

<b>DOCKETED</b>	
<b>Docket Number:</b>	24-BSTD-03
<b>Project Title:</b>	2025 Energy Code Compliance Software, Manuals and Forms
<b>TN #:</b>	263582
<b>Document Title:</b>	2025 Single-Family Certificates of Installation (CF2R)
<b>Description:</b>	This draft Single-Family Certificates of Installation (CF2R) will be subject for vote during an Energy Commission Business Meeting. 2025 Energy Code compliance documents to record compliance with the 2025 Energy Code.
<b>Filer:</b>	Haile Bucaneg
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Commission Staff
<b>Submission Date:</b>	5/30/2025 1:36:13 PM
<b>Docketed Date:</b>	5/30/2025

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION**

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

*This compliance document is only applicable to addition that do not require field verification for compliance. When field verification is required, a CF1R-ADD-01 shall first be registered with an ECC-Provider Data Registry.*

*Alterations to Space Conditioning Systems that are exempt from field verification requirements may use the CF1R-ADD-02 and CF2R- ADD-02 Compliance Documents. Possible exemptions from duct leakage testing include: less than 25 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 an ECC-Rater. If space conditioning systems are altered and are not exempt from field verification, then a CF1R-ADD-01 and CF1R-ALT-02 must be completed and registered with an ECC-Provider Data Registry.*

*Additions or alterations that utilize closed 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 an ECC-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.*

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****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:				

**Insulation**

*The altered components shall comply with all applicable requirements in The Energy Standards, Sections 110.0-110.9, 150.0(a)-(q), and 150.2(a)1; All joints, penetrations and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exhalation.*

**B. Roof/Ceiling Insulation**

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Below Deck Insulation R-value

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Framed Wall Insulation**

01	02	03	04	05	06	07	08	09	10	11
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Wall Insulation R-value	Interior Wall Insulation R-value

**D. Masonry/Mass Wall Insulation**

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Above or Below Grade?	Masonry/Mass Wall Thickness (inches)	Furring Strip Type/ Depth (inches)	Insulation Type	Exterior Insulation R-value	Interior Insulation R-value



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. Raised Floor Insulation**

01	02	03	04	05	06	07	08	09	10	11
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Floor Insulation R-value	Interior Floor Insulation R-value

**F. Slab Floor/Perimeter Insulation**

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Floor Type	Insulation Type	Insulation Depth (inches)	Insulation R-Value	Vertical Insulation Length (inches)	Horizontal Insulation Length (feet)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Roofing and Radiant Barrier****G. Radiant Barrier**

01	Brand Name and Product Number	
02	Installation Type	
03	Total Attic Area (ft <sup>2</sup> )	

**H. Required Vent Area**

01	Combined net free area (NFA) of installed upper and lower vents (in <sup>2</sup> )	
02	Minimum required combined net free area (NFA) of upper and lower vents (in <sup>2</sup> )	
03	Net free area (NFA) of installed upper vents (in <sup>2</sup> )	
04	Minimum required net free area (NFA) of upper vents (in <sup>2</sup> )	

**I. Roofing Products (Cool Roof) Installation Information**

01	02	03	04	05	06	07	08
Roof Pitch	CRRC Product ID Number	Product Type	CRRC Listed Aged Solar Reflectance	Initial Solar Reflectance	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. Radiant Barrier and Attic Ventilation – Additional Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in Section J have been met.*

**Radiant Barrier**

01	Radiant barrier must be installed on all vertical surfaces in the attic including gable ends.
02	The emittance of the radiant barrier shall be less than or equal to 0.05 as tested with American Society for Testing and Materials (ASTM) C1371, or E408.
03	The product shall meet all requirements for California certified insulation materials [radiant barriers] of the Department of Consumer Affairs, Bureau of Household Goods and Services, as specified by California Referenced Standards Code ( <b>California Code of Regulations</b> ), Title 24, Part 12, Chapter 12-13, Standards for Insulating Material.
04	When determining the Total Attic Area, the area over unconditioned spaces such as the garage is included when the attic spaces are connected.

**Lower Vents**

05	Lower vents are within one foot of the eave.
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**Upper Vents**

06	Upper vents are within three feet of the ridge.
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**Vent Area**

07	The net free area (NFA) of upper vents must be within required NFA range of upper vents. Note: per Exception to R806.2 of the California Building Code (CBC) Title 24, Part2, Vol.2.5, if the net free ventilating area is less than 1:150, then the upper ventilation must be at least 40 percent and no more than 50 percent. Part 2 contains additional requirements that must be met if the area is less than 1:150.
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**K. Roofing Products (Cool Roof) – Additional Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in Section K have been met.*

01	Any roof area covered by building integrated photovoltaic (PV) panels and solar thermal panels are exempt from the above Cool Roof requirements.
02	Liquid field applied coatings must comply with installation criteria from section 110.8(i)4.
03	Mass roof 25 pounds per square foot (lb/ft <sup>2</sup> ) or greater: Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Fenestration****L. Fenestration/Glazing**

Note: If meeting Exception 1 to 150.1(c)3A, New dwelling units with a conditioned floor area of 500 square feet or less in Climate Zone 5 may comply with a maximum U-factor of 0.30.

If meeting Exception 2 to 150.1(c)3A, For each dwelling unit, up to 3 square feet of glazing area installed in doors and up to 3 square feet of tubular skylights area with dual-pane diffusers shall not be required to meet the U-factor and SHGC requirements of Table 150.1-A.

If meeting Exception 3 to 150.1(c)3A, In Climate Zones 2, 4, and 6 through 15, for each dwelling unit installing  $\leq 16$  square feet (ft<sup>2</sup>) of skylight shall meet a maximum U-factor of 0.40 and a maximum SHGC of 0.30. In Climate Zones 1, 3, 5, and 16 there is no SHGC requirement.

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
Tag/ID	Manufacturer/ Brand	Fenestration Area (ft <sup>2</sup> )	Orientation N, S, E, W	Chromogenic	U-factor	U-factor Source	SHGC	SHGC Source	Fenestration Type	Exterior Shading Devices (Describe)	Comments/Special Features

**M. Fenestration/Glazing – Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in Section M have been met.***

01	For existing buildings the U-factor and solar heat gain coefficient (SHGC) values should be the same or better than the required Energy Commission prescriptive requirements.
02	Temporary labels should not be removed until verified by the building inspector.
03	The fenestration product manufacturer's installation specifications shall be followed when installing these products. The space between the fenestration product and rough opening shall be completely filled with insulation. If batt insulation is used, it is cut to size and placed properly around the fenestration product.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Mechanical and Plumbing****N. Space Conditioning (SC) Systems – Heating/Cooling** (Section 150.2(b))

Alterations to Space Conditioning Systems shall be exempt from field 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 Field verification and diagnostic testing, then a CF1R-ADD-01 and CF1R-ALT-02 shall be completed and registered with an ECC-Provider Data Registry. In each row below for each space conditioning system, check the box that indicates the exemption from field verification and diagnostic testing compliance:

- ☐ a: space conditioning system was not altered;  
☐ b: less than 25 feet (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 an ECC-Rater.

01	02	03
SC System Identification or Name	SC System Location or Area Served	Exemption from field 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

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****O. Installed Water Heating Systems (Section 150.2(a)1D)**

Options:

1. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of Section 110.12(a) or has an ANSI/CTA-2045-B communication port; or
2. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
3. For addition that are 500 square feet or less, an electric water heater with point of use distribution as specified in the Reference Appendices, Residential Appendix, RA4.4.5

01	02	03	04	05	06	07
Water Heating System ID or Name	System Option (from §150.2(a)1D)	# of Water Heaters/ Compressors in System	Water Heater Type	Fuel Type	Tank Location	Distribution Type

**P. Installed Water Heater Manufacturer Information**

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Documentation Author's Declaration Statement**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed 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.
6. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ADD-02-E
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## CF2R-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 compliance documents will require that you have the Reference Appendices for the 2025 Building Energy Efficiency Standards, which contain the Joint Appendices used to determine climate zone. When the term CF2R is used it means the CF2R-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
7. Zip Code: 5-digit zip code for the project location (used to determine climate zone).
8. Fuel Type: Electricity.

NOTE: Prescriptive compliance only allows electricity if natural gas is not connected to the building.

9. Climate Zone: From Reference Appendices, Joint Appendix, JA2.1.1.



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10. Total Conditioned Floor Area: Enter the new conditioned floor area, in square feet (ft<sup>2</sup>), as measured from the outside of exterior walls of the addition.
11. Building Type: Single Family (includes duplex)
12. Slab Area: Area of the first floor slab of the addition (if any) in square feet (ft<sup>2</sup>).
13. Project Scope: Insulation, Roofing/Radiant Barrier, Fenestration, Heating System, Cooling System, Duct System, and/or Water Heating.

#### **B. Roof/Ceiling Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Roof) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing depth (e.g., 2x4, 2x6)
5. Frame Spacing: Indicate the framing spacing (e.g., 16 in O.C.); enter n/a if not applicable.
6. Insulation Type: List the type of insulation used, such as: Batt, Loose Fill, or SPF.
7. ESR Number: If using a non-standard R-value for SPF insulation, complete an ICC Evaluation Service Report and record the ESR number.
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Below Deck Insulation R-Value: Indicate the R-value of the insulation installed below the roof deck.

#### **C. Framed Wall Insulation**

1. I.D.: A label from the plans, (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing size and spacing (e.g., 2x4, 2x6)
5. Frame Spacing: Indicate the framing spacing (e.g., 16 in O.C.); enter n/a if not applicable.
6. Insulation Type: List the type of insulation used, such as: Batt, Loose Fill, or SPF.
7. ESR Number: If user using a non-standard R-value for SPF insulation, complete an ICC Evaluation Services Report and record the ESR number
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Exterior Wall Insulation R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the outside of the wall.
11. Interior Wall Insulation R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the inside of the wall.

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#### **D. Masonry/Mass Wall Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Above or Below Grade?: Indicate the location of the insulation, such as: Above Grade, Below Grade.
4. Masonry/Mass Thickness: Indicate the thickness of the masonry/mass, in inches, the insulation is applied to.
5. Furring Strip Type/Depth: Indicate the type, and thickness, of furring material installed (e.g., wood/1.0 inch thick).
6. Insulation Type: List the type of insulation used, such as: Spray Polyurethane Foam (SPF), Expanded Polystyrene (EPS), or Ethylene Propylene Diene Monomer (EPDM).
7. Exterior Insulation R-Value: Indicate the R-value of the insulation installed on the outside of the assembly.
8. Interior Insulation R-Value: Indicate the R-value of the insulation installed on the inside of the assembly.

