

RESIDENTIAL ALTERATIONS

CEC-CF1R-ALT-01-E (Revised 06/14)

CALIFORNIA ENERGY COMMISSION



CERTIFICATE OF COMPLIANCE							CF1R-ALT-01-E
Prescriptive Residential Alterations							(Page 1 of 4)
Project Name:						Date Prepared:	

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 (ft2):		
11	Building Type			12	Slab Area (ft2)		
13	Project Scope:			:			

B. BUILDING INSULATION DETAILS (Section 150.2(b)1)											
01	02	03	04	05	06		07	08	09	10	11
Tag/ID	Assembly Type	Frame Type	Frame Depth (inches)	Frame Spacing (inches)	Proposed			Appendix JA4 Reference		Required U-Factor	Comments
					Cavity R-value	Continuous Insulation R-value	U-factor	Table	Cell		

C. ROOF REPLACEMENT (Prescriptive Alteration, Section 150.2(b)1H)													
01	02	03	04	05	06	07		08	09	10	11	12	13
Method of Compliance	Roof Pitch	Exception	CRRC Product ID Number	Product Type	R-value Deck Insulation	Proposed			Minimum Required				
						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.

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D. FENESTRATION/GLAZING AREAS ALLOWED (Section 150.2(b)1)			
01	02	03	04
Alteration Type	Orientation	Maximum Allowed ft2	Comments

E. FENESTRATION/GLAZING PROPOSED AREAS AND EFFICIENCIES (Section 150.2(b)1)															
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	
Tag/ ID	Fenestration Type	Frame Type	Dynamic Glazing	Orientation N, S, W, E, or Roof	Area Removed ft2	Area Added ft2	Net Added Area ft2	Maximum Allowed U-factor	U-factor	Source	SHGC	Source	Exterior Shading Device	Combined SHGC from CF1R-ENV-03	
a	Net Added West-facing Fenestration Area														
b	Existing + Added West-facing Fenestration Area														
c	Maximum Allowed West-facing Fenestration Area														
d	Is West-facing Fenestration Area \leq Maximum Allowed West-facing Fenestration Area														
e	Net Added Fenestration Area (all orientations)														
f	Existing + Added Fenestration Area (all orientations)														
g	Maximum Allowed Fenestration Area (all orientations)														
h	Is Existing + Added Fenestration Area \leq Maximum Allowed Fenestration Area (all orientations)														

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F. SPACE CONDITIONING(SC) SYSTEMS – HEATING/COOLING (Prescriptive section 150.2(b))

01	02	03
Dwelling Unit Name	Dwelling Unit CFA (Ft2)	Comments

G. WATER HEATING SYSTEMS (Section 150.2(b)1G)

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
Water Heating System Identification or Name	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 Insul. R-Value	Back-Up Solar Savings Fraction	Central DHW System Distribution Type	Dwelling Unit DHW System Distribution Type

H. SPACE CONDITIONING SYSTEMS AND WATER HEATING SYSTEMS IN MULTIFAMILY DWELLING UNITS

01	02	03	04	05	06
Dwelling Unit Name	Dwelling Unit Total CFA (ft2)	Central Water Heating System Identification or Name	Dwelling Unit Water Heating System Identification or Name	Dwelling Unit: Alteration to the Space Conditioning System(s)?	Comments

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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:	
<ol style="list-style-type: none"> The information provided on this Certificate of Compliance is true and correct. 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). 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. 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. 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.

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 2013 Building Energy Efficiency Standards (P400-2012-005). 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-01. Worksheets are identified by their entire name and subsequently by only the worksheet number, such as WS-02.

Instructions for sections with column numbers and row numbers 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

Project Name: Identifying information, such as owner's name.

Date: Date of document preparation.

Project Location: Legal street address of property or other applicable identifying information.

Compliance Method: Prescriptive.

CA City: Legal city/town of property.

Building Front Orientation: Building front 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 south of west.

Zip Code: 5-digit zip code for the project location (used to determine climate zone).

Number of Dwelling Units: 1 for single-family, 1 or more for multifamily.

Climate zone: From Joint Appendix JA2.1.1.

Fuel Type: Natural Gas, Liquefied Propane Gas, or Electricity. NOTE: prescriptive compliance only allows electricity if existing appliances are electric and natural gas is not available in the building.

Building Type: Single Family (includes duplex), or Multi Family (a building that shares common walls and common floors or ceilings).

Total Conditioned Floor Area: Enter the new conditioned floor area in ft², as measured from the outside of exterior walls of the dwelling unit or building being altered.

