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Prescriptive Residential Alterations That Do Not Require HERS Field Verification

CERTIFICATE OF COMPLIANCE	CF1R-ALT-05-E
Prescriptive Residential Alterations That Do Not Require HERS Field Verification	(Page 1 of 8)

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This compliance document is only applicable to simple alterations that do not require HERS verification for compliance. When HERS verification is required, a CF1R-ALT-01 shall first be registered with a HERS Provider Data Registry.

Alterations to Space Conditioning Systems that are exempt from HERS verification requirements may use the CF1R-ALT-05 and CF2R- ALT-05 Compliance Documents. Possible exemptions from duct leakage testing include: less than 40 ft of ducts were added or replaced; or the existing duct system was insulated with asbestos; or the existing duct system was previously tested and passed by a HERS Rater. If space conditioning systems are altered and are not exempt from HERS verification, then a CF1R-ALT-02 must be completed and registered with a HERS Provider Data Registry.

Alterations that utilize close Cell Spray Polyurethane Foam (ccSPF) with a density of 1.5 to less than 2.5 pounds per cubic foot having an R-value greater than 5.8 per inch, or Open Cell Spray Polyurethane Foam (ocSPF) with a density of 0.4 to less than 1.5 pounds per cubic foot having an R-value of 3.6 per inch, shall complete and register a CF1R-ALT-01 with a HERS Provider Data Registry.

If more than one person has responsibility for installation of the items on this certificate, each person shall prepare and sign a certificate applicable to the portion of construction for which they are responsible. Alternatively, the person with chief responsibility for construction shall prepare and sign this certificate for the entire construction. All applicable Mandatory Measures shall be met. Temporary labels shall not be removed before verification by the building inspector.

A. General Information

01	Project Name:		02	Date Prepared:	
03	Project Location:		04	Building Front Orientation (deg or cardinal):	
05	CA City:		06	Number of Altered Dwelling Units:	
07	Zip Code:		08	Fuel Type:	
09	Climate Zone:		10	Total Conditioned Floor Area (ft^2):	
11	Building Type:		12	Slab Area (ft^2):	
13	Project Scope:				

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Prescriptive Residential Alterations That Do Not Require HERS Field Verification (Page 2 of 8)

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B. Building Insulation Details (Section 150.2(b)1)

01	02	03	04	05	06		07	08	09	10	11
					Proposed					**Required**	
Tag/ID	Assembly Type	Frame Type	Frame Depth (inches)	Frame Spacing (inches)	Cavity R-value	Continuous Insulation R-value	U-factor	Appendix JA4 Reference Table	Appendix JA4 Reference Cell	U-Factor from Table 150.1-A or B	Comments

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C. Roof Replacement (Prescriptive Alteration, Section 150.2(b)1H)

01	02	03	04	05	06	07	08	09	10	11	12	13
						Proposed				**Minimum Required**		
Method of Compliance	Roof Pitch	Exception	CRRC Product ID Number	Product Type	R-value Deck Insulation	Initial Solar Reflectance	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)

NOTES:

- Roof area covered by building integrated photovoltaic panels and solar thermal panels are exempt from the above Cool Roof requirements.
- Liquid field applied coatings must comply with installation criteria from Section 110.8(i)4.

D. Fenestration/Glazing Allowed Areas and Efficiencies (Section 150.2(b)1)

01	02	03	04		05		06		07
Alteration Type	Maximum Allowed Fenestration Area For All Orientations (ft^2)	Maximum Allowed West-Facing Fenestration Area Only (ft^2)	Existing Fenestration Area for All Orientations (ft^2)	Existing West-Facing Fenestration Area (ft^2)	Maximum Allowed U-factor (Windows)	Maximum Allowed U-factor (Skylights)	Maximum Allowed SHGC (Windows)	Maximum Allowed SHGC (Skylights)	Comments

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E. Fenestration Proposed Areas and Efficiencies – Add (Section 150.2(b)1A)

Note: Doors with greater than or equal to 25 percent glazed area are considered glazed doors and are treated as fenestration products.

01	02	03	04	05	06	07	08	09	10	11	12	13	14
Tag/ID	Fenestration Type	Frame Type	Dynamic Glazing	Orientation N, S, W, E	Number of Panes	Proposed Fenestration Area ft^2	Proposed West Facing Fenestration Area ft^2	Proposed U-factor	Proposed U-factor Source	Proposed SHGC	Proposed SHGC Source	Exterior Shading Device	Combined SHGC from CF1R-ENV-03

15	Total Proposed Fenestration Area		
16	Maximum Allowed Fenestration Area		
17	Compliance Statement	Existing + Proposed Fenestration Area ≤ Maximum Allowed Fenestration Area	☐ Yes ☐ No
18	Total Proposed West-Facing Fenestration Area		
19	Maximum Allowed West-Facing Fenestration Area		
20	Compliance Statement	Existing + Proposed West-Facing Fenestration Area ≤ Maximum Allowed West-Facing Fenestration Area	☐ Yes ☐ No
21	Proposed Fenestration U-factor (Windows)		
22	Required Fenestration U-factor (Windows)		
23	Compliance Statement	Proposed Fenestration U-factor ≤ Required Fenestration U-factor	☐ Yes ☐ No
24	Proposed Fenestration SHGC (Windows)		
25	Required Fenestration SHGC (Windows)		
26	Compliance Statement	Proposed Fenestration SHGC ≤ Required Fenestration SHGC	☐ Yes ☐ No
27	Proposed Fenestration U-factor (Skylights)		
28	Required Fenestration U-factor (Skylights)		
29	Compliance Statement	Proposed Fenestration U-factor ≤ Required Fenestration U-factor	☐ Yes ☐ No
30	Proposed Fenestration SHGC (Skylights)		
31	Required Fenestration SHGC (Skylights)		