#### **E. Raised Floor Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Floor1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing size and spacing (e.g., 2x4, 2x6).
5. Frame Spacing: Indicate the framing spacing (e.g., 16 in O.C.).
6. Insulation Type: List the type of insulation used, such as: Batt, Loose Fill, or Spray Polyurethane Foam (SPF).
7. ESR Number: If user using a non-standard R-value for SPF insulation, complete an ICC Evaluation Services Report and record the ESR number.
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Exterior Floor Insulation R-Value: Indicate the R-value of insulation installed on the outside of the floor.
11. Interior Floor Insulation R-Value: Indicate the R-value of insulation installed on the inside of the floor.

#### **F. Slab Floor/Perimeter Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Slab Floor1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Floor Type: Indicate the type of floor the insulation is being applied to, such as: Heated Slab, Raised Slab or Slab on Grade.
4. Insulation Type: List the type of insulation used, such as: Ethylene Propylene Diene Monomer (EPDM), Polyisocyanurate (ISO), or Polystyrene.
5. Insulation Depth: Indicate, in inches, the depth of insulation installed.
6. Insulation R-Value: Indicate the insulation R-value being installed vertically and horizontally (if applicable).
7. Vertical Insulation Length: Indicate, in inches, the length of the insulation being installed.

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8. Horizontal Insulation Length: Indicate, in feet, the length of the insulation being installed from the outside edge of the vertical insulation to the center of the slab.

#### G. Radiant Barrier

1. Brand Name and Product Number: Indicate the brand name and product number of the product used.
2. Installation Type: Indicate the installation type from the following list:
  - i. Attached to underside of roof deck;
  - ii. Attached to bottom of truss/rafters;
  - iii. Attached between truss/rafters;
  - iv. Draped over top of truss/rafters;
  - v. Attached to underside of roof deck with air space; or
  - vi. Attached to underside of roof deck with baffle.

NOTE: One of these six installation methods must be used; no other methods are allowed.

3. Total Attic Area (ft<sup>2</sup>): Provide the total attic area over conditioned space. When determining the total attic area, the area over unconditioned spaces such as a garage is included when the attic spaces are connected. At least one square foot of net free venting area is required for each 300 square feet (ft<sup>2</sup>) of attic (1:300).

#### H. Required Vent Area

1. Combined net free area (NFA) of installed upper and lower vents (in<sup>2</sup>): Indicate the total combined NFA of installed upper and lower vents in square inches.
2. Minimum required combined net free area (NFA) of upper and lower vents (in<sup>2</sup>): Total attic area divided by 300 and multiplied by 144.
3. Net free area (NFA) of installed upper vents (in<sup>2</sup>): Indicate the total NFA of installed upper vents in square inches (in<sup>2</sup>).
4. Minimum required net free area (NFA) of upper vents (in<sup>2</sup>): Table H item 1 (combined NFA of installed upper and lower vents) multiplied by 0.3.

#### I. Roofing Products (Cool Roof) Installation Information

1. Roof Pitch: Indicate whether the roof pitch is less than 2:12 or greater than or equal to 2:12
2. CRRC Product ID Number: If a cool roof is installed, obtain the Product ID Number from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#).
3. Product Type: Indicate the product type being used.
4. CRRC Listed Aged Solar Reflectance: State whether the 3-year aged solar reflectance value of the product used is listed on the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#)—Yes or No.

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5. Initial Solar Reflectance: Indicate the initial solar reflectance value of the product used; obtained from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#).
6. Aged Solar Reflectance: Indicate the aged solar reflectance value of the product used; obtained from the Cool Roof Rating Council's (CRRC) product packaging label or [rated product directory](#).  
Note: If the 3-year aged value is not available then use the equation in Section 110.8(i)2 of the Energy Standards to calculate an aged solar reflectance. One can also use the "Calculated Aged Solar Reflectance" from the Solar Reflectance Index (SRI) Calculator" available at the [California Energy Commission's website](#).
7. Thermal Emittance: Indicate the thermal emittance value of the product used; obtained from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#). This can be either the initial or aged value.
8. Solar Reflectance Index (SRI): If applicable, obtain the value of the product used from the [Cool Roof Rating Council's \(CRRC\) rated products directory](#), or the "Solar Reflectance Index (SRI) Calculator" available at the [California Energy Commission's website](#).

#### J. Radiant Barrier and Attic Ventilation – Additional Requirements

This section contains additional requirements for Radiant Barriers, Lower Vents, Upper Vents, and Vent Area.

#### K. Roofing Products (Cool Roof) – Additional Requirements

This section contains additional requirements for Roofing Products.

#### L. Fenestration/Glazing

1. Tag/ID: The labeling format used in the plans - ensure each unique type is used consistently throughout the plan set (elevations, finish schedules, etc.) to identify each matching fenestration product, such as: Window-1, Skylight-1 etc. It should also be consistently used on the other forms in the same compliance documentation.
2. Manufacturer/Brand: Provide the manufacturer and brand name which identifies the fenestration product being installed.
3. Fenestration Area (ft<sup>2</sup>): Indicate the total installed surface area (ft<sup>2</sup>) of the fenestration.
4. Orientation: Indicate the orientation of the same like fenestration. Use different lines if the orientation of the same fenestration varies.  
Enter: N, S, E, or W.
5. Chromogenic: Is the glazing product chromogenic? Yes or No
6. U-factor: Indicate the specified U-factor of the fenestration product(s) being installed. Do not mix different types on the same line.
7. U-factor Source: NFRC, CEC Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). All windows installed must have a label certificate which identifies the window's efficiencies. NFRC rated products have a temporary label that can be looked up in the NFRC product directory at: <http://search.nfrc.org/search/searchDefault.aspx>.
8. SHGC: Indicate the specified SHGC of the fenestration product(s) being installed. Do not mix different types on the same line.

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9. SHGC Source: NFRC, CEC Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). All windows installed must have a label certificate which identifies the window's efficiencies. NFRC rated products have a temporary label that can be looked up in the NFRC product directory at: <http://search.nfrc.org/search/searchDefault.aspx>.
10. Fenestration Type: Provide a description of the window type, for instance, the frame material, coatings, whether it is operable or fixed.
11. Exterior Shading Devices: If exterior shading devices are installed in conjunction with fenestration then indicate the type used (e.g. sunscreens, vertical roller or shades, retractable or drop arm or operable awnings, or roll down blinds or slats); or if an overhang is, or will be installed.
12. Comments/Special Features: Additional information for the field inspector.

#### **M. Fenestration/Glazing – Additional Requirements**

This section contains additional requirements for Fenestration/Glazing.

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

If an existing system will condition an addition, the prescriptive requirements do not apply to that system (Exception 3 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.

1. Space Conditioning (SC) System Identification or Name: Name of the Space Conditioning (SC) System or any other identifying name.
2. Space Conditioning (SC) System Location or Area Served: Zone, or area, served by the Space Conditioning (SC) System.
3. Exemption from Field Verification: Section 150.2(b)1E
  - a. Space Conditioning (SC) System was not altered.
  - b. Duct systems with less than 25 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 Appendices, Residential Appendix, RA3.1.

#### **O. Installed 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 four options under Section 150.2(a)1D:

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ADD-02-E
Prescriptive Residential Additions That Do Not Require Field Verification	(Page 7 of 7)

1. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of Section 110.12(a) or has an ANSI/CTA-2045-B communication port; or
2. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
3. For addition that are 500 square feet or less, an electric water heater with point of use distribution as specified in the Reference Appendices, Residential Appendix, RA4.4.5

1. Water Heating System Identification or Name: Name of the Water Heating System or any other identifying name.
2. System Option (from §150.2(a)1D): Indicate the prescriptive system option: 1, 2, 3, or 4.
3. Number of Water Heaters/Compressors in System: Enter the total number of water heaters or compressors for each system.
4. Water Heater Type: Electric water heater, Heat pump water heater, NEEA Tier 3 or higher heat pump water heater.
5. Fuel Type: Electricity.
6. Tank Location: For heat pump water heaters, indicated whether the storage tank is located in the garage or conditioned space. Otherwise, enter 'n/a'.
7. Distribution Type: If pursuing Option 3, then this will be point of use distribution. Otherwise, enter 'Standard'.

#### P. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater.

1. Water Heating System ID or Name: Name of the Water Heating System or any other identifying name.
2. Manufacturer: Provide the manufacturer's name which identifies the water heater being installed.
3. Model Number: Provide the model number which identifies the water heater being installed.

#### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION**

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

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

*Alterations to Space Conditioning Systems that are exempt from field verification requirements may use the CF1R-ALT-05 and CF2R- ALT-05 Compliance Documents. Possible exemptions from duct leakage testing include: less than 25 feet (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 an ECC-Rater. If space conditioning systems are altered and are not exempt from field verification, then a CF1R-ALT-02 must be completed and registered with an ECC-Provider Data Registry.*

*Alterations that utilize closed 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 an ECC-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.*

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****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:				

**Insulation**

*The altered components shall comply with all applicable requirements in The Energy Standards, Sections 110.7, 110.8, 150.0; All joints, penetrations and other openings in the building envelope that are potential sources of air leakage shall be caulked, gasketed, weather stripped, or otherwise sealed to limit infiltration and exhalation.*

**B. Roof/Ceiling Insulation**

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Below Deck Insulation R-value



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Framed Wall Insulation**

01	02	03	04	05	06	07	08	09	10	11
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Wall Insulation R-value	Interior Wall Insulation R-value

**D. Masonry/Mass Wall Insulation**

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Above or Below Grade?	Masonry/Mass Wall Thickness (inches)	Furring Strip Type/ Depth (inches)	Insulation Type	Exterior Insulation R-value	Interior Insulation R-value

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. Raised Floor Insulation**

01	02	03	04	05	06	07	08	09	10	11
I.D.	Manufacturer & Brand	Framing Type	Frame Depth (inches)	Frame Spacing (inches)	Insulation Type	ESR Number	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Floor Insulation R-value	Interior Floor Insulation R-value

**F. Slab Floor/Perimeter Insulation**

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Floor Type	Insulation Type	Insulation Depth (inches)	Insulation R-Value	Vertical Insulation Length (inches)	Horizontal Insulation Length (feet)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Roofing and Radiant Barrier****G. Radiant Barrier**

01	Brand Name and Product Number	
02	Installation Type	
03	Total Attic Area (ft <sup>2</sup> )	

**H. Required Vent Area**

01	Combined net free area (NFA) of installed upper and lower vents (in <sup>2</sup> )	
02	Minimum required combined net free area (NFA) of upper and lower vents (in <sup>2</sup> )	
03	Net free area (NFA) of installed upper vents (in <sup>2</sup> )	
04	Minimum required net free area (NFA) of upper vents (in <sup>2</sup> )	

**I. Roofing Products (Cool Roof) Installation Information**

01	02	03	04	05	06	07	08
Roof Pitch	CRRC Product ID Number	Product Type	CRRC Listed Aged Solar Reflectance	Initial Solar Reflectance	Aged Solar Reflectance	Thermal Emittance	SRI (Optional)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. Radiant Barrier and Attic Ventilation – Additional Requirements**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

**Radiant Barrier**

01	Radiant barrier must be installed on all vertical surfaces in the attic including gable ends.
02	The emittance of the radiant barrier shall be less than or equal to 0.05 as tested with American Society for Testing and Materials (ASTM) C1371, or E408.
03	The product shall meet all requirements for California certified insulation materials [radiant barriers] of the Department of Consumer Affairs, Bureau of Household Goods and Services, as specified by California Referenced Standards Code ( <b>California Code of Regulations</b> ), Title 24, Part 12, Chapter 12-13, Standards for Insulating Material.
04	When determining the Total Attic Area, the area over unconditioned spaces such as the garage is included when the attic spaces are connected.