Project Scope: Check all that apply – insulation, roof replacement, fenestration/glazing, heating system, cooling system, duct system, and/or water heating alteration.

Slab Area: Area of the first floor slab (if any) in ft².

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, Floor over crawlspace or floor over exterior.
3. Frame Type: Wood or Metal.
4. Frame Depth: Nominal dimensions of framing material such as 4 (if 2x4) or 6 (if 2x6).
5. Frame Spacing: 16 or 24 inches on center.
6. Cavity R-value. Insulation installed between framing.

NOTE: Section 110.8(d) specifies that if adding insulation to an existing attic, the resulting attic insulation must total R-30. 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. U-factor: The U-factor for the entire wall, roof or floor assembly.
8. Appendix JA4 Table: Table number used to determine the R-value or U-factor (e.g., an attic assembly is 4.2.1).
9. Appendix JA4 Cell: Cell number used to determine the R-value or U-factor (e.g., an R-38 ceiling with 24-inch on center framing is A21).
10. Required U-factor: from mandatory requirements in Sections 110.0 and 150.0.
11. Comments or notes regarding location or unique condition.

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 (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 when a cool roof is required.

When the roof is steep slope (pitch greater than 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.

NOTES: EXCEPTIONS AND ALTERNATIVES FOR STEEP SLOPE ROOFS:

- (a) Mass roof 25 lbs/ft² 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-4 insulation above the roof deck.

In climate zones 13-15, when there is a low slope roof (pitch 2:12 or less) 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/ft² or greater (uncommon situation such as sod roof);
- (b) No ducts are installed in the attic; or
- (c) Roof deck installation—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 than the rest of Section c is Not Required.

4. 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 insulation.
7. Proposed Initial Solar reflectance: base on the product chosen from the Cool Roof Rating Council’s Rated Product Directory. If using default assumption indicate NA 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 calculated Aged Solar reflectance using the Solar Reflectance Index (SRI) Calculation worksheet 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 either the SRI but if chosen to do so, use the Solar Reflectance Index (SRI) Calculation Worksheet found on the California Energy Commission website <http://www.energy.ca.gov/title24/>.
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 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 AREAS ALLOWED

The climate zone and size of the addition will affect the amount of fenestration (also known as glazing) allowed. If limited to 20%, this is calculated as Conditioned Floor Area x 0.20 = total ft² of fenestration allowed (20%). Fenestration areas are expressed in feet, not inches. When west-facing fenestration is limited (in climate zones 2, 4, and 6-16), it is limited to a maximum of 5%. Additions of 1,000 ft² or less have alternate requirements. For example, the limit may be 120 ft² of fenestration or 25%. While west-facing fenestration may be limited, if there is no west fenestration the upper limit remains at 120 ft² or 25% (or the values shown in columns 2 and 3).

The Alteration Type 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 ft² of fenestration allowed (20%). Depending on the climate zone, If west-facing fenestration is limited, it is limited to a maximum of 5%. The overall total fenestration area is limited to 20%, not 25%. Fenestration areas are expressed in feet, not inches.

1. Alteration Type. Enter **Repair, Replace75, ReplaceALL, Add75, Add76, ReplaceSky, Add16Sky, or AddSky** as describe below:

Repair: A repair is when glass in an existing sash and frame is replaced or replacement of sashes in an existing frame. Repairs are not required to meet any requirements of the energy efficiency standards.

Replace75: When up to 75 ft² of fenestration is replaced, the replacement vertical fenestration must meet a maximum 0.40 U-factor and in climate zones 2, 4, 6-16 a maximum 0.35 SHGC.

ReplaceAll: When all fenestration (with an area of greater than 75 ft²) is replaced, the new fenestration product must have a maximum U-factor of 0.32 and in climate zones 2, 4, 6-16 a maximum SHGC of 0.25. This alteration does not trigger the area limits of Package A.

Add75: When adding fenestration up to 75 ft², the selected fenestration product must have a maximum U-factor of 0.32 and in climate zones 2, 4, 6-16 a maximum SHGC of 0.25. This alteration does not trigger the area limits of Package A.

Add76: When more than 75 ft² is added to the existing fenestration, in addition to the above requirements, the maximum fenestration area of the dwelling unit cannot exceed 20% and the maximum West-facing fenestration area (in climate zones 2, 4, 6-16) cannot exceed 5%.

ReplaceSky: When an equal area of existing skylights is replaced, the replacement skylights must meet a maximum 0.55 U-factor and in climate zones 2, 4, 6-16 a maximum 0.30 SHGC.

