

<b>DOCKETED</b>	
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<b>Project Title:</b>	2019 ENERGY CODE COMPLIANCE MANUALS
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CERTIFICATE OF COMPLIANCE		CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification		(Page 1 of 9)
Project Name:	Date Prepared:	

*This compliance document is only applicable to additions less than or equal to 1,000 ft<sup>2</sup> and do not require HERS field verification for compliance. When HERS verification is required, a CF1R-ADD-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-ADD-02 and CF2R-ADD-02 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-ADD-01 and CF1R-ALT-02 must be completed and registered with a HERS Provider Data Registry.*

*Additions or 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-ADD-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):
05	CA City:		06 Number of Dwelling Units with Additions:
07	Zip Code:		08 Fuel Type:
09	Climate Zone:		10 Total Conditioned Floor Area (ft <sup>2</sup> ) (Addition):
11	Building Type:		12 Slab Area (ft <sup>2</sup> ):
13	Project Scope:		14 Exceptions to Fenestration U-factor and SHGC 150.1(c)3A:

# Prescriptive Residential Additions That Do Not Require HERS Field Verification



CERTIFICATE OF COMPLIANCE	CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification	(Page 2 of 9)
Project Name:	Date Prepared:

B. Opaque Surface Details – Framed (Section 150.2(a) and 150.1(c)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 from Table 150.1-A or B	Comments
					Cavity R-value	Continuous Insulation R-value	U-Factor	Table	Cell		



CERTIFICATE OF COMPLIANCE	CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification	(Page 3 of 9)
Project Name:	Date Prepared:

C. Opaque Surface Details – Nonframed Walls (Section 150.1(c)1)											
01	02	03	04	05	06	07	08	09	10	11	
Tag/ID	Assembly Type	Assembly Materials	Thickness (inches)	Proposed				Appendix JA4 Reference		Required	Comments
				Core Insulation R-value	Continuous Insulation R-value	U-Factor	Table	Cell	U-Factor from Table 150.1-A or B		

D. Opaque Surface Details – Mass Walls (Section 150.1(c)1)															
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16
Tag/ID	Above Grade/Below Grade	Mass Type	Mass Thickness	Proposed						Required					
				Appendix JA4 Ref		Interior		Exterior		Appendix JA4 Ref		Total Assembly U-factor	Interior R-value	Exterior R-value	Total Assembly U-factor
				Table	Cell	Furring Strip Thickness	Insulation R-value	Furring Strip Thickness	Insulation R-value	Table	Cell				



CERTIFICATE OF COMPLIANCE	CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification	(Page 4 of 9)
Project Name:	Date Prepared:

E. Slab Insulation (Table 150.1-A or Table 150.1-B)					
01	02	03	04	05	06
Floor Type	Proposed		Required		Comments
	Insulation R-value	Insulation U-factor	Insulation R-value	Insulation U-factor	

**Note:**

- Heated slab floors require mandatory slab insulation (see Table 110.8-A).

F. Radiant Barrier (Section 150.1(c)2)	
01	02
Radiant Barrier installed below the roof deck and on all gable end walls	Comments

**A radiant barrier is required (for Climate Zones 2-15)**

- Radiant barriers shall meet specific eligibility and installation criteria to receive credit for compliance with the Building Energy Efficiency Standards for low-rise residential buildings. Refer to RA4.2.1
- The emittance of the radiant barrier shall be less than or equal to 0.05 as tested in accordance with ASTM C1371 or ASTM E408.
- For Prescriptive Compliance the attic shall be ventilated to provide a minimum free ventilation area of not less than one square foot of vent area for each 300 ft<sup>2</sup> of attic floor area with a minimum of 40 percent to no more than 50 percent upper vents. Ridge vents or gable end vents are recommended to achieve the best performance. The material should be cut to allow for full airflow to the venting.



CERTIFICATE OF COMPLIANCE										CF1R-ADD-02-E	
Prescriptive Residential Additions That Do Not Require HERS Field Verification										(Page 5 of 9)	
Project Name:							Date Prepared:				

G. Roofing Products (Cool Roof) (Section 150.1(c)11)											
01	02	03	04	05	06	07	08	09	10	11	12
Exception	Roof Pitch	Method of Compliance	Product Type	CRRC Product ID Number	Proposed				Required		
					Initial Solar Reflectance	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)

**Notes:**

- Exception 1: Any roof area covered by building integrated photovoltaic panels and solar thermal panels are exempt from the above Cool Roof requirements.
- Exception 2: Roof constructions with weight of 25 lb/ft<sup>2</sup> are also exempt.
- Liquid field applied coatings must comply with installation criteria from section 110.8(i)4.