**Lower Vents**

05	Lower vents are within one foot of the eave.
----	--

**Upper Vents**

06	Upper vents are within three feet of the ridge.
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**Vent Area**

07	The net free area (NFA) of upper vents must be within required NFA range of upper vents. Note: per Exception to R806.2 of the California Building Code (CBC) Title 24, Part 2, Vol. 2.5, if the net free ventilating area is less than 1:150, then the upper ventilation must be at least 40 percent and no more than 50 percent. Part 2 contains additional requirements that must be met if the area is less than 1:150.
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**K. Roofing Products (Cool Roof) – Additional Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in Section K have been met.*

01	Any roof area covered by building integrated photovoltaic (PV) panels and solar thermal panels are exempt from the above Cool Roof requirements.
02	Liquid field applied coatings must comply with installation criteria from section 110.8(i)4.
03	Mass roof 25 pounds per square foot (lb/ft <sup>2</sup> ) or greater: Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Fenestration****L. Fenestration/Glazing**

01	02	03	04	05	06	07	08	09	10	11	12
Tag/ID	Manufacturer/ Brand	Fenestration Area (ft <sup>2</sup> )	Orientation N, S, E, W	Chromogenic	U-factor	U-factor Source	SHGC	SHGC Source	Fenestration Type	Exterior Shading Devices (Describe)	Comments/Special Features

**M. Fenestration/Glazing – Additional Requirements**

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	For existing buildings the U-factor and solar heat gain coefficient (SHGC) values should be the same or better than the required Energy Commission prescriptive requirements.
02	Temporary labels should not be removed until verified by the building inspector.
03	The fenestration product manufacturer's installation specifications shall be followed when installing these products. The space between the fenestration product and rough opening shall be completely filled with insulation. If batt insulation is used, it is cut to size and placed properly around the fenestration product.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Mechanical and Plumbing****N. Space Conditioning (SC) Systems – Heating/Cooling (Section 150.2(b))**

Alterations to Space Conditioning Systems shall be exempt from Field 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 field verification, then a CF1R-ALT-02 shall be completed and registered with an ECC-Provider Data Registry. In each row below for each space conditioning system, check the box that indicates the exemption from field verification compliance:

- ☐ a: space conditioning system was not altered;
- ☐ b: less than 25 feet (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 an ECC-Rater.

01	02	03
SC System Identification or Name	SC System Location or Area Served	Exemption from field 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

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****O. Water Heating Systems** (Section 150.2(b)1H)

List water heaters and boilers for both domestic hot water (DHW) heaters and hydronic space heating.

Options:

1. Gas or propane water heating system; or
2. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of Section 110.12(a) or has a ANSI/CTA-2045-B communication port; or
3. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
4. If no natural gas is connected to the existing water heater location, a consumer electric water heater

01	Is natural gas connected to the existing water heater?			
02		03	04	05
Water Heating System ID or Name		System Option (from §150.2(b)1Hiii)	Water Heater Type	# of Water Heaters in System

**P. Installed Water Heater Manufacturer Information**

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ECC 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 Installation is true and correct.
2. I am eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation and attest to the declarations in this statement (responsible builder/installer), otherwise I am an authorized representative of the responsible builder/installer.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I reviewed a copy of the Certificate of Compliance approved by the enforcement agency that identifies the specific requirements for the scope of construction or installation identified on this Certificate of Installation, and I have ensured that the requirements that apply to the construction or installation have been met.
5. I understand that a completed signed 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.
6. I understand that a completed signed copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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



## CF2R-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 documents will require that you have the Reference Appendices for the 2025 Building Energy Efficiency Standards. This document contains the Joint Appendices which are used to determine climate zone. When the term CF2R is used it means the CF2R-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 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.
5. CA City: Legal city/town of property.
6. Number of Dwelling Units: 1 for single-family.
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.
9. Climate zone: From Reference Appendices, Joint Appendix, JA2.1.1.

10. Total Conditioned Floor Area: Enter the new conditioned floor area in square feet (ft<sup>2</sup>), as measured from the outside of exterior walls of the dwelling unit or building being altered.
11. Building Type: Single Family (includes duplex).
12. Slab Area: Area of the first floor slab (if any) in square feet (ft<sup>2</sup>).
13. Project Scope: Insulation, Roof Replacement, Fenestration/Glazing, Heating System, Cooling System, Duct System, and/or Water Heating System alteration.

#### **B. Roof/Ceiling Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Roof) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing depth (e.g., 2x4, 2x6)
5. Frame Spacing: Indicate the framing spacing (e.g. 16 in O.C.).
6. Insulation Type: List the type of insulation used, such as: Batt, Loose Fill, or Spray Polyurethane Foam (SPF).
7. ESR Number: If user using a non-standard R-value for SPF insulation, complete an ICC Evaluation Services Report and record the ESR number
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Below Deck Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed below the roof deck.

#### **C. Framed Wall Insulation**

1. I.D.: A label from the plans, (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing size and spacing (e.g., 2x4, 2x6).
5. Frame Spacing: Indicate the framing spacing (e.g. 16 in O.C.).
6. Insulation Type: List the type of insulation used, such as batt, loose fill, or SPF.
7. ESR Number: If user using a non-standard R-value for SPF insulation, complete an ICC Evaluation Services Report and record the ESR number
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Exterior Wall Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the outside of the wall.
11. Interior Wall Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the inside of the wall.

#### **D. Masonry/Mass Wall Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Above or Below Grade?: Indicate the location of the insulation, such as: Above Grade, Below Grade, Wall, or Roof.
4. Masonry/Mass Wall Thickness: Indicate the thickness of the masonry/mass, in inches, the insulation is applied to.
5. Furring Strip Type/Depth: Indicate the type, and thickness, of furring material installed (e.g., wood/1.0 inch thick).
6. Insulation Type: List the type of insulation used, such as: Spray Polyurethane Foam (SPF), Expanded Polystyrene (EPS), or Ethylene Propylene Diene Monomer (EPDM).
7. Exterior Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the outside of the assembly.
8. Interior Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the inside of the assembly.

#### **E. Raised Floor Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Floor1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Type: Wood or Metal.
4. Frame Depth: Indicate the framing size and spacing (e.g., 2x4, 2x6).
5. Frame Spacing: Indicate the framing spacing (e.g., 16 in O.C.).
6. Insulation Type: List the type of insulation used, such as: Batt, Loose Fill, or Spray Polyurethane Foam (SPF).
7. ESR Number: If user using a non-standard R-value for SPF insulation, complete an ICC Evaluation Services Report and record the ESR number.
8. Cavity Insulation R-value: Indicate the cavity insulation R-value.
9. Insulation Depth: Indicate, in inches, the amount of insulation installed.
10. Exterior Floor Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the outside of the floor.
11. Interior Floor Insulation R-Value: Indicate the R-value of the continuous insulation, having no framing penetration, installed on the inside of the floor.

#### **F. Slab Floor/Perimeter Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Slab Floor1) documenting the location of the installed insulation.
2. Manufacturer & Brand: Indicate the manufacturer and brand of the product being installed.
3. Floor Type: Indicate the type of floor the insulation is being applied to, such as: Heated Slab or Slab on Grade.

4. Insulation Type: List the type of insulation used, such as: Ethylene Propylene Diene Monomer (EPDM), Polyisocyanurate (ISO), or Polystyrene.
5. Insulation Depth: Indicate, in inches, the depth of insulation installed.
6. Insulation R-Value: Indicate the insulation R-value being installed vertically and horizontally (if applicable).
7. Vertical Insulation Length: Indicate, in inches, the length of the insulation being installed.
8. Horizontal Insulation Length: Indicate, in feet, the length of the insulation being installed from the outside edge of the vertical insulation to the center of the slab.

#### G. Radiant Barrier

1. Brand Name and Product Number: Indicate the brand name and product number of the product used.
2. Installation Type: Indicate the installation type from the following list:
  - i. Attached to underside of roof deck;
  - ii. Attached to bottom of truss/rafters;
  - iii. Attached between truss/rafters;
  - iv. Draped over top of truss/rafters;
  - v. Attached to underside of roof deck with air space; or
  - vi. Attached to underside of roof deck with baffle.

NOTE: One of these six installation methods must be used; no other methods are allowed.

3. Total Attic Area (ft<sup>2</sup>): Provide the total attic area over conditioned space. When determining the total attic area, the area over unconditioned spaces such as garage is included when the attic spaces are connected. At least one square foot of net free venting area is required for each 300 square feet of attic (1:300).

#### H. Required Vent Area

1. Combined net free area (NFA) of installed upper and lower vents (in<sup>2</sup>): Indicate the total combined NFA of installed upper and lower vents in square inches.
2. Minimum required combined net free area (NFA) of upper and lower vents (in<sup>2</sup>): Total attic area divided by 300 and multiplied by 144.
3. Net free area (NFA) of installed upper vents (in<sup>2</sup>): Indicate the total NFA of installed upper vents in square inches.
4. Minimum required net free area (NFA) of upper vents (in<sup>2</sup>): Table H item 1 (combined NFA of installed upper and lower vents) multiplied by 0.3.