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32	Compliance Statement	Proposed Fenestration SHGC ≤ Required Fenestration SHGC	☐ Yes ☐ No

F. Fenestration/Glazing Proposed Areas and Efficiencies – Replace (Section 150.2(b)1B)

Note: Doors with greater than or equal to 25 percent glazed area are considered glazed doors and are treated as fenestration products.

01	02	03	04	05	06	07	08	9	10	11	12	13	14
Tag/ ID	Fenestration Type	Frame Type	Dynamic Glazing	Orientation N, S, W, E	Area Removed (ft^2)	Area Added (ft^2)	Net Added Area (ft^2)	Proposed U-factor	Proposed U-factor Source	Proposed SHGC	Proposed SHGC Source	Exterior Shading Device	Combined SHGC from CF1R-ENV-03

15	Net Added West-facing Fenestration Area	
16	Is Net Added Fenestration Area ≤ for west-facing fenestration?	☐ Yes ☐ No
17	Net Added Fenestration Area (all orientations)	
18	Is Net Added Fenestration Area ≤ 0 for all orientations?	☐ Yes ☐ No
19	Proposed Fenestration U-factor (Windows)	
20	Required Fenestration U-factor (Windows)	
21	Is the proposed Fenestration U-factor ≤ the Required Fenestration U-factor?	☐ Yes ☐ No
22	Proposed Fenestration SHGC (Windows)	
23	Required Fenestration SHGC (Windows)	
24	Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC?	☐ Yes ☐ No
25	Proposed Fenestration U-factor (Skylights)	
26	Required Fenestration U-factor (Skylights)	
27	Is the proposed Fenestration U-factor ≤ the Required Fenestration U-factor?	☐ Yes ☐ No
28	Proposed Fenestration SHGC	
29	Required Fenestration SHGC	
30	Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC?	☐ Yes ☐ No

G. Space Conditioning (SC) Systems – Heating/Cooling (Prescriptive Section 150.2(b))

Alterations to Space Conditioning Systems shall be exempt from HERS verification requirements as prerequisite for use of the CF1R-ALT-05 and CF2R- ALT-05 Compliance Documents. If new space conditioning systems are installed or existing systems are altered and are not exempt from HERS verification, then a CF1R-ALT-02 shall be completed and registered with a HERS Provider Data Registry. In each row below for each dwelling unit in the building, check the box that indicates the exemption from HERS verification compliance:

☐ a: space conditioning system was not altered;
☐ b: less than 40 ft of ducts were added or replaced;
☐ c: (exempt from duct leakage testing) if: the existing duct system was insulated with asbestos;
☐ d: (exempt from duct leakage testing) if: the existing duct system was previously tested and passed by a HERS Rater.

01	02	03	04
Dwelling Unit Name	SC System Identification or Name	SC System Location or Area Served	Exemption from HERS Verification
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d
			☐ a ☐ b ☐ c ☐ d

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H. Water Heating Systems (Section 150.2(b)1G)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Dwelling Unit Name	Water Heating System Identification or Name	Water Heating System Location or Area Served	Water Heating System Type	Water Heater Type	# of Water Heaters in System	Water Heater Storage Volume (gal)	Fuel Type	Rated Input Type	Rated Input Value	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Back-Up Solar Savings Fraction

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DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

1. I certify that this Certificate of Compliance documentation is accurate and complete.

Documentation Author Name:	Documentation Author Signature:
Company:	Signature Date:
Address:	CEA/ HERS Certification Identification (if applicable):
City/State/Zip:	Phone:

RESPONSIBLE PERSON'S DECLARATION STATEMENT

I certify the following under penalty of perjury, under the laws of the State of California:

1. The information provided on this Certificate of Compliance is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer).
3. That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations.
4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.
5. I will ensure that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Designer Name:	Responsible Designer Signature:
Company :	Date Signed:
Address:	License:
City/State/Zip:	Phone:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300.

CF1R-ALT-05-E User Instructions

NOTE: If more space is needed, print a duplicate page and fill in.

Minimum requirements for prescriptive alteration compliance can be found in Building Energy Efficiency Standards Section 150.2(b)1.

Completing these forms will require that you have the Reference Appendices for the 2019 Building Energy Efficiency Standards (P400-2018-020). This document contains the Joint Appendices which are used to determine climate zone and to complete the section for opaque surfaces. When the term CF1R is used it means the CF1R-ALT-05. Worksheets are identified by their entire name and subsequently by only the worksheet number, such as ENV-02.

Instructions for sections with column numbers and row letters are given separately.

If any part of the alteration does not comply, prescriptive compliance fails, in which case the performance compliance approach must be used in an attempt to achieve compliance.