H. Fenestration/Glazing Allowed Areas and Efficiencies (Section 150.2(a)1)									
01	02	03	04	05	06	07	08	09	10
Addition Type ft <sup>2</sup>	Maximum Allowed Fenestration Area for All Orientations ft <sup>2</sup>		Maximum Allowed West-Facing Fenestration Area Only ft <sup>2</sup>		Maximum Allowed U-factor (Windows)	Maximum Allowed U-factor (Skylights)	Maximum Allowed SHGC (Windows)	Maximum Allowed SHGC (Skylights)	Comments
	The Greater		The Greater						
	Maximum Calculated based on Allowed %	Maximum Calculated Allowed ft <sup>2</sup>	Maximum Calculated based on Allowed %	Maximum Calculated Allowed ft <sup>2</sup>					



CERTIFICATE OF COMPLIANCE	CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification	(Page 6 of 9)
Project Name:	Date Prepared:

**I. Fenestration Proposed Areas and Efficiencies**

Note: If meeting Exception 1 to 150.1(c)3A, Installing  $\leq 3\text{ft}^2$  glass in door, or  $\leq 3\text{ft}^2$  tubular skylight, it is assumed to meet the minimum required U-factor (0.30) & SHGC (0.23).

If meeting Exception 2 to 150.1(c)3A, Installing  $\leq 16\text{ft}^2$  of new skylights, it is assumed to meet the minimum required U-factor (0.55) & SHGC (0.30).

Doors with greater than or equal to 25 percent glazing 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 $\text{ft}^2$	Proposed West Facing Fenestration Area $\text{ft}^2$	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	Total Proposed Fenestration Area $\leq$ Maximum Allowed Fenestration Area										<input type="checkbox"/> Yes <input type="checkbox"/> No	
18	Total Proposed West-Facing Fenestration Area												
19	Maximum Allowed West-Facing Fenestration Area												
20	Compliance Statement	Total Proposed West-Facing Fenestration Area $\leq$ Maximum Allowed West-Facing Fenestration Area										<input type="checkbox"/> Yes <input type="checkbox"/> No	
21	Proposed Fenestration U-factor (Windows)												
22	Required Fenestration U-factor (Windows)												
23	Compliance Statement	Proposed Fenestration U-factor $\leq$ Required Fenestration U-factor										<input type="checkbox"/> Yes <input type="checkbox"/> No	
24	Proposed Fenestration SHGC (Windows)												
25	Required Fenestration SHGC (Windows)												
26	Compliance Statement	Proposed Fenestration SHGC $\leq$ Required Fenestration SHGC										<input type="checkbox"/> Yes <input type="checkbox"/> No	
27	Proposed Fenestration U-factor (Skylights)												
28	Required Fenestration U-factor (Skylights)												
29	Compliance Statement	Proposed Fenestration U-factor $\leq$ Required Fenestration U-factor										<input type="checkbox"/> Yes <input type="checkbox"/> No	
30	Proposed Fenestration SHGC (Skylights)												
31	Required Fenestration SHGC (Skylights)												



CERTIFICATE OF COMPLIANCE	CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification	(Page 7 of 9)
Project Name:	Date Prepared:

32	Compliance Statement	Proposed Fenestration SHGC $\leq$ Required Fenestration SHGC	<input type="checkbox"/> Yes <input type="checkbox"/> No			
<b>J. Opaque Swinging Doors to Exterior</b> (Section 150.1(c)5)						
01	02	03	04	05	06	07
Tag/ID	Area	Proposed U-factor	Proposed U-factor Source	Required Maximum U-factor	Weighted Average (Yes/No)	Comments
Notes:						
<ul style="list-style-type: none"> <li>• Any door with 25 percent or more glass is considered a glazed door and is counted as a fenestration product in Tables H and I.</li> <li>• Do not include fire-rated doors between garage or unconditioned space, and conditioned space.</li> <li>• If using weighted average to achieve required maximum U-factor, attach CF1R-ENV-02-E.</li> </ul>						