### I. Roofing Products (Cool Roof) Installation Information

1. Roof Pitch: Indicate whether the roof pitch is less than 2:12 or greater than or equal to 2:12
2. CRRC Product ID Number: If a cool roof is installed, obtain the Product ID Number from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#).
3. Product Type: Indicate the product type being used.
4. CRRC Listed Aged Solar Reflectance: State whether the 3-year aged solar reflectance value of the product used is listed on the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#)—Yes or No.
5. Installed Initial Solar Reflectance: Indicate the initial solar reflectance value of the product used; obtained from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#).
6. Aged Solar Reflectance: Indicate the aged solar reflectance value of the product used; obtained from the CRRC product packaging label or rated product directory.

NOTE: If the 3-year aged value is not available then use the equation in Section 110.8(i)2 of the Energy Standards to calculate an aged solar reflectance. One can also use the "Calculated Aged Solar Reflectance" from the Solar Reflectance Index (SRI) Calculator" available at the [California Energy Commission's website](#).

7. Thermal Emittance: Indicate the thermal emittance value of the product used; obtained from the Cool Roof Rating Council's (CRRC) product packaging label or [rated products directory](#). This can be either the initial or aged value.
8. Solar Reflectance Index (SRI): If applicable, obtain the value of the product used from the [Cool Roof Rating Council's \(CRRC\) rated products directory](#), or the "Solar Reflectance Index (SRI) Calculator" available at the [California Energy Commission's website](#).

### J. Radiant Barrier and Attic Ventilation – Additional Requirements

This section contains additional requirements for Radiant Barriers, Lower Vents, Upper Vents, and Vent Area.

### K. Roofing Products (Cool Roof) – Additional Requirements

This section contains additional requirements for Roofing Products. Other exceptions apply for additions and/or alterations.

### L. Fenestration/Glazing

1. Tag/ID: The labeling format used in the plans - ensure each unique type is used consistently throughout the plan set (elevations, finish schedules, etc.) to identify each matching fenestration product, such as: Window-1, Skylight-1 etc. It should also be consistently used on the other compliance documents.
2. Manufacturer/Brand: Provide the manufacturer and brand name which identifies the fenestration product being installed.
3. Fenestration Area (ft<sup>2</sup>): Indicate the total installed surface area in square feet (ft<sup>2</sup>) of the fenestration.

4. Orientation: Indicate the orientation of the same like fenestration. Use different lines if the orientation of the same fenestration varies. Enter N, S, E, or W.
5. Chromogenic: Is the glazing product chromogenic? Yes or No
6. U-factor: Indicate the specified U-factor of the fenestration product(s) being installed. Do not mix different types on the same line.
7. U-factor Source: National Fenestration Rating Council (NFRC), California Energy Commission (CEC) Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6, or Area-weighted Average Worksheet (ENV-02). All windows installed must have a label certificate which identifies the window's efficiencies. NFRC rated products have a temporary label that can be looked up in the [NFRC product directory](#) at..
8. SHGC: Indicate the specified solar heat gain coefficient (SHGC) of the fenestration product(s) being installed. Do not mix different types on the same line.
9. SHGC Source: National Fenestration Rating Council (NFRC), California Energy Commissioner (CEC) Default, NA6 Alternative, or Area-weighted Average Worksheet (ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6, or Area-weighted Average Worksheet (ENV-02). All windows installed must have a label certificate which identifies the window's efficiencies. NFRC rated products have a temporary label that can be looked up in the [NFRC product directory](#) at.
10. Fenestration Type: Provide a description of the window type, for instance, the frame material, coatings, whether it is operable or fixed.
11. Exterior Shading Devices: If exterior shading devices are installed in conjunction with fenestration then indicate the type used (e.g., sunscreens, vertical roller or shades, retractable or drop arm or operable awnings, or roll down blinds or slats); or if an overhang is, or will be, installed.
12. Comments/Special Features: Additional information for the field inspector.

### M. Fenestration/Glazing – Additional Requirements

This section contains additional requirements for Fenestration/Glazing.

### N. 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. SC System Identification or Name: Name of the space conditioning (SC) system or any other identifying name.
2. SC System Location or Area Served: Zone, or area, served by the space conditioning (SC) system.

3. Exemption from Field Verification: Section 150.2(b)1E
  - a. Space Conditioning (SC) System was not altered.
  - b. Duct systems with less than 25 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 Appendices, Residential Appendix, RA3.1.

### O. Installed Water Heating System

Water heating compliance for an alteration is described in Section 150.2(b)1H.

Options:

1. Gas or propane water heating system; or
2. A single heat pump water heater. The storage tank shall not be located outdoors and shall be placed on an incompressible, rigid insulated surface with a minimum thermal resistance of R-10. The water heater shall be installed with a communication interface that meets either the requirements of Section 110.12(a) or has a ANSI/CTA-2045-B communication port; or
3. A single heat pump water heater that meets the requirements of NEEA Advanced Water Heater Specification Tier 3 or higher; or
4. If no natural gas is connected to the existing water heater location, a consumer electric water heater

NOTE: If the proposed installation does not meet the requirements allowed specifically for alterations, then use the computer performance approach to show compliance.

1. Is natural gas connected to the existing water heater? Yes or No.
2. Water Heating System Identification or Name: Name of the Water Heating System or any other identifying name.
3. Water Heating System Type: Domestic Hot Water (DHW), Hydronic, or Combined Hydronic. 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.
4. Water Heater Type: Electric water heater, Consumer Storage, Heat pump water heater, NEEA Tier 3 or Higher heat pump water heater
5. Number of Water Heaters in System: Enter the total number of water heaters for each system.

### P. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater.

1. Water Heating System ID or Name: Name of the water heating system or any other identifying name.
2. Manufacturer: Provide the manufacturer's name which identifies the water heater being installed.
3. Model Number: Provide the model number which identifies the water heater being installed.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FINAL BUT NOT READY TO USE



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

01	Project Scope	
----	---------------	--

**B. Battery Energy Storage System (BESS) Ready****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	BESS Ready interconnection equipment with minimum backed up capacity of 60 amps and a minimum of 4 BESS-supplied branch circuits specified in Section 150.0(s)2. OR A dedicated raceway from the main service to a panelboard(subpanel) that supplies the branch circuits in Section 150.0(s)2. All branch circuits are permitted to be supplied by the main service panel prior to the installation of a BESS. The trade size of the raceway shall be not less than one inch. The panelboard that supplies the branch circuits (subpanel) must be labeled "Subpanel shall include all backed-up load circuits."
02	A minimum of four branch circuits shall be identified and have their source of supply collocated at a single panelboard suitable to be supplied by the BESS. At least one circuit shall supply the refrigerator, one lighting circuit near the primary egress, and at least one circuit shall supply a sleeping room receptacle outlet.
03	The main panelboard shall have a minimum busbar rating of 225 amps.
04	Sufficient space shall be reserved to allow future installation of a system isolation equipment/transfer switch within 3 feet of the main panelboard. Raceways shall be installed between the panelboard and the system isolation equipment/transfer switch location to allow the connection of backup power source.
05	Exception to Section 150.0(s): Buildings which have a BESS installed.

**C. Heat Pump Space Heater Ready****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A dedicated 240 volt branch circuit wiring shall be installed within 3 feet from the furnace and accessible to the furnace with no obstructions.
02	The branch circuit conductors shall be rated at 30 amps minimum
03	The blank cover shall be identified as "240V ready".
04	All electrical components shall be installed in accordance with the <i>California Electrical Code</i> .
05	The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future heat pump space heater installation. The reserved space shall be permanently marked as "For Future 240V use".

**D. Electric Cooktop Ready****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A dedicated 240 volt branch circuit wiring shall be installed within 3 feet from the cooktop and accessible to the cooktop with no obstructions.
02	The branch circuit conductors shall be rated at 50 amps minimum.
03	The blank cover shall be identified as "240V ready".
04	All electrical components shall be installed in accordance with the <i>California Electrical Code</i> .
05	The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future electric cooktop installation. The reserved space shall be permanently marked as "For Future 240V use".



## ELECTRIC READY REQUIREMENTS

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ELC-01-E

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### E. Electric Clothes Dryer Ready

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	A dedicated 240 volt branch circuit wiring shall be installed within 3 feet from the clothes dryer location and accessible to the clothes dryer location with no obstructions.
02	The branch circuit conductors shall be rated at 30 amps minimum.
03	The blank cover shall be identified as "240V ready".
04	All electrical components shall be installed in accordance with the <i>California Electrical Code</i> .
05	The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future electric clothes dryer installation. The reserved space shall be permanently marked as "For Future 240V use".

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

**CF2R-ELC-01-E User Instructions****A. General Information**

1. Project Scope: User selects all that apply: Battery Energy Storage System Ready, Heat Pump Space Heater Ready, Electric Cooktop Ready, and Electric Clothes Dryer Ready

**B. Battery Energy Storage System Ready**

- 01 Mandatory requirement for all newly constructed building

**C. Heat Pump Space Heater Ready– Optional table based on user selection in cell A02:****D. Electric Cooktop Ready– Optional table based on user selection in cell A02.****E. Electric Clothes Dryer Ready – Optional table based on user selection in cell A02.****Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

*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. The signer agrees that all applicable Mandatory Measures were met. Temporary labels are not to be removed before verification by the building inspector.*

**A. Fenestration/Glazing**

Includes all Windows, Skylights, Greenhouse/Bay Windows, and Glazed Doors ( $\geq 25\%$  glazing area).

Note: If meeting Exception 1 to Section 150.1(c)3A, new dwelling units with a conditioned floor area of  $\leq 500$  square feet ( $\text{ft}^2$ ) in Climate Zone 5 may comply with a maximum U-factor of 0.30.

If meeting Exception 2 to 150.1(c)3A, for each dwelling unit, up to 3 square feet of glazing area installed in doors and up to 3 square feet of tubular skylights area with dual-pane diffusers shall not be required to meet the U-factor and SHGC requirements of Table 150.1-A.

If meeting Exception 3 to 150.1(c)3A, in Climate Zones 2, 4, and 6 through 15 for each dwelling unit installing  $\leq 16$  square feet ( $\text{ft}^2$ ) of skylight shall meet a maximum U-factor of 0.40 and a maximum SHGC of 0.30. In Climate Zones 1, 3, 5, and 16 there is no SHGC requirement.

If meeting Exception 3 to Section 150.2(b)1B, in Climate Zone 15, vertical fenestration shall have a maximum U-factor of 0.23.