A. General Information

1. Project Name: Identifying information, such as owner's name.
2. Date Prepared: Date of document preparation.
3. Project Location: Legal street address of property or other applicable identifying information.
4. Building Front Orientation: Building front orientation expressed in degrees, where North = 0, East = 90, South = 180, and West = 270. Indicate cardinal if it is a subdivision or multi-family project built in multiple orientations. The standards (section 100.1) include the following additional details for determining orientation:
    - Cardinal covers all orientations (for buildings that will be built in multiple orientations);
    - North is oriented to within 45 degrees of true north, including 45 degrees east of north;
    - East is oriented to within 45 degrees of true east, including 45 degrees south of east;
    - South is oriented to within 45 degrees of true south, including 45 degrees west of south;
    - West is oriented to within 45 degrees of true west, including 45 degrees north of west.
5. CA City: Legal city/town of property.
6. Number of Altered Dwelling Units: 1 for single-family, 1 or more for multifamily.
7. Zip Code: 5-digit zip code for the project location (used to determine climate zone).
8. Fuel Type: Natural Gas, Liquefied Propane Gas, or Electricity.

    NOTE: Prescriptive compliance only allows electricity if natural gas is not connected to the building, or if the conditions of Section 150.2(b)1Hiiie are met. See instruction at section H for more information.

9. Climate Zone: From Joint Appendix JA2.1.1.
10. Total Conditioned Floor Area: Enter the new conditioned floor area in ft^2, as measured from the outside of exterior walls of the dwelling unit or building being altered.
11. Building Type: Single Family (includes duplex), or Multi-Family (a building that shares common walls and common floors or ceilings).
12. Slab Area: Area of the first floor slab (if any) in ft^2.
13. Project Scope: Insulation, Roof Replacement, Fenestration/Glazing, Heating System, Cooling System, Duct System, and/or Water Heating System alteration.

B. Building Insulation Details (Section 150.2(b)1)

1. Tag/ID: A label (if any) from the plans, such as A1.4 or wall.
2. Assembly Type: Roof, Ceiling, Wall, or Floor.
3. Frame Type: Wood or Metal.
4. Frame Depth: Nominal dimensions of framing material in inches such as 2x4, 2x6, 2x8, 2x10.
5. Frame Spacing: 16, 24, or 48 inches on center.

6. Proposed Cavity R-value: Insulation installed between framing.

   Proposed Continuous Insulation R-value: R-value of rigid or continuous insulation (not interrupted by framing). See Table 4.3.4. of Reference Appendices for metal frame construction.

   NOTE: Section 110.8(d) specifies that if adding insulation to an existing attic, the resulting attic insulation must total R-22. However, the amount of insulation required is limited to the amount of room available for insulation without conflicting with Building Code Section 1203.2.

7. Proposed U-factor: The U-factor for the entire assembly.
8. Appendix JA4 Reference Table: Table number used to determine the R-value or U-factor (e.g., an attic assembly is 4.2.1).
9. Appendix JA4 Reference Cell: Cell number used to determine the R-value or U-factor (e.g., an R-38ceiling with 24-inch on center framing is A21).
10. Required U-factor: From the requirements in Sections 110.8 and 150.0.
11. Comments: Any notes regarding location, unique conditions, or attachments.

C. Roof Replacement (Prescriptive Alteration, Section 150.2(b)1H)

When 50% or more of the roof is being replaced the roofing requirements are triggered. Any areas of roof covered by building integrated photovoltaic panels and solar thermal panels are exempt, but the area of roof not covered by photovoltaic panels would still need to meet any applicable cool roof requirements. Additionally, there are many alternatives/exceptions to when a cool roof is required.

When the roof is steep slope (pitch greater than or equal to 2:12) the roof requirements include a cool roof in climate zones 10-15. The minimum requirement is 0.20 Aged Solar Reflectance, 0.75 Thermal Emittance, or a minimum SRI of 16.

1. Method of Compliance: Indicate if the method of compliance is going to be based on Aged Solar Reflectance and Thermal Emittance, the Solar Reflectance Index (SRI), or an Exception.
2. Roof Pitch: Expressed as 4:12, for example, which means the roof rises 4 foot within a span of 12 feet. When roofs have multiple pitches the requirements are based on the pitch of 50% or more of the roof.
3. Exception: If meeting one of the exceptions. Indicate which exception is, or will be, met.

EXCEPTIONS AND ALTERNATIVES FOR STEEP SLOPE ROOFS**:**

(a) Mass roof 25 lbs/ft^2 or greater (uncommon situation such as sod roof);
(b) Air space 1" from top of roof deck to bottom of roofing;
(c) 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;
(d) Ducts already meet Section 150.1(c) insulation and duct leakage requirements;
(e) Roof has R-38 insulation;
(f) Roof has a radiant barrier;
(g) No ducts are installed in the attic; or
(h) R-2 insulation above the roof deck.

In climate zones 13 & 15, when there is a low slope roof (pitch less than 2:12) the cool roof requirements are for a minimum Aged Solar Reflectance of 0.63, a minimum 0.75 Thermal Emittance, or a minimum SRI of 75.

EXCEPTIONS AND ALTERNATIVES FOR LOW SLOPE ROOFS:

(a) Mass roof 25 lbs/ft^2 or greater (uncommon situation such as sod roof);
(b) No ducts are installed in the attic; or
(c) Roof deck insulation—by installing roof deck insulation, a lower aged solar reflectance is required: R-2 (0.62-0.60), R-4 (0.59-0.55), R-6 (0.54-0.50), R-8 (0.49-0.45), R-12 (0.44-0.40), R-16 (0.39-0.35), R-20 (0.34-0.30), R-24 (0.29-0.25).