<b>K. Space Conditioning (SC) Systems – Heating/Cooling</b> (Section 150.2(b))			
Alterations to space conditioning systems shall be exempt from HERS verification requirements as prerequisite for use of the CF1R-ADD-02 and CF2R-ADD-02 Compliance Documents. If new space conditioning systems are installed or existing systems are altered and are not exempt from HERS verification, then a CF1R-ADD-01 and 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:			
<input type="checkbox"/> a: space conditioning system was not altered; <input type="checkbox"/> b: less than 40 ft of ducts were added or replaced; <input type="checkbox"/> c: (exempt from duct leakage testing) if: the existing duct system was insulated with asbestos; <input type="checkbox"/> 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
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d
			<input type="checkbox"/> a <input type="checkbox"/> b <input type="checkbox"/> c <input type="checkbox"/> d





<b>CERTIFICATE OF COMPLIANCE</b>	<b>CF1R-ADD-02-E</b>
<b>Prescriptive Residential Additions That Do Not Require HERS Field Verification</b>	<b>(Page 8 of 9)</b>
Project Name:	Date Prepared:

**L. Water Heating Systems** (Section 150.2(a)1D)  
List water heaters and boilers for both domestic hot water (DHW) heaters and hydronic space heating.

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



CERTIFICATE OF COMPLIANCE		CF1R-ADD-02-E
Prescriptive Residential Additions That Do Not Require HERS Field Verification		(Page 9 of 9)
Project Name:	Date Prepared:	

<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>	
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:
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> <li>The information provided on this Certificate of Compliance is true and correct.</li> <li>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).</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>	
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-ADD-02-E User Instructions**

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

Minimum requirements for prescriptive addition compliance can be found in Building Energy Efficiency Standards Section 150.2(a), and Table 150.1-A or Table 150.1-B. Completing these forms will require that you have the Reference Appendices for the 2019 Building Energy Efficiency Standards (CEC-400-2018-020), which contain the Joint Appendices used to determine climate zone and to complete the section for opaque surfaces. When the term CF1R is used it means the CF1R-ADD-02. 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 numbers are given separately.

If any part of the addition does not comply, prescriptive compliance fails, in which case the performance (or computer) compliance approach may be used in an attempt to achieve compliance. Only the new construction is required to meet the requirements specified in this documentation. If any alterations to the existing building are occurring, those are documented on one or more of the CF1R-ALT forms.

**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. The Standards (section 100.1) include the following additional details for determining orientation:
  - 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 Dwelling Units with Additions: 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.

9. Climate Zone: From Joint Appendix JA2.1.1.
10. Total Conditioned Floor Area: Enter the new conditioned floor area, in ft<sup>2</sup>, as measured from the outside of exterior walls of the addition.
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 of the addition (if any) in ft<sup>2</sup>.
13. Project Scope: 300 ft<sup>2</sup> or less, greater than 300 ft<sup>2</sup> up to 400 ft<sup>2</sup>, greater than 400 ft<sup>2</sup> up to 700 ft<sup>2</sup>, or greater than 700 ft<sup>2</sup> up to 1000 ft<sup>2</sup>.
14. Exceptions to Fenestration U-factor and SHGC: Installing less than or equal to 3 ft<sup>2</sup> glass in door, Installing less than or equal to 3 ft<sup>2</sup> tubular skylight, Installing less than or equal to 16 ft<sup>2</sup> skylight, or NA.

**B. Opaque Surface Details - Framed**

Walls: Additions of any size must meet the requirements of Table 150.1-A or Table 150.1-B when using prescriptive compliance. However, extensions of existing walls require only R-15 wall insulation in 2x4 constructions, or R-21 wall insulation in 2x6 or larger constructions.

1. Tag/ID: A label (if any) from the plans, such as A1.4 or wall.
2. Assembly Type: Roof, Ceiling, Wall, Floor, Attic.

3. Frame Type: Wood or Metal.
4. Frame Depth: Nominal dimensions (in inches) of framing material 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 members.  
Proposed Continuous Insulation: R-value of rigid or continuous insulation (not interrupted by framing). See applicable table of the Reference Appendices for construction type.
7. Proposed U-factor: The U-factor for the proposed assembly must be less than or equal to column 10 or have an attached Area Weighted Average Calculation Worksheet (CF1R-ENV-02-E) to show that a weighted U-factor for multiple assemblies will meet the maximum value in column 10.
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-38 ceiling with 24-inch on center framing and no continuous insulation is A21).
10. Required U-factor or R-value: From Table 150.1-A or B. Value required based on climate zone and assembly type.
11. Comments: Any notes regarding location, unique conditions, or attachments.