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
Tag/ID	Manufacturer/Brand	Fenestration Area ( $\text{ft}^2$ )	Orientation	Chromogenic	U-factor	Source	SHGC	Source	Fenestration Type	Exterior Shading Devices (Describe)	Comments/Special Features

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B. Fenestration Installation**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The U-factor of the installed windows for new construction and existing buildings must be equal to or less than those listed on the CF1R.
02	The SHGC of the installed windows for new construction and existing buildings must be equal to or less than those listed on the CF1R in climate zones 2, 4 and 8-15. For climate zones 1, 3, 5 and 16 there is no SHGC requirement.
03	Temporary labels are not to be removed until verified by the building inspector.
04	The fenestration product manufacturer's installation specifications shall be followed when installing these products. The space between the fenestration product and rough opening shall be completely filled with insulation. If batt insulation is used, it is cut to size and placed properly around the fenestration product.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ENV-01-E
Fenestration Installation	(Page 1 of 2)

### CF2R-ENV-01-E User Instructions

Before installation of fenestration, the installer shall verify the fenestration product matches the CF1R (-ADD, -ALT, -NCB, or -PRF). If the efficiencies are worse (less efficient), then the windows cannot be installed until proof of compliance is shown with an updated certificate of compliance, or computer energy compliance run, documenting the less efficient windows. If the installed fenestration is better (more efficient) than the documentation shows, no updated documentation is required and installation is allowed.

#### A. Fenestration/Glazing

1. Tag/ID: The labeling format used in the plans ensures each unique type is used consistently throughout the plan set (elevations, finish schedules, etc.) to identify each matching fenestration product, such as: Window-1, Skylight-1 etc. It should also be consistently used on the other compliance documents for this project.
2. Manufacturer/Brand: Provide the manufacturer and brand name which identifies the fenestration product being installed.
3. Fenestration Area (ft<sup>2</sup>): Indicate the total installed surface area in square feet (ft<sup>2</sup>) of the fenestration.
4. Orientation: Indicate the orientation of the same like fenestration. Use different lines if the orientation of the same fenestration varies. Enter N, S, E, or W.
5. Chromogenic: Is the glazing product chromogenic? Yes/No
6. U-factor: Indicate the specified U-factor of the fenestration product(s) being installed. Do not mix different types on the same line.

#### NOTES:

- (1) If meeting Exception 1 to Section 150.1(c)3A, new dwelling units with a conditioned floor area of  $\leq 500$  square feet (ft<sup>2</sup>) in Climate Zone 5 may comply with a maximum U-factor of 0.30.
- (2) If meeting Exception 2 to 150.1(c)3A, for each dwelling unit, up to 3 square feet of glazing area installed in doors and up to 3 square feet of tubular skylights area with dual-pane diffusers shall not be required to meet the U-factor requirements of Table 150.1-A.
- (3) If meeting Exception 3 to 150.1(c)3A, in Climate Zones 2, 4, and 6 through 15, for each dwelling unit installing  $\leq 16$  square feet (ft<sup>2</sup>) of skylight shall meet a maximum U-factor of 0.40.
7. Source: NFRC, CEC Default, NA6 Alternative, or Area-Weighted Average Worksheet (CF1R-ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6, or Area-Weighted Average Worksheet (CF1R-ENV-02). All fenestration products installed must have a label certificate which identifies the product's efficiencies. NFRC rated products have a temporary label that can be looked up in the NFRC product directory (<http://search.nfrc.org/search/searchDefault.aspx>).
8. SHGC: Indicate the specified SHGC that is being installed of the fenestration product(s). Do not mix different types on the same line.



CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ENV-01-E
Fenestration Installation	(Page 2 of 2)

#### NOTES:

- (1) If meeting Exception 2 to 150.1(c)3A, for each dwelling unit, up to 3 square feet of glazing area installed in doors and up to 3 square feet of tubular skylights area with dual-pane diffusers shall not be required to meet the SHGC requirements of Table 150.1-A.
  - (3) If meeting Exception 3 to 150.1(c)3A, in Climate Zones 2, 4, and 6 through 15, for each dwelling installing  $\leq 16$  square feet (ft<sup>2</sup>) of skylight shall meet a maximum SHGC of 0.30. In Climate Zones 1, 3, 5, and 16 there is no SHGC requirement.
  - (4) If meeting Exception 3 to 150.2(b)1B, in Climate Zone 15, vertical fenestration shall have a maximum SHGC value of 0.23.
9. Source: NFRC, CEC Default, NA6 Alternative, or Area-Weighted Average Worksheet (CF1R-ENV-02). Enter the appropriate temporary label certificate identified as NFRC, CEC Default, NA6, or Area-Weighted Average Worksheet (CF1R-ENV-02). All fenestration products installed must have a label certificate which identifies the product's efficiencies. NFRC rated products have a temporary label that can be looked up in the NFRC product directory (<http://search.nfrc.org/search/searchDefault.aspx>).
  10. Fenestration Type: Provide a description of the product; for instance, the frame material, coatings, whether it is operable or fixed.
  11. Exterior Shading Devices: If exterior shading devices are installed in conjunction with fenestration, then indicate the type used (e.g. sunscreens, vertical roller or shades, retractable or drop arm or operable awnings, or roll down blinds or slats); or if an overhang is, or will be, installed.
  12. Comments/Special Features: Additional information for the field inspector.

#### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Roof/Ceiling Insulation**

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Assembly/ Framing Material	Assembly Thickness (inches)	Framing Size & Spacing	Insulation Type	Ceiling Insulation R-value	Insulation Depth (inches)	Continuous Insulation Above the Roof Deck R-value	Insulation Below the Roof Deck R-value

**B. Wall Insulation**

01	02	03	04	05	06	07	08	09	10
I.D.	Manufacturer & Brand	Assembly/ Framing Material	Assembly Thickness (inches)	Framing Size & Spacing	Insulation Type	Core/Cavit y Insulation R-value	Insulation Depth (inches)	Continuous Exterior Insulation R-value	Continuous Interior Insulation R-value

**C. Masonry/Mass Insulation**

01	02	03	04	05	06	07	08	09
I.D.	Manufacturer & Brand	Walls Above Grade	Masonry/ Mass Thickness (inches)	Exterior Furring Strip Type/ Depth (inches)	Interior Furring Strip Type/Depth (inches)	Insulation Type	Exterior Insulation R-value	Interior Insulation R-value

**D. Raised Floor Insulation**

01	02	03	04	05	06	07	08	09
I.D.	Manufacturer & Brand	Framing Material	Framing Size & Spacing	Insulation Type	Cavity Insulation R-value	Insulation Depth (inches)	Exterior Floor Insulation R-value	Concrete Fill

**E. Slab Floor/Perimeter Insulation (See Section F. for Insulation Requirements for Heated Slabs)**

01	02	03	04	05	06	07	08
I.D.	Manufacturer & Brand	Floor Type	Insulation Type	Insulation Depth (inches)	Insulation R-Value	Vertical Insulation Length (inches)	Horizontal Insulation Length (feet)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Heated Slab Insulation**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	All heated slabs shall be insulated as required by Section 110.8(g). Footings must meet required insulation levels.
02	Insulation shall be installed from the top of the slab, down 16 inches or to the frost line, whichever is greater. Climate zones 1-15 requires R-5, climate zone 16 requires R-10.
03	Alternatively, vertical insulation from top of slab at inside edge of outside wall down to the top of the horizontal insulation. Horizontal insulation from the outside edge of the vertical insulation extending 4 feet toward the center of the slab in a direction normal to the outside of the building in plain view. Climate zones 1-15 require R-5, and climate zone 16 requires R-10 vertical and R-7 horizontal.

**G. Minimum Mandatory Measures**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	<b>Insulation</b> - 110.8(a): All installed insulation is certified and listed with the Department of Consumer Affairs, Bureau of Household Goods and Services.
02	<b>Insulation</b> - 110.8(b)2: Urea formaldehyde foam insulation is protected by 4 mil polyethylene vapor retarder.
03	<b>Insulation</b> - 110.8(c): Flame spread and smoke density requirements of the California Building Code (CBC) are met.
04	<b>Raised Floor</b> - 150.0(d): All raised wood-frame floors have a minimum R-19 insulation or equivalent U-factor.
05	<b>Slab Floor/Perimeter</b> - 150.0(f): Water absorption rate for the insulation material alone without facings is no greater than 0.3%; water vapor permeance rate is no greater than 2.0 perm/inch, and perimeter insulation is protected from physical damage and UV light deterioration.
06	<b>Above Grade Exterior Wall</b> - 150.0(c)1 & 150.0(c)6: All 2x4 wood-frame walls have a minimum R-13 insulation or equivalent U-factor not exceeding U-0.095.
07	<b>Above Grade Exterior Wall</b> - 150.0(c)2 & 150.0(c)6: All 2x6 wood-frame walls have a minimum R-20 insulation or equivalent U-factor not exceeding U-0.069.
08	<b>Roof Deck</b> - 150.0(a)1: All newly constructed attics that are above conditioned space have a maximum area-weighted average U-factor not exceeding U-0.184.
09	<b>Ceiling/Rafter Roof</b> - 150.0(a)2: All wood-framed ceilings have a minimum R-22 insulation or equivalent U-factor.
10	<b>Vapor Retarder</b> – 150.0(g)1: In Climate Zones 1 through 16, the earth floor of unvented crawl space shall be covered with a Class I or Class II vapor retarder. This requirement shall also apply to controlled ventilation crawl space for buildings complying with the Exception to Section 150.0(d).
11	<b>Vapor Retarder</b> – 150.0(g)2: In Climate Zones 14 and 16, a Class I or Class II vapor retarder shall be installed on the conditioned space side of all insulation in all exterior walls, vented attics and unvented attics with air-permeable insulation.
12	<b>Heated Slabs</b> - 110.8(g): All heated slabs shall be insulated as required. <ul style="list-style-type: none"> <li>Insulation shall be installed from the top of the slab, down 16 inches or to the frost line, whichever is greater. Climate zones 1-15 require R-5, and climate zone 16 requires R-10.</li> <li>Alternatively, vertical insulation from top of slab at inside edge of outside wall down to the top of the horizontal insulation. Horizontal insulation from the outside edge of the vertical insulation extending 4 feet toward the center of the slab in a direction normal to the outside of the building in plain view. Climate zones 1-15 require R-5, and climate zone 16 requires R-10 vertical and R-7 horizontal.</li> </ul>

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Installed Insulation**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Installed insulation R-values are the same or greater than listed on the CF1R.
02	No gaps or voids between the insulation and framing.
03	No gaps between the sides or ends of batt insulation.
04	Loose-fill insulation must be installed to the minimum installed weight per square foot (density) of the manufacturer's cut sheet for the proposed R-value.
05	Batt insulation is not compressed (no stuffing of the insulation into the cavity) and is installed to its full thickness.
06	Insulation is cut around obstructions such as electrical boxes.
07	Batt insulation is delaminated around all plumbing and electrical lines in ceilings, walls, and floors.
08	Band joists are insulated to the same R-value as the wall.
09	In all narrow cavities the insulation shall be cut to fit or filled with expanding foam.
10	Insulation was installed per manufacturer instructions.

