a
• Skylights – More than 16 ft ²	0.30 or lower	0.23 or lower	20% or less ^G	5% or less ^G

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

 YES NO

If the project...	Include this form:
Adds or replaces fenestration only (in existing house)	CF1R-ALT-05-E ^H : Certificate of Compliance for Prescriptive Residential Alterations (Non-HERS)
Also uses averaged U-factor and SHGC values ^I	CF1R-ENV-02-E: Area Weighted Average Calculation Worksheet

A – I See page 3 for notes.

Required Documentation and Building Inspection

Are Certificates of Compliance (CF1R forms) really required for window and skylight Alterations?

- Some enforcement agencies may, at their discretion, choose **not** to require compliance documents for Prescriptive Residential Alteration projects that do NOT require 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 a basic window or skylight replacement require HERS verification? Must its CF1R form 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.
- Prescriptive glazing changes can be done on the [CF1R-ALT-01-E](#) either because other parts of the project have HERS measures OR the document author simply chooses to use the [CF1R-ALT-01-E](#). 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 Alterations That Do Not Require HERS Field Verification, which is completed by the person who is responsible for installing the altered windows and skylights.

Also, for most projects, the inspector will check the NFRC labels on the fenestration and the CF2R to confirm they meet the required values specified on the CF1R. (See the next question below.)

Any tips for permit applicants as they approach final building inspection?

- Per Mandatory Measures, U-factor and SHGC values for **manufactured** windows and skylights must be listed on the CF1R using one of two approved sources:
 - Values listed directly on product label (only values from NFRC – National Fenestration Rating Council)
 - Default values listed in Energy Code Table 110.6-A (U-factor) and Table 110.6-B (SHGC)
- Field-fabricated window products have different certification requirements in which they must use the default values. See §110.6(b) for more information.

If values from NFRC product labels are used on the CF1R for compliance, corresponding windows on-site MUST still have their labels on and visible to the building inspector during inspection. Do not remove labels from these products, as the building inspector will need to verify U-factor and SHGC values specific to each altered window.

Single Window Replacement Projects

What if the Alteration project only involves replacing one existing window? Does this trigger Title 24?

- Yes. Even just one window replacement triggers an Alteration under Title 24, Part 6. However, if only the glazing or sash (or both) were replaced, it would be considered a Repair, and NOT trigger Title 24. (Changing the frame triggers the code.)

What if the Alteration project also includes the replacement of a solid exterior door?

- See Simple Remodels checklist.

Prescriptive or Performance Approach

What do you mean by “Performance Approach” to compliance?

- The Performance Approach provides another pathway to compliance that uses approved modeling software to “tradeoff” energy efficiency measures (so you can do “worse” than Prescriptive requirements for some things and “better” than Prescriptive for others, as long as all Mandatory requirements are met and the energy budget balances). Proof of energy budget balance is documented via the [CF1R-PRF-01-E](#). The Performance Approach may be considered if the project is unable to meet the Prescriptive requirements for window or skylight Alterations supported by this checklist.



Notes

A "CFA" is conditioned floor area, which is determined by using the floor area (in square feet) of enclosed conditioned space on all floors of a building, as measured at the floor level of the exterior surfaces of exterior walls enclosing the conditioned space.

B U-factor measures a window assembly's rate of heat loss (how well it insulates). Solar Heat Gain Coefficient (SHGC) measures the ability to limit sunlight from warming the interior space. U-factor and SHGC values are "area-weighted average" values. Weighted averaging is a mathematical technique for combining different amounts of various window products into a single number.

Note that alterations involving up to 3 ft² of new glazing area installed in doors and up to 3 ft² of new tubular skylights area with dual-pane diffusers are not required to meet the Prescriptive U-factor and SHGC requirements for those fenestration areas. However, they must meet the Mandatory requirement of maximum U-factor of 0.45 except for up to 10 ft² or 0.5% of the CFA (whichever is greater) of new fenestration and skylights.

If the project uses fenestration with chromogenic glazing, which responds to automatic controls based on solar intensity, an exception applies. See Exception 3 to §150.1(c)3A for details.

C SHGC may be calculated by taking qualifying exterior shading into consideration.