**C. Opaque Surface Details – Non-Framed Walls**

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Assembly Type: Roof, Wall.
3. Assembly Materials: SIP OSB, SIP I-Joist, SIP Single 2x, SIP Double 2x, ICF see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Proposed Core Insulation R-value: Insulation installed within the materials or on the inside. See Joint Appendix JA4 for guidance.
6. Proposed Continuous Insulation R-value: Insulation installed on the exterior. See Joint Appendix JA4 for guidance.
7. Proposed U-factor: Proposed U-factor from JA4 or CF1R-ENV-02-E. Must be less than or equal to column 10.
8. Appendix JA4 Reference Table: Table number used to determine the R-value or U-factor (e.g., a SIP wall is 4.3.2).
9. Appendix JA4 Reference Cell: Cell number used to determine the R-value or U-factor (e.g., a 4.5-inch thick OSB wall with R-18 core insulation and no continuous insulation is A5).
10. Required U-factor from Table 150.1-A or B: Based on assembly type and climate zone.
11. Comments: Any notes regarding location, unique conditions, or attachments.

**D. Opaque Surface Details – Mass Walls**

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Above Grade/Below Grade: Indicate whether the mass wall is installed above grade or below grade.
3. Mass Type: Masonry, Clay Brick, Clay Hollow Unit, CMU Light Weight, CMU Medium Weight, CMU Normal Weight, Concrete. See Joint Appendix JA4 for guidance.
4. Mass Thickness: Thickness (in inches) of mass.
5. Appendix JA4 Reference Table: Table number used to determine the R-value or U-factor (e.g., an ICF wall is 4.3.13).
6. Appendix JA4 Reference Cell: Cell number used to determine the R-value or U-factor (e.g., an 8-inch thick ICF wall with 2 inches of EPS (R-15.4) is C1).
7. Interior Furring Strip Thickness: If furring strips are required to meet the required wall R-value, indicate the thickness of the furring strip (in inches). See Table 4.3.14 of JA 4.
8. Proposed Interior Insulation R-value : Enter the R-value of proposed insulation on the inside surface of the mass wall. See JA4 for guidance.
9. Exterior Furring Strip Thickness: If furring strips are required to meet the required wall R-value, indicate the thickness of the furring strip (in inches). See Table 4.3.14 of JA 4.
10. Proposed Exterior Insulation R-value: Enter the R-value of proposed insulation on the outside surface of the mass wall. See JA4 for guidance.
11. Appendix JA4 Reference Table: Table number used to determine the R-value or U-factor.
12. Appendix JA4 Reference Cell: Cell number used to determine the R-value or U-factor.
13. Total Assembly U-factor
14. Required Interior Insulation R-value: The required R-value for interior insulation will be completed based on the Table 150.1-A or Table 150.1-B requirements for the wall type.
15. Required Exterior Insulation R-value: The required R-value for exterior insulation will be completed based on the Table 150.1-A or Table 150.1-B requirements for the wall type.
16. Total Assembly U-factor

**E. Slab Insulation**

Slab edge performance specifications and installation criteria are found in Sections 150.0(l) and 150.1(c)1D (Table 150.1-A or Table 150.1-B). Requirements vary by climate zone and slab conditions.

1. Floor Type: Types include slab-on-grade or raised slab.
  - Unheated slab-on-grade floors require slab edge insulation in climate zone 16 only.
  - Raised slab must be insulated to R-8 in climate zones 1, 2, 11, 13, 14 and 16, R-4 in climate zones 12 and 15, and no insulation is required in climate zones 3-10.
2. Proposed Insulation R-value: When required, insulation can be specified by either R-value or U-factor. When specifying an R-value complete column 2. Use the same descriptor (R-value or U-factor) throughout Table E.
3. Proposed Insulation U-Factor: When required, specify the U-factor of proposed insulation in column 3. Use the same descriptor (R-value or U-factor) throughout Table E.
4. Required Insulation R-value: Specify the value required, which will vary by climate zone and type of slab. Values are from Table 150.1-A or Table 150.1-B.
5. Required Insulation U-factor: Specify the value required, which will vary by climate zone and type of slab. Values are from Table 150.1-A or Table 150.1-B.
6. Comments: Any notes regarding location, unique conditions, or attachments.