**I. Wall Insulation**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	When allowed by the manufacturer, low expanding foam shall be used to fill gaps and voids around windows and doors. If not, the cavity must be airtight and filled completely with insulation. Batt insulation must be cut to width. No stuffing allowed.
02	Install wall insulation before installing tubs, showers, and fireplaces.
03	Electric panels on walls separating conditioned and unconditioned space are sealed and insulated behind the panel with rigid insulation or expanding foam.
04	All walls of interior closets vented to the outside for HVAC or water heating equipment have the same R-value and air barrier as the exterior walls and ceiling. Doors are insulated and weather stripped.
05	Ducting is not allowed in exterior walls unless it is insulated to R-6 or greater, and the insulation and ducting are not crushed. .
06	Corner channels, wall intersections, and double sided shear walls are insulated to the required R-value before enclosing the wall.
07	Insulation that does not fill the cavity is placed against the exterior air barrier.
08	Band joists are insulated to the same R-value as the walls.

**J. Ceiling/Roof Insulation**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Insulation extends to the outside edge of the exterior top plates and is flush against any ventilation dams/baffles.
02	Insulation is in direct contact with ceiling, so there are no gaps between the ceiling and the insulation.
03	For chimneys and flues, the insulation is in contact with the sheet metal collar.
04	Can lights are covered with insulation to the same depth as required by the CF1R for ceiling insulation. If not, an area weighted calculation is required to be turned in with this compliance document (CF1R-ENV-02-E).
05	Walkways and mechanical platforms are insulated to the same R-value as required for the ceiling. If not, an area weighted calculation is required to be turned in with this compliance documents (CF1R-ENV-02-E).
06	Insulate soffits by adding an air barrier and covering with insulation, or insulate the entire soffit including floor and walls.
07	Knee walls and skylight shafts are insulated to the wall R-value and in full contact with the interior air barrier. If framing on these surfaces is laid flat batt insulation is cut to fit around the framing. Batt insulation is not allowed to be draped over the framing.
08	Attic access doors are insulated to the same R-value as the ceiling. The insulation is permanently attached using adhesive or mechanical fasteners.
09	Attic access must be surrounded with a dam at least the same depth as the insulation to prevent loss of ceiling insulation.
10	Batt insulation is cut to fit around cross bracings and truss webs in the attic.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****K. Raised Floor Insulation**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation is in full contact with subfloor.
02	Insulation hangers are spaced at 18 inches or less; insulation hangers must not compress insulation.
03	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
04	If the basement is conditioned, the walls adjacent to the crawlspace must meet minimum wall R-value requirements. This includes framed stem walls, and vertical concrete retaining walls.
05	If access to the crawl space is from the conditioned area, the raised floor must have an airtight insulated access hatch.

**L. Floor Above Garage Insulation**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation must be in full contact with the subfloor if the air barrier is at the band joist at the garage/house wall.
02	Insulation hangers spaced at 18 inches or less; insulation hangers must not compress insulation.
03	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
04	If the air barrier is at the perimeter of the garage, below the conditioned subfloor, the insulation is placed on the garage ceiling. The perimeter of the subfloor is also insulated.

**M. Cantilevered Floor Insulation**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation is in full contact with the cantilevered subfloor. Insulation hangers are spaced at 18 inches or less; insulation hangers do not compress insulation.
02	If netting or mesh is used, the cavity under the floor is filled and in contact with the subfloor.
03	Sealed blocking is installed between joists where a wall rim joist would be located in the absence of a cantilever. Insulation is placed on both sides of this block.

**N. Attached Porch Roof Insulation**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	The exterior insulated wall at the intersection with the porch roof is fully insulated above, below, and behind the roof line.
02	Where truss framing is used, airtight blocking is installed at the top and bottom of each wall/roof section and insulated.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ECC Certification Identification (If applicable):
City/State/Zip:	Phone:

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

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ENV-03-E
Insulation Installation	(Page 1 of 2)

## CF2R-ENV-03-E User Instructions

### A. Roof/Ceiling Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Roof) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Assembly/Framing Material: Wood, Metal, SIP OSB, SIP I-Joist, SIP Single 2x, SIP Double 2x, see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C.).
6. Insulation Type: Using the drop down menu, select the type of insulation being installed (e.g., cellulose, fiberglass, SPF, etc.).
7. Ceiling Insulation R-value: Indicate the ceiling insulation R-value.
8. Insulation Depth: Indicate, in inches, the amount of insulation installed.
9. Continuous Insulation Above the Roof Deck R-value: Indicate the R-value of continuous insulation, having no framing penetration, installed above the roof deck.
10. Insulation Below the Roof Deck R-value: Indicate the R-value of insulation installed below the roof deck.

### B. Wall Insulation

1. I.D.: A label from the plans, (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Assembly/Framing Material: Wood, Metal, SIP OSB, SIP I-Joist, SIP Single 2x, SIP Double 2x, see JA4 for guidance.
4. Thickness: Thickness in inches.
5. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C.).
6. Insulation Type: Using the drop down menu, select the type of insulation being installed (e.g., cellulose, fiberglass, SPF, etc.).
7. Core/Cavity Insulation R-value: Indicate the cavity insulation R-value.
8. Insulation Depth: Indicate, in inches, the amount of insulation installed.
9. Continuous Exterior Insulation R-value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the exterior.
10. Continuous Interior Insulation R-value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the interior

### C. Masonry/Mass Insulation

1. I.D.: A label from the plans (e.g., A1.4 or Wall1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Walls Above Grade: Using the down menu, select “Yes” if the mass wall is above grade.
4. Mass Thickness: Indicate the thickness of the mass, in inches, the insulation is applied to.
5. Exterior Furring Strip Type/Depth: Indicate the type and thickness of furring material installed, such as wood/1.0 inch thick.
6. Interior Furring Strip Type/Depth: Indicate the type and thickness of furring material installed, such as wood/1.0 inch thick.
7. Insulation Type: Using the down menu, select the type of insulation being installed (e.g., cellulose, fiberglass, SPF, etc.).



CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ENV-03-E
Insulation Installation	(Page 2 of 2)

8. Exterior Insulation R-Value: Indicate the R-value of the insulation installed on the outside of the assembly.
9. Interior Insulation R-Value: Indicate the R-value of the insulation installed on the inside of the assembly.

#### **D. Raised Floor Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Floor1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Framing Material: Wood or Metal.
4. Framing Size & Spacing: Indicate the framing size and spacing (e.g., 2x4 @ 16 in O.C.).
5. Insulation Type: Using the drop down menu, select the type of insulation being installed (e.g., cellulose, fiberglass, SPF, etc.)
6. Cavity Insulation R-value: Indicate the cavity insulation R-value.
7. Insulation Depth: Indicate, in inches, the amount of insulation installed.
8. Exterior Floor R-Value: Indicate the R-value of continuous insulation, having no framing penetration, installed on the outside of the floor.
9. Concrete Fill: Indicate if the floor has a concrete fill; yes/no.

#### **E. Slab Floor/Perimeter Insulation**

1. I.D.: A label from the plans (e.g., A1.4 or Slab Floor1) documenting the location of the installed insulation.
2. Manufacturer and Brand: Indicate the manufacturer and brand of the product being installed.
3. Floor Type: Indicate the type of floor type the insulation is being applied to; such as Heated Slab or Slab on Grade.
4. Insulation Type: Using the drop down menu, select the type of insulation being installed (e.g., cellulose, fiberglass, SPF, etc.).
5. Insulation Depth: Indicate, in inches, the depth of insulation installed. Refer to F02 for additional information.
6. Insulation R-Value: Indicate the insulation R-value being installed vertically and horizontal horizontally (if applicable).
7. Vertical Insulation Length: Indicate, in inches, the length of the insulation being installed. Refer to F03 for additional information on installing both vertical and horizontal slab insulation
8. Horizontal Insulation Length: Indicate, in feet, the length of the insulation installed from the outside edge of the vertical insulation to the center of the slab.

#### **Documentation Declaration Statements**

1. The person who prepared the CF3R 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 (if applicable) for their company, responsible builder or installer name, CSLB license number, sample group number, dwelling test status in sample group, ECC Rater company name, ECC Rater name, ECC Rater signature, ECC Rater certification number and date signed.





# ROOFING-VENTILATION-RADIANT BARRIER

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-04-E

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

## CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

### A. General Information

Note: In order to comply with the 1/300 exception, a Class I or II vapor retarder is required to be installed in climate zones 14 and 16.

01	Construction Type	
02	Total Attic Area (ft <sup>2</sup> )	
03	Radiant Barrier Installed?	
04	Attic Space Ventilated or Unventilated?	
05	Minimum Ventilation Method of Compliance	

### B. Radiant Barrier

01	Brand Name and Product Number	
02	Installation Type	

### C. Schedule of Lower Vents

The Net Free Area (NFA) of a manufactured product is stated on the packaging or on the manufacturer's specification data sheet. For non-manufactured products, assume that the net free area is one third of the total aperture area.

01	02	03	04
Type of Vent	NFA Per Vent (in <sup>2</sup> )	Number of Vents Installed	Total NFA Per Vent Type (in <sup>2</sup> )

### D. Schedule of Upper Vents

The Net Free Area of a manufactured product is stated on the packaging or on the manufacturer's specification data sheet. For non-manufactured products, assume that the net free area is one third of the total aperture area.

01	02	03	04
Type of Vent	NFA Per Vent (in <sup>2</sup> )/Per Liner Foot (ft)	Number of Vents/Linear Feet Installed	Total NFA Per Vent Type (in <sup>2</sup> )

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

**E. Required Vent Area**

01	Combined NFA of Installed Upper and Lower Vents (in <sup>2</sup> )	
02	Minimum Required Combined NFA of Upper and Lower Vents (in <sup>2</sup> )	
03	NFA of Installed Upper Vents (in <sup>2</sup> )	
04	Minimum Required NFA of Upper Vents (in <sup>2</sup> )	
05	Compliance Statement:	

**F. Radiant Barrier – Additional Requirements**

Radiant Barrier		
01	Radiant barrier must be installed on all vertical surfaces in the attic including gable ends.	
02	The emittance of the radiant barrier shall be less than or equal to 0.05 as tested with ASTM C1371, or E408.	
03	The product shall meet all requirements for California certified insulation materials [radiant barriers] of the Department of Consumer Affairs, Bureau of Household Goods and Services, as specified by California Referenced Standards Code ( <b>California Code of Regulations (CCR)</b> ), Title 24, Part 12, Chapter 12-13, Standards for Insulating Material	
04	When determining the Total Attic Area, the area over unconditioned spaces such as the garage is included when the attic spaces are connected.	