Add16Sky: When up to 16 ft² of skylight area is added, the product selected must meet a maximum U-factor of 0.55 and in climate zones 2, 4, 6-16 a maximum 0.30 SHGC.

AddSky: When greater than 16 ft² of skylight area is added, the product selected must meet a maximum U-factor and SHGC of Table 150.1-A, which is a maximum 0.32 U-factor and in climate zones 2, 4, 6-16 a maximum 0.25 SHGC.

The remaining fields are auto completed based on alteration type, conditioned floor area, and climate zone.

2. Orientation: In climate zones with a west-facing limit (2, 4, 6-16), two values will be displayed, one for west and one for the other orientations (E, S, and W).
3. Maximum Allowed ft²: If West-facing fenestration is limited two rows will appear. West-facing fenestration area is limited to 5%, and the maximum total fenestration area is 20%. Depending on the type of fenestration and the alteration type, this field may show values such as 75 ft² or 16 ft².

The values in these fields will be entered into the lower Section E, rows c and g.

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

E. FENESTRATION/GLAZING PROPOSED AREAS AND EFFICIENCIES

1. Tag/ID: A label (if any) from the plans, such as W1.

2. Fenestration Type: Window, glass door, skylight, glass block.
3. Frame type: Vinyl, wood, metal, metal thermal break, clad, fiberglass, or none.
4. Dynamic Glazing: Indicated 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). In climate zones where the West-facing glazing is limited, list west-facing individually. 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.

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 ft²: The size of window(s) being replaced or removed (combine windows with the same characteristics).

NOTE: Doors with glazing are counted in one of two ways. A door with 50% or more glazing is counted as the entire door area. A door with less than 50% glazing can be counted as the entire door area or can be calculated as the actual glass area with a 2-inch (0.17 ft²) frame all around.

7. Area Added ft²: The size of new or replacement window(s), doors, skylights.
8. Net Added Area ft²: The difference between columns 4 and 5 (can be a negative number if reducing the area).
9. Maximum Allowed U-factor: This field will vary depending on the type of alteration specified in Section D.

NOTE: For up to 3 ft² of tubular skylights and up to 3 ft² of glazing in a door, this field and column 8 can be n/a. For up to 16 ft² of skylight, enter 0.55.

10. 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 (c) the weighted average U-factor calculated on form CF1R-ENV-02-E, Area Weighted Average Calculation Worksheet. For the exceptions, up to 3 ft² of tubular skylights and up to 3 ft² of glazing in a door enter N/A, and for up to 16 ft² of skylight, enter 0.55. If any products (other than the exceptions) have a higher U-factor than 0.32, first complete a ENV-02 to calculate a weighted average U-factor and attach it to the 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 8 and 11.

11. Source: NFRC, Default or WS-02. The source of the U-factor data for the fenestration product.
12. Maximum Allowed SHGC: This field will vary depending on the type of alteration specified in Section D for climate zones 2, 4 and 6-16. In climate zones 1, 3 and 5, where there is no maximum SHGC requirement, this value is n/a.
13. Source: NFRC, Default (from Table 110.6-B) or ENV-02. The source of the SHGC data for the fenestration product.
14. 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).
15. Combined SHGC From CF-1R-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 I. 11), 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 a-h.

- a. 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.
- b. Existing + Added West-facing Fenestration Area: If more than 75 ft of fenestration is added, the dwelling unit cannot exceed 5% west-facing fenestration in climate zones 2, 4, and 6-16. Enter the area of West-facing fenestration ONLY that will be in the dwelling unit when alterations are complete.
- c. Maximum Allowed West-facing Fenestration Area: Conditioned Floor Area x 0.05 (for climate zones affected).
- d. Is West-facing Fenestration Area \leq Maximum Allowed West-facing Fenestration Area: Indicate Yes if west-facing fenestration area is less than or equal to the maximum area allowed, West-facing fenestration area is in compliance.
- e. Net Added Fenestration Area (all orientations): This field is to show the net area of added fenestration for all orientations. When limited, the maximum is either up to 75 ft² of added fenestration or a 20% limit is placed on the dwelling unit when alterations are complete. The total includes all existing and new fenestration, including the area of fenestration with exceptions for U-factor and SHGC.