NOTE: There is a mandatory slab edge insulation requirement for heated slab floors. Since mandatory requirements are not listed on the Certificate of Compliance, this is provided for information purposes only. The specific requirements are in Sections 110.8(g) and Table 110.8-A.

**F. Radiant Barrier**

1. Radiant Barrier installed below the roof deck and on all gable end walls: Yes or No. Radiant barriers are required in climate zones 2-15.
2. Comments: Any notes regarding location, unique conditions, or attachments.

NOTE: Radiant barrier performance specifications and installation criteria are found in Sections 110.8(j) and 150.1(c)2, and in Residential Appendix RA4.2.1.

**G. Roofing Products (Cool Roof)**

Roofing requirements are found in Section 110.8(i) and 150.1(c)11. Depending on the climate zone and roof slope, a cool roof (defined as a minimum aged solar reflectance and thermal emittance, or a minimum SRI) may be required by Table 150.1-A or Table 150.1-B.

NOTE: Exceptions include (1) additions of 300 ft<sup>2</sup> or less, (2) low-slope roofs (pitch less than 2:12) in climate zones 1-12, 14 and 16; (3) steep slope roof (pitch greater than or equal to 2:12) in climate zones 1-9 and 16; (4) roof constructions that have thermal mass over the roof membrane with at least 25 lb/ft<sup>2</sup>; and (5) any roof area 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).

1. Exception: User indicates any exceptions. Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.
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. Method of Compliance: Indicate if the method of compliance is going to be based on Aged Solar Reflectance and Thermal Emittance or if it is going to be based on the Solar Reflectance Index (SRI).
4. Product Type: See Cool Roof Rating Council’s directory. Generally, product types include single-ply roof, wood shingles, asphalt roof, metal roof, tile roof.
5. 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](http://www.coolroofs.org/products/results). Products are listed by manufacturer, brand, type of installation, roofing material, and color, as well as product performance.
6. Proposed Initial Solar Reflectance: Based 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.
7. 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  $\beta$  is listed by product type below.

VALUES OF SOILING RESISTANCE  $\beta$  BY PRODUCT TYPE

Product Type	CRRC Product Category	$\beta$
Field-Applied Coating	Field-Applied Coating	0.65
Other	Not A Field-Applied Coating	0.70

8. Proposed Thermal Emittance: From the product specification default value. If using a calculated SRI, enter the Thermal Emittance used to calculate SRI.
9. 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/>.
10. Required Aged Solar Reflectance: Based on climate zone and roof slope.
11. Required Thermal Emittance: Based on climate zone and roof slope.
12. Required SRI: Based on climate zone and roof slope.

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.

**H. Fenestration/Glazing Allowed Areas and Efficiencies**

Fenestration areas are expressed in square feet, not square inches. The climate zone and size of the addition will affect the area of fenestration (also known as glazing) allowed. If limited to 20%, for example, this is calculated as Conditioned Floor Area (CFA) of the addition x 0.20 =total ft<sup>2</sup> of fenestration allowed.

For additions that are 1000 ft<sup>2</sup> or less, but greater than 700 ft<sup>2</sup>, the limit of total fenestration is the greater of 175 ft<sup>2</sup> or 20% of the CFA of the addition.

For additions that are 700 ft<sup>2</sup> or less, but greater than 400 ft<sup>2</sup>, the limit of total fenestration is the greater of 120 ft<sup>2</sup> or 25% of the CFA of the addition.

For additions that are 400 ft<sup>2</sup> or less, the limit of total fenestration is the greater of 75 ft<sup>2</sup> or 30% of the CFA of the addition.

For additions that are 1,000 ft<sup>2</sup> or less, when west-facing fenestration is limited (in climate zones 2, 4, and 6-15), it is limited to either 70 ft<sup>2</sup> or 5% of the CFA (for additions greater than 700 ft<sup>2</sup>) or 60 ft<sup>2</sup> (for additions that are 700 ft<sup>2</sup> or less).