**G. Attic Ventilation – Additional Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Lower Vents	
01	Lower vents are within one foot (1-ft) of the eave.
Upper Vents	
02	Upper vents are within three feet (3-ft) of the ridge.
Vent Area	
03	The NFA of upper vents must be within required NFA range of upper vents Note: per Exception to R806.2 of the California Building Code (CBC) Title 24, Part 2, Vol. 2.5, if the net free ventilating area is less than 1:150, then the upper ventilation must be at least 40% and no more than 50%. Part 2 contains additional requirements that must be met if the area is less than 1:150.

**H. Roofing Products (Cool Roof) Installation Information**

01	02	03	04	05	06	07	08	09	10	11	12
Tag / ID	Roof Pitch	Cool Roof Rating Council (CRRC) Product ID Number	Product Type	Cool Roof Rating Council (CRRC) Listed Aged Solar Reflectance	Installed				Required		
					Initial Solar Reflectance	Aged Solar Reflectance	Thermal Emittance	SRI	Aged Solar Reflectance	Thermal Emittance	SRI



## ROOFING-VENTILATION-RADIANT BARRIER

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-04-E

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### I. Roofing Products (Cool Roof) – Additional Requirements

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Any roof area covered by building integrated photovoltaic panels and solar thermal panels are exempt from the above Cool Roof requirements.
02	Liquid field applied coatings must comply with installation criteria from section 110.8(i)4.
03	Mass roof 25 pounds per square foot (lb/ft <sup>2</sup> ) or greater: Mass roofs are not required to have a cool roof even if the climate zone specifies minimum performance requirements.

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/ECC Certification Identification (If applicable):
City/State/Zip:	Phone:

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

## CF2R-ENV-04-E User Instructions

### A. General Information

1. Construction Type: Using the drop down menu, select the roofing construction type (e.g., cathedral ceiling or attic).
2. Total Attic Area (ft<sup>2</sup>): Enter the total attic area over conditioned space in square feet (ft<sup>2</sup>). Include areas over unconditioned space when the attic spaces are not separated by a continuous air barrier.
3. Radiant Barrier Installed?: Using the drop down menu, select “Yes” if a radiant barrier is being installed.
4. Attic Space Ventilated or Unventilated?: Using the drop down menu, indicate whether the attic space is ventilated or unventilated.
5. Minimum Ventilation Method of Compliance: Using the drop down menu, indicate the method of compliance used to meet the minimum ventilation requirements (e.g., 1/150 or 1/300).

Note: In order to comply with the 1/300 exception, a Class I or II vapor retarder is required to be installed in climate zones 14 and 16.

### B. Radiant Barrier

1. Brand Name and Product Number: Enter the brand name and product number of the product used.
2. Installation Type: Using the drop down menu, indicate the installation type from the following list:
  - i. Attached to underside of roof deck;
  - ii. Attached to bottom of truss/rafters;
  - iii. Attached between truss/rafters;
  - iv. Draped over top of truss/rafters;
  - v. Attached to underside of roof deck with air space; or
  - vi. Attached to underside of roof deck with baffle.

One of these six installation methods must be used; no other methods are allowed.

### C. Schedule of Lower Vents

In Table C, list all the lower vents that are installed in the attic(s). Lower vents are within one foot (1-ft) of the eave.

For each type of vent, indicate:

1. Type of Vent: For example, eyebrow vent, eave vent, or round vent.
2. NFA per Vent/per Linear Foot: Net free area (NFA) of each individual vent (in<sup>2</sup>) or net free area (NFA) per linear foot. The net free area (NFA) of a manufactured product is stated on the packaging or on the manufacturer’s specification data sheet. For non-manufactured products, assume that the net free area is one third of the total aperture area.
3. Number of Vents/Linear Feet Installed: Indicate how many vents, or how many linear feet of this type are installed in the attic(s).
4. Total NFA Per Vent Type: Calculated value; not a user input.

### D. Schedule of Upper Vents

In table D., list all the installed upper vents in the same way as was done for lower vents (see Section C. above). Upper vents are within three feet (3-ft) of the ridge.

1. Type of Vent: For example, eyebrow vent, eave vent, round vent, or ridge vent.
2. NFA per Vent/per Linear Foot: Net free area (NFA) of each individual vent (in<sup>2</sup>) or net free area (NFA) per linear foot. The net free area (NFA) of a manufactured product is stated on the packaging

or on the manufacturer’s specification data sheet. For non-manufactured products, assume that the net free area is one third of the total aperture area.

3. Number of Vents/Linear Feet Installed: Indicate how many vents, or how many linear feet of this type are installed in the attic(s).
4. Total NFA Per Vent Type: Calculated value; not a user input.

### E. Required Vent Area

Table E. sets out the minimum required net free area (NFA) of total vents (upper plus lower), and the required NFA of upper vents. All values are calculated based on the inputs in Tables B, C, and D.

A minimum ratio between upper vents and lower vents must be achieved—the exception to R806.2 of the California Building Code (CBC) Title 24, Part2, Vol.2.5, states if the net free ventilating area is less than 1:150, then the upper ventilation must be at least 40% and no more than 50%. Part 2 contains additional requirements that must be met if the area is less than 1:150.

### F. Radiant Barrier – Additional Requirements

Table F. lists additional requirements for Radiant Barriers.

### G. Attic Ventilation – Additional Requirements

Table G. lists additional requirements for Lower Vents, Upper Vents, and Vent Area.

### H. Roofing Products (Cool Roof) Installation Information

1. Tag/ID: A label (if any) from the plans, such as R1.
2. Roof Pitch: Indicate whether the roof pitch is  $<2:12$  or  $\geq 2:12$ .
3. Cool Roof Rating Council (CRRC) Product ID Number: If a cool roof is installed, obtain the Product ID Number from the Cool Roof Rating Council’s (CRRC) product packaging label or rated products directory (<https://coolroofs.org/directory/roof>).
4. Product Type: Using the drop down menu, indicate the product type being used (e.g., asphalt shingles, clay tiles, etc.).
5. Cool Roof Rating Council (CRRC) Listed Aged Solar Reflectance: State whether the 3-year Aged Solar Reflectance value of the product used is listed on the CRRC product packaging label or rated products directory—Yes or No.
6. Installed Initial Solar Reflectance: Enter the Initial Solar Reflectance value of the product used; obtained from the CRRC product packaging label or rated products directory.
7. Installed Aged Solar Reflectance: Enter the Aged Solar Reflectance value of the product used; obtained from the Cool Roof Rating Council (CRRC) product packaging label or label or rated product directory.

NOTE: If the 3-year aged value is not available then use the equation in Section 110.8(i)2 of the Energy Standards to calculate the 3-year Aged Solar Reflectance. One can also use the “Calculated

Aged Solar Reflectance” from the Solar Reflectance Index (SRI) Calculation Worksheet” available on the California Energy Commission’s website.

8. Installed Thermal Emittance: Enter the Thermal Emittance value of the product used; obtained from the CRRC product packaging label or rated products directory. This can be either the initial or aged value.
9. Installed SRI: If applicable, obtain the value of the product used from the CRRC rated products directory, or the “Solar Reflectance Index (SRI) Calculation Worksheet” available at the [California Energy Commission’s website](#).
10. Proposed Aged Solar Reflectance: Report the Proposed Aged Solar Reflectance value from the CF1R.
11. Proposed Thermal Emittance: Report the Proposed Thermal Emittance value from the CF1R.
12. Proposed SRI: Report the Proposed SRI value if applicable, from the CF1R-NCB, -ADD, or -ALT-01.

#### **I. Roofing Products (Cool Roof) – Additional Requirements**

This section contains additional requirements for Roofing Products. Other exceptions apply for additions and/or alterations.

#### **Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**BUILDING AIR LEAKAGE DIAGNOSTIC TEST**  
**BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Enclosure Air Leakage – General Information**

01	Test Procedure used	
02	Date of the Diagnostic Test for this Dwelling	
03	Is ECC verification of building enclosure air leakage to outside required by CF1R?	
04	Target Enclosure Air Leakage from CF1R (CFM50)	
05	Indoor temperature during test (degrees Fahrenheit (°F))	
06	Outdoor temperature during test (degrees Fahrenheit (°F))	
07	Blower Door Location	
08	Building Elevation Above Sea Level (feet (ft))	

**B. Diagnostic Equipment Information**

01	Number of Manometers Used to Measure Home Pressurization			
02	03	04	05	06
Manometer Make	Manometer Model	Manometer Serial Number	Manometer Calibration Date	Manometer Calibration Status
07	Number of Fans Used to Pressurize Home			
08	09	10	11	
Fan Make	Fan Model	Fan Serial Number	Fan Configuration (rings)	

**C1. Enclosure Air Leakage Diagnostic Test for a Single-Point Test with Manual Meter**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure Difference (Pa) Goal = $50 \pm 3$ or $-50 \pm 3$ (Pressurization is positive; Depressurization is negative)	
07	Induced Enclosure Pressure Check	
08	Measured Nominal Fan Flow at Above Fan Pressure (cfm) at the Induced Enclosure Pressure Difference (in C06 above)	
09	Calculated Nominal CFM50	

Registration Number: CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

Registration Date/Time:

ECC Provider:

January 1, 2026



**BUILDING AIR LEAKAGE DIAGNOSTIC TEST  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**C2. Enclosure Air Leakage Diagnostic Test for a Single-Point Test with Automatic Meter**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Induced Enclosure Pressure from Manometer (Pa) Goal = $50 \pm 3$ or $-50 \pm 3$ (Pressurization is positive; Depressurization is negative)	
05	Induced Enclosure Pressure Check	
06	Nominal CFM50	

**C3. Enclosure Air Leakage Diagnostic Test for a Multi-Point Test**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure Difference (Pa) Goal = $60 \pm 3$ or $-60 \pm 3$ (Pressurization is positive; Depressurization is negative)	
07	A minimum of five readings were taken spaced evenly between 10 Pa and 60 Pa (or highest attainable pressure)	
08	Post-Test Baseline Enclosure Pressure (Pa)	
09	Name and Version of ASTM E779 Compliant Software used for Multi-Point Test	
10	Corrected CFM50 (from software)	