NOTE: If one of the exceptions above has been selected then the rest of Section C. is Not Required.

4. CRRC Product ID Number: The CRRC Product ID Number is obtained from the Cool Roof Rating Council's Rated Product Directory at www.coolroofs.org/products/results . Products are listed by manufacturer, brand, type of installation, roofing material, and color, as well as product performance.
5. Product type: See Cool Roof Rating Council's directory. Generally product types include single-ply roof, wood shingles, asphalt roof, metal roof, tile roof.
6. R-value Deck Insulation: If one of the exceptions selected includes adding roof deck insulation, indicate the R-value of the insulation.
7. Proposed Initial Solar Reflectance: Based on the product chosen from the Cool Roof Rating Council's Rated Product Directory. If using default assumption indicate N/A since the Aged Solar Reflectance is available.
8. Proposed Aged Solar Reflectance: Value is from the Cool Roof Rating Council's Rated Product Directory. If the aged value is not available, calculate the Aged Solar Reflectance using the Solar Reflectance Index (SRI) Calculator located on the California Energy Commission website or the aging equation $\rho_{aged}=[0.2+\beta[\rho_{initial}-0.2]$, where $\rho_{initial}$ = the initial solar reflectance and soiling resistance β is listed by product type below.

VALUES OF SOILING RESISTANCE β BY PRODUCT TYPE

Product Type	CRRC Product Category	β
Field-Applied Coating	Field-Applied Coating	0.65
Other	Not A Field-Applied Coating	0.70

9. Proposed Thermal Emittance: From the product specification default value. If using a calculated SRI place the Thermal Emittance used to calculate SRI.
10. Proposed SRI: It is optional to meet the SRI but if chosen to do so, use the Solar Reflectance Index (SRI) Calculator found on the California Energy Commission website http://energy.ca.gov/title24/2019standards/.
11. Minimum Required Aged Solar Reflectance: Based on climate zone and roof slope.
12. Minimum Required Thermal Emittance: Based on climate zone and roof slope.
13. Minimum Required SRI: Based on climate zone and roof slope.

NOTE: If the cool roofing requirements will be met by a liquid field applied coating, Section 110.8(i)4 requires the coating be applied across the entire roof surface and meet the dry mil thickness or coverage recommended by the manufacturer.

D. Fenestration/Glazing Allowed Areas and Efficiencies

The Alteration and Fenestration Type will affect how the standards apply and whether the fenestration area is limited. Percentages are determined as Conditioned Floor Area x 0.20 = total ft^2 of fenestration allowed (20%). Depending on the climate zone, if west-facing fenestration is limited (in climate zones 2, 4, 6-15), it is limited to a maximum of 5%. The overall total fenestration area is limited to 20%, not 25%. Fenestration areas are expressed in square feet, not square inches.

1. Alteration Type: Indicate the type of fenestration alteration - adding fenestration/glazing, replacing fenestration/glazing, adding fenestration/glazing ≤ 75 ft^2 windows, replacing fenestration/glazing ≤ 75 ft^2 window, adding fenestration/glazing ≤ 16 ft^2 skylight and or replacing fenestration/glazing skylights
2. Maximum Allowed Fenestration Area for All Orientations (ft^2): The maximum allowed fenestration area is 20%. Depending on the type of fenestration and the alteration type, this field may have values such as 75 ft^2 or 16 ft^2.
3. Maximum Allowed West-Facing Fenestration Area Only: The Maximum Allowed West-Facing Fenestration Area is 5% of the conditioned floor area (used in climate zones 2, 4, and 6-15).

   NOTE: (1) If adding fenestration/glazing ≤ 16 ft^2 skylight, enter NA
   (2) West includes any vertical fenestration oriented to within 45 degrees of true west, including 45 degrees south of west. For skylights, west also includes any skylight area facing any direction with a pitch of less than 1:12

4. Existing Fenestration Area for All Orientations: Enter the area, in square feet, of the existing fenestration/glazing.
   Existing West-Facing Fenestration Area: Enter the area, in square feet, of the existing west-facing fenestration/glazing. If project has no existing west-facing fenestration then enter "0".
5. Maximum Allowed U-factor: Maximum U-factor from Table 150.1-A, Package A. This field will almost always be 0.30 unless the U-factor will be the area weighted average, CF1R-ENV-02-E, with other higher fenestration windows. For skylights this will be 0.55.

   NOTE: (1) If meeting Exception 2 to Section 150.2(b)1A (adding ≤ 16 ft^2 skylights), enter 0.55.
   (2) If meeting Exception 1 to Section 150.2(b)1B (replacing ≤ 75 ft^2 windows), enter 0.40.
   (3) If meeting Exception 2 to Section 150.2(b)1B (replacing skylights), enter 0.55.

6. Maximum Allowed SHGC: Maximum SHGC from Table 150.1-A or Table 150.1-B. This field will almost always be either 0.23 or N/A, depending on climate zone. N/A means there is no maximum SHGC required in this climate zone. The SHGC will be the area weighted average, CF1R-ENV-02-E, with other higher fenestration windows. For skylights this will be 0.30.