1. Addition Type ft<sup>2</sup>: Based on "Project Scope." The addition's area in square feet: ≤400 ft<sup>2</sup>, >400 ft<sup>2</sup> to ≤700 ft<sup>2</sup>, or >700 ft<sup>2</sup> to ≤1,000 ft<sup>2</sup>.
2. - 9. These fields will be completed based on conditioned floor area of the addition and/or climate zone)

Maximum allowed fenestration area for all orientations is the greater of the values in columns 2 or 3:

2. Maximum Calculated based on Allowed %: The addition's CFA multiplied by the allowed %. The maximum total fenestration area is 30% for additions up to 400 ft<sup>2</sup>, 25% for additions greater than 400 ft<sup>2</sup> but no greater than 700 ft<sup>2</sup>, and 20% for additions greater than 700 ft<sup>2</sup>.
3. Maximum Calculated Allowed ft<sup>2</sup>: The maximum total fenestration area is 75 ft<sup>2</sup> for additions up to 400 ft<sup>2</sup>, 120 ft<sup>2</sup> for additions greater than 400 ft<sup>2</sup> but no greater than 700 ft<sup>2</sup>, and 175 ft<sup>2</sup> for additions greater than 700 ft<sup>2</sup>.

Maximum allowed west-facing area is the greater of the values in columns 4 or 5:

4. Maximum Calculated based on Allowed %: The maximum west-facing fenestration area (in climate zones 2, 4, and 6-15) is 5% for additions greater than 700 ft<sup>2</sup>.
5. Maximum Calculated Allowed ft<sup>2</sup>: The maximum west-facing fenestration area (in climate zones 2, 4, and 6-15) is 60 ft<sup>2</sup> for additions no greater than 700 ft<sup>2</sup>, and 70 ft<sup>2</sup> for additions greater than 700 ft<sup>2</sup>.

Addition CFA:	≤ 400 ft <sup>2</sup>		> 400 ft <sup>2</sup> to ≤ 700 ft <sup>2</sup>		> 700 ft <sup>2</sup> to ≤ 1,000 ft <sup>2</sup>	
	The Greater Of:		The Greater Of:		The Greater Of:	
Orientation	Percentage	Area (ft <sup>2</sup> )	Percentage	Area (ft <sup>2</sup> )	Percentage	Area (ft <sup>2</sup> )
West-facing (CZs 2, 4, 6-15)	-	60	-	60	5%	70
All Orientations	30%	75	25%	120	20%	175

NOTE: West includes any vertical fenestration oriented to within 45 degrees of true west (in either direction), including 45 degrees north of west, any skylights oriented west, and skylights facing any direction with a pitch of less than 1:12.

6. Maximum Allowed U-factor (Windows): Maximum area-weighted average of 0.30 for all climate zones.
7. Maximum Allowed U-factor (Skylights): Maximum area-weighted average of 0.30 for all climate zones, unless meeting one of the Exceptions to 150.1(c)3A. If meeting one of Exceptions, enter 0.55.
8. Maximum Allowed SHGC (Windows): Maximum area-weighted average of 0.23 for climate zones 2, 4, and 6-15; otherwise N/A.
9. Maximum Allowed SHGC (Skylights): Maximum area-weighted average of 0.23 for all climate zones, unless meeting one of the Exceptions to 150.1(c)3A. If meeting one of the Exceptions, enter 0.30.
10. Comments: Any notes regarding location, unique conditions, or attachments.

**I. Fenestration Proposed Areas and Efficiencies**

1. Tag/ID: Provide a name or designator for each unique type of fenestration surface. This designator should be used consistently throughout the plan set (elevations, finish schedules, etc.) such as Window-1, Skylight-1, etc. to identify each surface. It should also be consistently used on the other forms in the compliance documentation.
2. Fenestration Type: Indicate the type of fenestration construction e.g., Fixed Window, Operable Window, Skylight, Tubular Skylight, or Glass in Door.  
NOTE: Doors with glazing are counted in one of two ways. The entire area of a door with 25% or more glazing is considered a glazed door and is treated as fenestration. A door with less than 25% glazing can be considered an opaque swinging door, or can be calculated as the actual glass area with a 2-inch (0.17 ft) frame all around.
3. Frame Type: Metal, Metal Thermal Break, Nonmetal.
4. Dynamic Glazing: Indicate whether the fenestration has an integrated shading device, chromogenic glazing, or none for no dynamic glazing.  
NOTE: Chromogenic glazing shall be considered separately from other fenestration types.
5. Orientation: Orientation can be North, East, South, West, or degrees. If documentation is for a building that may be built in any direction, in a climate zone that limits west-facing fenestration, complete this section assuming the side of the building with the most fenestration faces west.  
NOTE: West includes any vertical fenestration oriented to within 45 degrees of true west, excluding 45 degrees south of west; any skylights oriented west; and skylights facing any direction with a pitch of less than 1:12.
6. Number of Panes: Indicate the number of panes for each Tag/ID; is it a single, double, or triple pane window? Enter either: 1, 2, or 3 to represent the panes.
7. Proposed Fenestration Area ft<sup>2</sup>: The size of any windows, doors with glass, or skylights within the floor area of the addition (combine windows with the same characteristics). Indicate the area (in square feet) of each exterior fenestration type, including west-facing fenestration.
8. Proposed West Facing Fenestration Area ft<sup>2</sup>: In climate zones 2, 4, and 6-15, enter the size of any west-facing windows, doors with glass, or skylights within the floor area of the addition. 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](http://www.nfrc.org)) certified values; or
  - (b) the default value from Table 110.6-A; or
  - (c) the NA6.2 alternate default U-factor (for non-rated site-built fenestration only); or
  - (d) the Area-weighted Average from CF1R-ENV-02-E.