- f. Existing + Added Fenestration Area (all orientations): If more than 75 ft² of fenestration is added, the dwelling unit cannot exceed 20% fenestration. Enter the area of all fenestration existing and new in the dwelling unit when alterations are complete (including West facing).
- g. Maximum Allowed Total Fenestration Area (all orientations). Conditioned Floor Area x 0.20.
- h. Is Existing + Added Fenestration Area \leq Maximum Allowed Total Fenestration Area: Indicate Yes if the total fenestration area is less than or equal to the maximum area allowed, the fenestration area is in compliance.

NOTE: If any fenestration has a U-factor greater than the maximum, with the exception of the 3 allowances for tubular skylights, glass in door, and skylights with 0.55 or less, complete a ENV-02 and attach it to the CF1R. If adding fenestration in climate zones with a maximum SHGC requirement, and any fenestration has an SHGC greater than required (with the exception of the 3 allowances for tubular skylights, glass in door, and skylights with 0.55 or less), complete a ENV-02 and attach it to the CF1R.

F. HVAC 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). [NOTE: Computer performance compliance can be used to trade-off any requirements that are not mandatory.] 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. Dwelling Unit CFA (ft²): Conditioned floor area in ft², as measured from the outside of exterior walls of the dwelling unit or building being altered.
3. Comments: Any notes regarding location or unique conditions.

G. WATER HEATING SYSTEMS

Water heating compliance for an alteration is described in Section 150.2(b). For single dwelling a gas or propane water heater, with a storage tank of 60 gallons maximum or instantaneous (tankless) can be used. Dwelling Unit distribution systems are limited to Standard trunk and branch or

demand recirculation for gas or propane water heater. Demand recirculation is not allowed for electric water heater. 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.

NOTE: If the proposed installation does not meet the requirements allowed specifically for alterations, use form CF1R-NCB-01 to document the water heater alteration.

1. Water Heating System Identification or Name: enter a unique name for the Water Heating System.
2. 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 are when the water heater will provide both space conditioning and domestic hot water.
3. 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.
4. Number of water heaters in system: In single-family and multi-family with water heaters in each dwelling units the value is 1. For multi-family central systems serving multiple dwelling units enter the total number of water heaters.
5. Water heater volume (gal): tank capacity in gallons. For individual water heaters for a dwelling unit this will be 60 gallons or less. If instantaneous, enter n/a. For multi-family central systems enter the total storage volume.
6. Fuel Type: Gas, Propane, Electric (Only if natural gas is not available)
7. Rated Input Type: Enter the equipment input rating type, for gas or propane fired units are Btuh, for electric fired system the units are kW.
8. Rated Input Value: Enter the numeric value of rated input.
9. Heating Efficiency Type: Energy Factor, AFUE, or Thermal Efficiency. From product literature or a California Energy Commission directory.
10. Heating Efficiency Value: Enter the value from product literature or a California Energy Commission directory
11. Standby Loss (percent): Applies only to large storage water heaters, Enter n/a for small storage or instantaneous water heaters.
12. Exterior Insulation R-Value: Enter the R-value if exterior insulation on the storage tank is installed
13. 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.
14. Central DHW Distribution System: For multi-family buildings with using a central distribution system a demand recirculation system with at least two distribution loops must be installed. This requirement applies to any building with eight or more units. If the system is non-central or project is individual units enter n/a.
15. Dwelling Unit DHW Distribution Type: For a Central DHW this field shall be Standard. If non-central then pick from Standard, Demand Recirculation – Manual Control, Demand Recirculation – Sensor Control. If non-central electric water heater this must be Standard, no recirculation system shall be installed.

H. SPACE CONDITIONING SYSTEMS AND WATER HEATING SYSTEMS IN MULTIFAMILY DWELLING UNITS

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). [NOTE: Computer performance compliance can be used to trade-off any requirements that are not mandatory.] 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. Dwelling Unit Total CFA (ft²): Conditioned floor area in ft², as measured from the outside of exterior walls of the dwelling unit or building being altered.
3. Central Water Heating System Identification or Name: select one of the central DHW system names.
4. Dwelling Unit Water Heating System Identification or Name: Select the applicable water heating system name(s) that were entered in section G or select n/a if no water heating systems are planned to be installed in this dwelling. If more than one water heating system type is needed in the dwelling unit, enter another row of data for the dwelling unit and select the additional water heating system name.
5. Alteration to the Space Conditioning System(s)? If altering one or more of the Space conditioning systems in the dwelling enter yes, otherwise enter no
6. Comments: Any notes regarding location or unique conditions.

SIGNATURES

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 (may be electronic).
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 (may be electronic).

REGISTRATION

1. The CF1R must be registered with a HERS provider prior to submitting for a building permit. See Residential Manual Section 2.1.1.