NOTE: (1) If meeting Exception 2 to Section 150.2(b)1A (adding ≤ 16 ft^2 skylights), enter 0.30.
(2) If meeting Exception 1 to Section 150.2(b)1B (replacing ≤ 75 ft^2 windows), enter 0.35.
(3) If meeting Exception 2 to Section 150.2(b)1B (replacing skylights), enter 0.30.

7. Comments: Note any special location or comment here.

E. Fenestration/Glazing Proposed Areas and Efficiencies - Add (Section 150.2(b)1A)

1. Tag/ID: A label (if any) from the plans, such as W1.
2. Fenestration Type: Indicate the type of fenestration construction e.g., Fixed Window, Operable Window, or Skylight.

   NOTE: Doors with glazing are counted in one of two ways. A door with 25% or more glazing is considered a glazed door and is counted as the entire door area. A door with less than 25% glazing can be counted as the entire door area or can be calculated as the actual glass area with a 2-inch (0.17 ft^2) frame all around.

3. Frame type: Metal, metal thermal break, or nonmetal.
4. Dynamic Glazing: Indicate if the fenestration has integrated shading device, chromogenic glazing or none for no dynamic glazing. Chromogenic glazing shall be considered separately from other fenestration types.
5. Orientation (North, East, South, West): The definitions in the Energy Efficiency Standards include these specific details -
   - North is oriented to within 45 degrees of true north, including 45 degrees east of north;
   - East is oriented to within 45 degrees of true east, including 45 degrees south of east;
   - South is oriented to within 45 degrees of true south, including 45 degrees west of south;
   - West is oriented to within 45 degrees of true west, including 45 degrees north of west.

   NOTE: Skylights in a roof pitch greater than 1:12 can be included as facing the same orientation as that portion of the roof angle. If the skylight is in a roof with a pitch less than 1:12, the skylight is assumed to face west.

6. Number of Panes: Indicate the number of panes for each Tag/ID; is it single, double, or triple pane window?
7. Proposed Fenestration Area (ft^2): Indicate the area (in square feet) of each exterior fenestration type, excluding west-facing fenestration.
8. Proposed West Facing Fenestration Area (ft^2): In climate zones 2, 4, 6-15, indicate the area (in square feet) of each exterior west-facing fenestration type separately.
9. Proposed U-factor: Enter (a) the NFRC U-factor based on the proposed brand and type of fenestration using National Fenestration Rating Council (www.nfrc.org) certified values, (b) the default value from Table 110.6-A or Equation NA6-1, or (c) the weighted average U-factor calculated on form CF1R-ENV-02-E.

   For the exceptions, up to 3 ft^2 of tubular skylights and up to 3 ft^2 of glazing in a door enter N/A, and for up to 16 ft^2 of skylight, enter 0.55. If any products (other than the exceptions) have a higher U-factor than 0.32, first complete a form CF1R-ENV-02 to calculate the area-weighted average U-factor and attach it to this CF1R.

   NOTE: Dynamic glazing is a glazing system that changes its performance U-factor and SHGC based on the physical environment. Dynamic glazing includes chromogenic glazing or integrated shading systems (this does not include internally or externally mounted shading devices). If using dynamic glazing, use the lowest tested U-factor and SHGC in Columns 9 and 11.

10. Proposed U-factor Source: NFRC, Table 110.6-A, Equations NA6-1, or Area-Weighted Average Worksheet (ENV-02). The source of the U-factor data for the fenestration product.
11. Proposed SHGC: In climate zones 2, 4, 6-15 enter the SHGC from (a) NFRC-rated certification information, or (b) default value from Table 110.6-B or Equation NA6-2, or (c) the weighted average SHGC calculated on form CF1R-ENV-02.

    For the exceptions – up to 3ft^2 of tubular skylights and up to 3ft^2 of glazing in a door, enter N/A; up to 16ft^2 of skylight, enter 0.30. If any products (other than the exceptions) have a higher SHGC than required by Table 150.1-A or Table 1501.-B, first complete a form CF1R-ENV-02 to calculate the area-weighted average SHGC and attach it to this CF1R.

12. Proposed SHGC Source: NFRC, Table 110.6-A, Equations NA6-1, or Area-Weighted Average Worksheet (ENV-02). The source of the U-factor data for the fenestration product.
13. Exterior Shading Device: If exterior shading devices are used to meet the SHGC requirement, indicate the type of device (from Table S-1 of CF1R-ENV-03 Solar Heat Gain Coefficient Worksheet) and attach an ENV-03.

    NOTES:
    (1) An exterior shading device is not used for products with an NFRC rated U-factor and SHGC; based on a factory integrated shading device.
    (2) If using an overhang for south-facing glazing, the glazing must be fully shaded at solar noon on August 21 and substantially exposed to direct sunlight at solar noon on December 21 (see Residential Manual, Section 3.3.6.3).

14. Combined SHGC from CF1R-ENV-03: If exterior shading devices are combined with the SHGC value of the fenestration to meet the prescriptive SHGC requirements (as indicated by a value in column E. 13), indicate the SHGC calculated on form CF1R-ENV-03 and attach the form for each window with an exterior shading device.

To determine compliance with allowable fenestrations areas and efficiencies, complete rows 15-32.