If any products (other than the exceptions noted below) have a higher U-factor than 0.30, first complete a CF1R-ENV-02-E to calculate the area-weighted average U-factor, which must be 0.30 or less, and attach it to the CF1R-ADD-02-E.

- NOTES: (1) An exception allows up to 3 ft<sup>2</sup> of tubular skylights and up to 3 ft<sup>2</sup> of glazing in a door without having to meet the maximum U-factor; this field can be N/A. For up to 16 ft<sup>2</sup> of skylight area this value can be 0.55 or less.  
(2) 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 10.

10. Proposed U-factor Source: The source of the U-factor data for the fenestration product – indicate whether NFRC, Tables 110.6-A, Equations NA6-1, or Area-weighted Average Worksheet (ENV-02).
11. Proposed SHGC: In climate zones 2, 4, and 6-16, enter
  - (a) the NFRC SHGC based on the proposed brand and type of fenestration using National Fenestration Rating Council ([www.nfrc.org](http://www.nfrc.org)) certified values; or
  - (b) the default value from Table 110.6-B; or
  - (c) the NA6.3 alternate default SHGC (for non-rated site-built fenestration only); or
  - (d) the Area-weighted Average from CF1R-ENV-02-E.

If any products (other than the exceptions noted below) have a higher SHGC than 0.23 in a climate zone with a maximum SHGC value, first complete a CF1R-ENV-02-E to calculate the area-weighted average SHGC, which must be 0.23 or less, and attach it to the CF1R-ADD-02-E.

- NOTES: An exception allows up to 3 ft<sup>2</sup> of tubular skylights and up to 3 ft<sup>2</sup> of glazing in a door without having to meet the maximum SHGC; this field can be N/A. For up to 16 ft<sup>2</sup> of skylight area this value can be 0.30 or less.

12. Source: The source of the U-factor and SHGC data for the fenestration product—indicate whether NFRC, Tables 110.6-B, Equations NA6-2, or the Area-weighted Average Worksheet (ENV-02).
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-E Solar Heat Gain Coefficient Worksheet) and attach the CF1R-ENV-03-E.  
NOTES: An exterior shading device is not used for products with an NFRC rated U-factor and SHGC; based on a factory integrated shading device.



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 in column I. 11), 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 fenestration areas and efficiencies, complete rows 15-32.

15. Total Proposed Fenestration Area: The sum of column I. 07 plus I. 08.
16. Maximum Allowed Fenestration Area: From Section H., report the greater value of column 02 or 03.
17. Compliance Statement: Verify whether I. 15 is less than or equal to I. 16. 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.
18. Total Proposed West-Facing Fenestration Area: The sum of column I. 08.
19. Maximum Allowed West-Facing Fenestration Area: From Section H., report the greater value of column 04 or 05.
20. Compliance Statement: Verify whether I. 18 is less than or equal to I. 19. 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.
21. Proposed Fenestration U-factor (Windows): If necessary, report the area-weighted average U-factor from the completed CF1R-ENV-02-E. Otherwise, report the largest value from column I. 09.
22. Required Fenestration U-factor (Windows): From Section H., report the value of column 6.
23. Compliance Statement: Verify whether I. 21 is less than or equal to I. 22. 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.
24. Proposed Fenestration SHGC (Windows): If necessary, report the area-weighted average SHGC from the completed CF1R-ENV-02-E. Otherwise, report the largest value from column I. 11 or I. 14.
25. Required Fenestration SHGC (Windows): From Section H., report the value of column 08.
26. Compliance Statement: Verify whether I. 24 is less than or equal to I. 25. 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.
27. Proposed Fenestration U-factor (Skylights): If necessary, report the area-weighted average U-factor from the completed CF1R-ENV-02-E. Otherwise, report the single largest associated value from column I. 09.
28. Required Fenestration U-factor (Skylights): From Section H., report the value of column 07.
29. Compliance Statement: Verify whether I. 27 is less than or equal to I. 28. 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.
30. Proposed Fenestration SHGC (Skylights): If necessary, report the area-weighted average SHGC from the completed CF1R-ENV-02-E. Otherwise report the single largest associated value from column I. 11 or I. 14.
31. Required Fenestration SHGC (Skylights): From Section H., report the value from column 09.
32. Compliance Statement: Verify whether I. 30 is less than or equal to I. 31. 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.