D "Replacement fenestration" may include fenestration that is located in the same existing wall or roof in which the same or larger area of existing fenestration is being removed. This is labeled as "altered." Any new fenestration area that increases the total net area of fenestration in any existing wall or roof is labeled as "new." Walls or roofs that are closed up due to removed windows or skylights will need to be insulated to Mandatory minimums of §150.0(a)(b)(c).

E Total Fenestration Area considers all the fenestration in the building. That is, the new fenestration plus existing fenestration that remains after the project. Fenestration includes windows, skylights and glazing in doors. (Opaque doors with 25% or greater glazing are treated as fenestration where the total rough opening is counted as the glazing area.)

F West-facing for all glazing is $\leq 45^\circ$ north of true west to $< 45^\circ$ south of true west. West-facing includes skylights with a pitch $< 1:12$ facing any direction, and west-facing skylights with a pitch $> 1:12$.

G The following Prescriptive requirement applies when added fenestration area exceeds 75 ft² (or added skylight area exceeds 16 ft²):

- The entire building's **total** fenestration area – including added fenestration – must be less than or equal to 20% of the building's CFA.
- The entire building's total west-facing fenestration – including added west-facing fenestration – must be less than or equal to 5% of the building's conditioned floor area.
- If the fenestration area is greater than 20% of the CFA, the project cannot comply prescriptively, and must use the Performance Approach to demonstrate compliance. (See "Prescriptive or Performance Approach" in the FAQs section of this checklist.)

H The **CF1R-ALT-01-E**: Certificate of Compliance for Prescriptive Residential Alterations (HERS) may be used to show compliance of fenestration even if the project does not trigger any HERS measures.

I The **CF1R-ENV-02-E** is only necessary when the project involves differing window specifications (more than one level of window U-factor or SHGC used in a building to meet Prescriptive compliance requirements). This worksheet helps to calculate area-weighted average U-factors for fenestration or Solar Heat Gain Coefficient (SHGC) values for Prescriptive compliance.

Note that dynamic glazing is treated independently and cannot be combined with other fenestration types on the form. Submit the **CF1R-ENV-02-E** with the energy compliance documents.



For More Information

CALIFORNIA ENERGY COMMISSION

www.energy.ca.gov

Learn more about the California Energy Commission (CEC) and its programs on its website.

2022 Building Energy Efficiency Standards

bit.ly/CEC2022Standards

Explore the main CEC web portal for the 2022 Energy Code, including information, documents and historical information.

2022 Building Energy Efficiency Standards Summary

bit.ly/CEC2022Summary

View or download this visual summary of the Energy Code's purpose, current changes and impact.

2022 Reference Appendices

bit.ly/ECA-2022-reference-appendices

View the Joint, Residential and Nonresidential Appendices here.

2022 Energy Code Single-family Residential Compliance Manual, Chapter 4 – HVAC Requirements

bit.ly/CEC-2022-SF-residential-compliance-manual

Modernized Appliance Efficiency Database System (MAEDbS)

bit.ly/MAEDbS

Search this database to find products that comply with the Energy Code.

Energy Code Hotline

Call: 1-800-772-3300 (Free)

Email: Title24@energy.ca.gov

Online Resource Center

bit.ly/CEC-ORC

Use these online resources developed for building and enforcement communities to learn more about the Energy Code.



EnergyCodeAce.com

Stop by this online "one-stop-shop" for no-cost tools, training and resources designed to help you comply with California's Title 24, Part 6 and Title 20.



Tools

energycodeace.com/tools

Explore this suite of interactive tools to understand the compliance process, required forms, installation techniques and energy efficiency regulations in California.

Reference Ace

energycodeace.com/content/tools-ace-reference-ace

Navigate the Title 24, Part 6 Energy Code using an index, keyword search and hyperlinked text.

Forms Ace

energycodeace.com/content/tools-ace-forms-ace

Find the forms that apply to your specific project.

Energy Code Product Finder

energycodeace.com/content/product-finder

Find Title 24, Part 6-compliant products.

Q&Ace

energycodeace.com/QAndAce

Search our online knowledge base or submit your question to Energy Code Ace™ experts.



Training

energycodeace.com/training

On-demand, live in-person and online training alternatives are tailored to a variety of industry professionals and address key measures.



Resources

energycodeace.com/resources

Downloadable materials provide practical and concise guidance on how and when to comply with California's building and appliance energy efficiency standards.

Create an account on the Energy Code Ace site and select an industry role for your profile in order to receive messages about all our offerings!



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