15. Total Proposed Fenestration Area: Enter the sum of the existing (D04a) and proposed fenestration areas for all orientations (E07 + E08). For project scopes: Add Fenestration/Glazing ≤ 75 ft^2 and/or Add Fenestration/Glazing ≤ 16 ft^2, enter NA.
16. Maximum Allowed Fenestration Area: Enter the maximum allowed fenestration area for all orientations, from D02.
17. Is the Total Proposed Fenestration Area ≤ the Maximum Allowed Fenestration Area: Indicate Yes if the Total Proposed Fenestration Area is less than or equal to the Maximum Allowed Fenestration Area. If No, the project fails prescriptive compliance – specified fenestration areas must be reduced, or compliance may be attempted using the performance approach.

    NOTE: If Total Proposed Fenestration Area equals NA, Design Complies - Indicate Yes.

18. Total Proposed West-Facing Fenestration Area: Enter the sum of the existing (D04b) and proposed west-facing fenestration areas (E08). For project scopes: Add Fenestration/Glazing ≤ 75 ft^2 and/or Add Fenestration/Glazing ≤ 16 ft^2, enter NA.
19. Maximum Allowed West-Facing Fenestration Area: Enter the maximum allowed west-facing fenestration area only, from D03.
20. Is the Total Proposed Fenestration Area ≤ the Maximum Allowed West-Facing Fenestration Area: Indicate Yes if the Total Proposed West-Facing Fenestration Area is less than or equal to the Maximum Allowed West-Facing Fenestration Area. If No, the project fails prescriptive compliance – specified west-facing fenestration areas must be reduced, or compliance may be attempted using the performance approach.

    NOTE: If Total Proposed West-Facing Fenestration Area equals NA, Design Complies - Indicate Yes.

21. Proposed Fenestration U-factor (Windows): If necessary, report the area-weighted average U-factor from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from column E09.
22. Required Fenestration U-factor (Windows): Enter the Maximum Allowed U-factor (D05a).
23. Is the Proposed Fenestration U-factor ≤ the Required Fenestration U-factor: Indicate Yes if the Proposed Fenestration U-factor is less than or equal to the Required Fenestration U-factor. If No, the project fails prescriptive compliance – specified fenestration U-factor must be reduced, or compliance may be attempted using the performance approach.
24. Proposed Fenestration SHGC (Windows): If necessary, report the area-weighted average SHGC from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from column E11 or E14.
25. Required Fenestration SHGC (Windows): Enter the Maximum Allowed SHGC (D06a).
26. Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC: Indicate Yes if the Proposed Fenestration SHGC is less than or equal to the Required Fenestration SHGC. If No, the project fails prescriptive compliance – specified fenestration SHGC must be reduced, or compliance may be attempted using the performance approach.
27. Proposed Fenestration U-factor (Skylights): If necessary, report the area-weighted average U-factor from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from column E09.
28. Required Fenestration U-factor (Skylights): Enter the Maximum Allowed U-factor (D05b).

29. Is the Proposed Fenestration U-factor ≤ the Required Fenestration U-factor: Indicate Yes if the Proposed Fenestration U-factor is less than or equal to the Required Fenestration U-factor. If No, the project fails prescriptive compliance – specified fenestration U-factor must be reduced, or compliance may be attempted using the performance approach.
30. Proposed Fenestration SHGC (Skylights): If necessary, report the area-weighted average SHGC from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from column E11 or E14.
31. Required Fenestration SHGC (Skylights): Enter the Maximum Allowed SHGC (D06b).
32. Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC: Indicate Yes if the Proposed Fenestration SHGC is less than or equal to the Required Fenestration SHGC. If No, the project fails prescriptive compliance – specified fenestration SHGC must be reduced, or compliance may be attempted using the performance approach.

F. Fenestration/Glazing Proposed Areas and Efficiencies – Replace (Section 150.2(b)1B)

1. Tag/ID: A label (if any) from the plans, such as W1.
2. Fenestration Type: Indicate the type of fenestration construction e.g., Fixed Window, Operable Window, or Skylight.

   NOTE: Doors with glazing are counted in one of two ways. A door with 25% or more glazing is considered a glazed door and is counted as the entire door area. A door with less than 25% glazing can be counted as the entire door area or can be calculated as the actual glass area with a 2-inch (0.17 ft^2) frame all around.

3. Frame Type: Metal, metal thermal break, or nonmetal.
4. Dynamic Glazing: Indicate if the fenestration has integrated shading device, chromogenic glazing or none for no dynamic Glazing.

   NOTE: Chromogenic glazing shall be considered separately from other fenestration types.

5. Orientation (North, East, South, West): The definitions in the Energy Efficiency Standards include these specific details -
   - North is oriented to within 45 degrees of true north, including 45 degrees east of north;
   - East is oriented to within 45 degrees of true east, including 45 degrees south of east;
   - South is oriented to within 45 degrees of true south, including 45 degrees west of south;
   - West is oriented to within 45 degrees of true west, including 45 degrees north of west.

   NOTE: Skylights in a roof pitch greater than 1:12 can be included as facing the same orientation as that portion of the roof angle. If the skylight is in a roof with a pitch less than 1:12, the skylight is assumed to face west.