#### J. Opaque Swinging Doors to Exterior

1. Tag/ID: Provide a name or designator for each unique door. This designator should be used consistently throughout the plan set (elevations, door schedules, etc.)
2. Area: Calculated area (in square feet) for each unique door.
2. Proposed U-factor: Enter the proposed U-factor. If value is greater than 0.20, column 06 will autocomplete as Yes.
3. Source: NFRC or Reference Joint Appendix Table 4.5.1, 110.6-A and 110.6-B, Equations NA6-1 and NA6-2, or Area-Weighted Average Worksheet (CF1R-ENV-02).
4. Required Maximum U-factor. This field will always be 0.20.
5. Weighted Average: If column 03 is greater than 0.20 U-factor, attach form CF1R-ENV-02-E:
6. Comments: Any notes regarding location, unique conditions, or attachments.

**K. Space Conditioning (SC) Systems – Heating/Cooling**

If an existing space conditioning system will condition an addition, the prescriptive requirements do not apply to that system (Exception 4 to Section 150.2(a)). The enforcement agencies may require verification that the capacity of the existing heating system is adequate to meet the added load of the additional conditioned floor area. Since there is no health and safety code requirement to provide cooling, the enforcement agency will not ask for verification that the capacity of the existing cooling system is adequate to meet the added load of the additional conditioned floor area.

If a new system is installed complete a Certificate of Compliance for Alterations to Space Conditioning Systems (CF1R-ALT-02).

1. Dwelling Unit Name: Name of dwelling unit or any other identifying name.
2. SC System Identification or Name: Name of the Space Condition (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

**L. Water Heating Systems**

Water heating compliance for an addition is described in Section 150.2(a)1D. When a water heater is added as part of an addition in a single dwelling the Prescriptive Standards allow five options under Section 150.1(c)8.

- (1) A single gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank.
  - (1) A single gas or propane storage type water heater with an input of 75,000 Btu per hour or less, rated volume less than or equal to 55 gallons and that meets the requirements of Sections 110.1 and 110.3. The dwelling unit shall have installed fenestration products with a weighted average U-factor of 0.24 or less and either:
    - A. A compact hot water distribution system that is field verified as specified in the Reference Appendix RA4.4.16; or
    - B. A drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9.
  - (2) A single gas or propane storage type water heater (small storage or consumer storage) with an input of 75,000 Btu per hour or less, rated volume greater than 55 gallons.
  - (3) A heat pump water heater located in the garage or conditioned space, and either:
    - C. A compact hot water distribution system as specified in the Reference Appendix RA4.4.6, and a drain water heat recovery system that is field verified as specified in the Reference Appendix RA3.6.9; or
    - D. In climate zones 2-15, a PV system with 0.3 kWdc capacity larger than the PV requirements; or
    - E. In climate zones 1 or 16, a PV system with 1.1 kWdc capacity larger than the PV requirements.
  - (4) A single NEEA Tier 3 heat pump water heater located in the garage or conditioned space, and:
    - A. In climate zones 1 or 16, a PV system with 0.3 kWdc capacity larger than the PV requirements, and
    - B. In climate zones 1 or 16, a compact hot water distribution system as specified in the Reference Appendix RA4.4.6.
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 instantaneous water heaters, enter N/A. For multi-family central systems enter the total storage volume.
  8. Fuel Type: Gas, Propane, or Electric (only if natural gas is not connected to the building).

9. Rated Input Type: Enter the equipment input rating type. Btu/h for gas or propane fired system units and kW for electric fired system the units.
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.