6. Area Removed (ft^2): Enter the area, in square feet, of the fenestration/glazing being removed.
7. Area Added (ft^2): Enter the area, in square feet, of the fenestration/glazing being added.
8. Net Added Area (ft^2): The difference between the Area Added and the Area Removed.
9. Proposed U-factor: Enter (a) the NFRC U-factor based on the proposed brand and type of fenestration using National Fenestration Rating Council (www.nfrc.org) certified values, (b) the default value from Table 110.6-A, (c) Equation NA6-1, or (d) the area-weighted average U-factor calculated on form CF1R-ENV-02-E, Area-Weighted Average Calculation Worksheet.

   For the exceptions, up to 3 ft^2 of tubular skylights and up to 3 ft^2 of glazing in a door enter N/A, and for up to 16 ft^2 of skylight, enter 0.55. If any products (other than the exceptions) have a higher U-factor than 0.30, first complete an ENV-02 to calculate a weighted average U-factor and attach it to this CF1R.

   NOTE: Dynamic glazing is a glazing system that changes its performance U-factor and SHGC based on the physical environment. Dynamic glazing includes chromogenic glazing or integrated shading systems (this does not include internally or externally mounted shading devices). If using dynamic glazing, use the lowest tested U-factor and SHGC in Columns 9 and 11.

10. Proposed U-factor Source: NFRC, Table 110.6-A, Equations NA6-1, or Area-Weighted Average Worksheet (ENV-02). The source of the U-factor data for the fenestration product.
11. Proposed SHGC: In climate zones 2, 4, 6-15 enter the SHGC from (a) NFRC-rated certification information, (b) default value from Table 110.6-B, (c) Equation NA6-2, or (d) the weighted average SHGC calculated on form CF1R-ENV-02.

For the exceptions – up to 3ft^2 of tubular skylights and up to 3ft^2 of glazing in a door, enter N/A; up to 16ft^2 of skylight, enter 0.30. If any products (other than the exceptions) have a higher SHGC than required by Table 150.1-A or Table 150.1-B, first complete a form CF1R-ENV-02 to calculate the area-weighted average SHGC and attach it to this CF1R.

12. Proposed SHGC Source: NFRC, Table 110.6-B, Equations NA6-2, or Area-Weighted Average Worksheet (ENV-02). The source of the SHGC data for the fenestration product.
13. Exterior Shading Device: If exterior shading devices are used to meet the SHGC requirement, indicate the type of device (from Table S-1 of CF1R-ENV-03 Solar Heat Gain Coefficient Worksheet) and attach an ENV-03.

    NOTES: (1)An exterior shading device is not used for products with an NFRC rated U-factor and SHGC; based on a factory integrated shading device.
    (2)If using an overhang for south-facing glazing, the glazing must be fully shaded at solar noon on August 21 and substantially exposed to direct sunlight at solar noon on December 21 (see Residential Manual, Section 3.5.5).

14. Combined SHGC from CF1R-ENV-03: If exterior shading devices are combined with the SHGC value of the fenestration to meet the prescriptive SHGC requirements (as indicated by a value in column F. 13), indicate the SHGC calculated on form CF-1R-ENV-03 and attach the form for each window with an exterior shading device.

To determine compliance with allowable fenestration areas, complete rows 15-30.

15. Net Added West-facing Fenestration Area: If limited, enter the total amount of west-facing fenestration ONLY that will be added to the dwelling unit when alterations are complete.
16. Is Net Added Fenestration Area ≤ 0 for west-facing fenestration? Indicate Yes or No. If No, the project fails prescriptive compliance – specified west-facing fenestration areas must be reduced, or compliance may be attempted using the performance approach.
17. Net Added Fenestration Area (all orientations): This field is to show the net area of added fenestration for all orientations.
18. Is Net Added Fenestration Area ≤ 0 for all orientations? Indicate Yes or No. If No, the project fails prescriptive compliance – specified fenestration areas must be reduced, or compliance may be attempted using the performance approach.
19. Proposed Fenestration U-factor (Windows): If necessary, enter the area-weighted average U-factor from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from F09.
20. Required Fenestration U-factor (Windows): From Section D., report the value of column 05a.
21. Is the Proposed Fenestration U-factor ≤ the Required Fenestration SHGC? Indicate Yes or No. If No, the project fails prescriptive compliance – specified fenestration U-factor must be reduced, or compliance may be attempted using the performance approach.
22. Proposed Fenestration SHGC (Windows): If necessary, enter the area-weighted average SHGC from the complete CF1R-ENV-02. Otherwise, report the single largest associated value from columns F11 or F14.
23. Required Fenestration SHGC (Windows): From Section D., report the value of column 06a.
24. Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC? Indicate Yes or No. If No, the project fails prescriptive compliance – specified fenestration SHGC must be reduced, or compliance may be attempted using the performance approach.
25. Proposed Fenestration U-factor (Skylights): If necessary, enter the area-weighted average U-factor from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from F09.
26. Required Fenestration U-factor (Skylights): From Section D., report the value of column 05b.
27. Is the Proposed Fenestration U-factor ≤ the Required Fenestration U-factor? Indicate Yes or No. If No, the project fails prescriptive compliance – specified fenestration U-factors must be reduced, or compliance may be attempted using the performance approach.
28. Proposed Fenestration SHGC (Skylights): If necessary, enter the area-weighted average SHGC from the completed CF1R-ENV-02. Otherwise, report the single largest associated value from columns F11 or F14.
29. Required Fenestration SHGC (Skylights): From Section D., report the value of column 06b.
30. Is the Proposed Fenestration SHGC ≤ the Required Fenestration SHGC? Indicate Yes or No. If No, the project fails prescriptive compliance – specified fenestration SHGC must be reduced, or compliance may be attempted using the performance approach.

G. Space Conditioning (SC) Systems – Heating/Cooling

Requirements of the Standards apply to a heating and cooling system alteration based on the type of alteration and the system type (Section 150.2(b)1). A completely new system will meet all mandatory and prescriptive requirements, which vary by climate zone (based on Section 150.2(b)1C).

When parts of a system are replaced, it may trigger some of the same requirements that apply to new systems and duct alterations. A Certificate of Compliance for Alterations to Space Conditioning Systems (CF1R-ALT-02) is required for each dwelling unit with a space conditioning system alteration.

1. Dwelling Unit Name: Name of dwelling unit or any other identifying name.
2. SC System Identification or Name: Name of the space conditioning (SC) system or any other identifying name.
3. SC System Location or Area Served: Zone, or area, served by the space conditioning (SC) system.
4. Exemption from HERS Verification: Section 150.2(b)1E
    a. Space Conditioning (SC) System was not altered.
    b. Duct systems with less than 40 linear feet in unconditioned spaces as determined by visual inspection.
    c. Existing duct systems constructed, insulated or sealed with asbestos
    d. Duct systems that have been documented to have been previously sealed as confirmed through field verification and diagnostic testing in accordance with procedures in the Reference Residential Appendix RA3.1.

H. Water Heating Systems

Water heating compliance for an alteration is described in Section 150.2(b)1H. For a single dwelling unit, a gas or propane water heater can be used. If no natural gas is connected to the building, an electric water heater with an energy factor greater than or equal to the minimal energy factor required under the Appliance Efficiency Regulation, or an electric resistance storage type water heater with a storage capacity of less than 60 gallons can be used. For recirculation distribution systems, only demand recirculation systems with manual control pumps as specified in RA4.4 shall be used. If there is no natural gas connected to the building, an electric water heater may be replaced with another electric water heater. However, changing from gas to electric is not allowed. Multi-family central systems must use certified equipment as defined under Section 110.1 and 110.3.

1. Dwelling Unit Name: Name of dwelling unit or any other identifying name.
2. Water Heating System Identification or Name: Name of the Water Heating System or any other identifying name.
3. Water Heating System Location or Area Served: Zone, or area, served by the Water Heating System.
4. Water Heating System Type: Domestic Hot Water (DHW), Hydronic, Combined Hydronic, or Central. DHW is for domestic hot water, hydronic is a water heating system used for space heating only; combined hydronic is when the water heater will provide both space conditioning and domestic hot water.
5. Water Heater Type: For non-central systems only Small Storage or Small Instantaneous are allowed. For central systems pick from Large Storage, Small Storage, Heat Pump, Boiler, Large Instantaneous, Small Instantaneous or Indirect.
6. Number of Water Heaters in System: In single-family and multi-family with water heaters in each dwelling unit the value is 1. For multi-family central systems serving multiple dwelling units enter the total number of water heaters.
7. Water Heater Storage Volume: Tank capacity in gallons. For individual water heaters for a dwelling unit this will be 80 gallons or less. If instantaneous enter N/A. For multi-family central systems enter the total storage volume.
8. Fuel Type: Gas, Propane, Electric (Only if natural gas is not connected, or if the conditions of Section 150.2(b)1Hiiie are met)
    NOTE: The following table lists replacement heat pump water heating systems by climate zone that meet the requirements of 150.2(b)Hiiie.

Precalculated Replacement Heat Pump Water Heating Systems for Single Dwelling Units

CZ	Energy Factor greater than or equal to
1	2.75
2	2.75
3	2.75
4	2.8
5	2.75
6	2.33
7	2.5
8	2.33
9	2.33
10	2.33
11	2.5
12	2.8
13	2.5
14	2.5
15	2.33
16	EF ≥ 3, plus a solar water heating system with solar saving fraction ≥ 0.4

9. Rated Input Type: Enter the equipment input rating type. Btuh for gas or propane fired units and kW for electric fired systems.
10. Rated Input Value: Enter the numeric value of rated input.
11. Heating Efficiency Type: Energy Factor, AFUE, Thermal Efficiency, or Uniform Energy Factor. From product literature or California Energy Commission directory.
12. Heating Efficiency Value: Enter the value from product literature or California Energy Commission directory
13. Standby Loss (%): Applies only to large storage water heaters; enter N/A for small storage, instantaneous, or heat pump water heaters.
14. Exterior Insulation R-Value: Enter the R-value if exterior insulation on the storage tank is installed
15. Back-Up Solar Savings Fraction: If compliance requires a back-up solar system, indicate the solar contribution (e.g., 0.30). External calculations are required.

Documentation Declaration Statements

1. The person who prepared the CF1R will sign and complete the fields for their name, company (if applicable), address, phone number, certification information (if applicable), date and signature.
2. The person who is assuming responsibility for the project being built to comply with Title 24, Part 6, will complete the fields for their name, company (if applicable), address, phone number, license number (if applicable), date and signature.