**D1. Altitude and Temperature Correction for Single-Point Test Data**

01	Altitude and Temperature Correction Factor	
02	Corrected CFM50	

**D2. Altitude and Temperature Correction for Multi-Point Test Data**

**Performed by blower door software.**

01	
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**E1. Accuracy Adjustment for Single-Point Test Data**

01	Adjusted CFM50 (measured air leakage rate)	
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**E2. Accuracy Adjustment for Multi-Point Test Data**

01	Percent Uncertainty @ 95% Confidence Level (from software)	
02	Accuracy Level	
03	Accuracy Adjustment Factor	
04	Adjusted CFM50 (measured air leakage rate)	

**F. Compliance Statement**

01	
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Registration Number: \_\_\_\_\_  
CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

Registration Date/Time: \_\_\_\_\_

ECC Provider: \_\_\_\_\_  
January 1, 2026

**BUILDING AIR LEAKAGE DIAGNOSTIC TEST  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**G. Additional Requirements for Compliance**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The procedure for preparing the enclosure for testing is detailed in RESNET 380-2019 Section 4.2.
02	The procedure for installation of the test apparatus, and preparations for measurement shall conform to RESNET 380-2019 Section 4.3
03	The procedure for the conduct of the enclosure air leakage test shall conform to the One-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.1.
04	The procedure for the conduct of the enclosure air leakage test shall conform to the Multi-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.2.

FOR INFORMATION AND DATA COLLECTION  
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**BUILDING AIR LEAKAGE DIAGNOSTIC TEST  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-ENV-20-H
Building Air Leakage Diagnostic Test – Building Enclosures and Dwelling Unit Enclosures	(Page 1 of 4)

## CF2R-ENV-20-H User Instructions

### Section A. Enclosure Air Leakage – General Information

1. Select the appropriate test procedure. This selection will determine which sections of this document are required. Not that newer manometers have automatic functions for compensating baseline (automatic baseline) and compensating for house pressures other than the target. It is preferable to use these when available.
2. Enter the date that the enclosure air leakage test data was collected.
3. This field is automatically filled from the CF1R which determines if a CFM50 compliance target value is required.
4. This field determines the CFM50 target enclosure air leakage from the CF1R if ECC verification of enclosure air leakage is required.
5. Enter the indoor temperature measured at the time that the enclosure air leakage test was performed.
6. Enter the outdoor temperature measured at the time that the enclosure air leakage test was performed.
7. Provide a brief description of the location where the blower door was installed for the test. Examples: “front entry door on west side of house”, “door between house and garage”, “large window in family room”.
8. Enter the building elevation above sea level. Use the value for the closest city found in Reference Appendices, Joint Appendix JA2.2.

### Section B. Diagnostic Equipment Information

1. Enter the number of manometers used to measure the enclosure pressurization. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
2. Enter the make (brand) of the manometer used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
3. Enter the model of the manometer used to collect the enclosure air leakage data. Examples: DM-2 Mark II, DG700.
4. Enter the serial number of the manometer used to collect the enclosure air leakage data.
5. Enter the most recent date that the manometer was calibrated by following manufacturer’s calibration specifications.
6. This field is automatically filled. If the calibration date was more than 12 months prior to the test date entered in Row A02 above, an error will appear.
7. Enter the number of blower door fan systems required to run simultaneously to pressurize the enclosure for the enclosure air leakage test. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
8. Enter the make (brand) of the fan used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
9. Enter the model of the fan used to collect the enclosure air leakage data. Examples: US1000, Q46, BD3, BD4.
10. Enter the serial number of the fan used to collect the enclosure air leakage data.
11. Enter the fan configuration shown on the meter. This is sometimes referred to as “range configuration”, “CONFIG” or “rings”. Examples: Open, A, B, C8.

**Section C1. Enclosure Air Leakage Test for a Single-Point Test with Manual Meter**

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure measured. This value is read from the manual manometer during the test.
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $50 \pm 3$  Pa.
7. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
8. Enter the measured nominal fan flow at above fan pressure from the manometer that corresponds to the induced enclosure pressure difference.
9. This field is automatically calculated. The induced enclosure pressure difference is converted to a nominal airflow at 50 Pa.

**Section C2. Enclosure Air Leakage Test for a Single-Point Test with Automatic Meter**

1. Enter the time average period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the automatic manometer with no fans turned on.
4. Enter the induced enclosure pressure from the automatic manometer. The goal is to achieve  $50 \pm 3$  Pa.
5. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
6. Enter the measured nominal CFM50 from the automatic manometer.

**Section C3. Enclosure Air Leakage Test for a Multi-Point Test**

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure measured. This value is read from the manual manometer during the test.
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $60 \pm 3$  Pa.
7. When using the software for a multi-point test, a minimum of five measures must be taken over a range of pressures. This is where the user acknowledges that this was done.
8. Enter the Post Test Baseline Enclosure Pressure from the manometer.

9. This version of the ENV-20 requires use of an ASTM E779-19 compliant software, typically provided by the blower door manufacturer. Confirm with the software vendor that it is compliant. Enter the name and version here.
10. Enter the final Corrected CFM50 reading from the software.

**Section D1. Altitude and Temperature Correction for Single-Point Test Data**

1. This field is automatically calculated. This factor is determined based on the altitude and temperature of the building location using equation 4 in Section 9 of ASTM E779-19.
2. This field is automatically calculated. The corrected CFM50 is the nominal CFM50 from Section C multiplied by the altitude and temperature correction factor.

**Section D2. Altitude and Temperature Correction for Multi-Point Test Data**

Performed by blower door software.

**Section E1. Accuracy Adjustment for Single-Point Test Data**

1. This field is automatically calculated. This value is determined from Equation 5a from ANSI/RESNET/ICC 380-2019.

**Section E2. Accuracy Adjustment for Multi-Point Test Data**

1. The software will provide a “Percent Uncertainty” value based on the readings taken. Enter that value here
2. This field is automatically calculated. If the Percent Uncertainty level is 10% or less, the Accuracy Level is “Standard”. If the Percent Uncertainty level is greater than 10%, the Accuracy Level is “Reduced”.
3. This field is automatically calculated:
  - a. If the Accuracy Level is “Standard”, the Accuracy Adjustment Factor will be 1 (no adjustment)
  - b. If the Accuracy Level is “Reduced”, the Accuracy Adjustment Factor will be adjusted by the Percent Uncertainty.
4. This field is automatically calculated. The Adjusted CFM50 is the Corrected CFM50 multiplied by the Accuracy Adjustment Factor.

**Section F. Compliance Statement**

1. This field is automatically calculated. A check is performed to make sure that the meter has been properly calibrated and that the measured enclosure air leakage is less than the target enclosure air leakage.

**Section G. Additional Requirements for Compliance**

1. This statement must be true (or not applicable) for the test to conform to the protocols.
2. This statement must be true (or not applicable) for the test to conform to the protocols.
3. This statement must be true (or not applicable) for the test to conform to the protocols.
4. This statement must be true (or not applicable) for the test to conform to the protocols.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

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## QII - AIR INFILTRATION SEALING – FRAMING STAGE

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-21-H

### SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

#### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

#### A. Air Barrier Materials

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Note:

SPF insulation is an acceptable air barrier and sealant when installed to a minimum thickness of 2 inches for closed cell and 5.5 inches for open cell, except where not allowed by manufacturer (e.g., flues, vents, can lights, etc.).

01	A continuous sealed exterior air barrier is required in all thermal envelope assemblies to limit air movement between unconditioned/outside spaces and conditioned/inside spaces, and must comply using one of the following methods: <ol style="list-style-type: none"><li>Using individual materials that have an air permeance not exceeding 0.004 cfm/ft<sup>2</sup> under a pressure differential of 0.3 in. w.g. (1.57 pcf) (0.02 L/s.m<sup>2</sup> at 75 pa) when tested in accordance with ASTM E2178; or</li><li>Using assemblies of materials and components that have an average air leakage not to exceed 0.04 cfm/ft<sup>2</sup> under a pressure differential of 0.3 in. w.g. (1.57 pcf) (0.2 L/s.m<sup>2</sup> at 75 pa) when tested in accordance with ASTM E2357, ASTM E1677, ASTM E1680, or ASTM E283; or</li><li>Testing the complete building and demonstrating that the air leakage rate of the building envelope does not exceed 0.40 cfm/ft<sup>2</sup> at a pressure differential of 0.3 in. w.g. (1.57 pcf) (2.0 L/s.m<sup>2</sup> at 75 pa) in accordance with ASTM E779 or an equivalent approved method.</li></ol>	
02	Method of Compliance	

#### B. Raised Floor Adjacent to Unconditioned Space or Separate Dwelling Units

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	All gaps in the raised floor are sealed.
02	All chases are sealed at floor level using a sealed hard cover.
03	All holes (e.g., for plumbing and electrical wires) that penetrate the floor or bottom plates of walls are sealed.
04	Subfloor sheathing is glued or sealed at all panel edges to create a continuous airtight subfloor air barrier.

#### C. Walls Adjacent to Unconditioned Space

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	All penetrations through the exterior wall air barrier are sealed to provide an airtight envelope to unconditioned spaces such as the outdoors, attic, garage, and crawlspace.
02	Exterior wall air barrier is sealed to the top plate and bottom plate in each stud bay.
03	All electrical boxes, including knockouts, that penetrate the air barrier to unconditioned space are sealed.
04	All openings in the top and bottom plate, including all interior and exterior walls, to unconditioned space are sealed; such as holes drilled for electrical and plumbing.
05	Exterior bottom plates (all stories) are sealed to the floor.
06	All gaps around windows and doors are sealed. The sealant used follows manufacturer specifications.
07	Rim joist gaps and openings are fully sealed.
08	Fan exhaust duct outlet/damper at the exterior wall are sealed.
09	Knee walls have solid and sealed blocking at the bottom, top, left, and right sides to prevent air movement into insulation.





## QII - AIR INFILTRATION SEALING – FRAMING STAGE

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-21-H

### SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

#### D. Ceiling Air Barrier Adjacent to Unconditioned Space

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	There is a continuous air barrier at the ceiling level. All openings into walls, drops, chases or double walls are sealed.
02	All penetrations through the top plate of interior and exterior walls are sealed.
03	Fire sprinklers penetrating a ceiling air barrier shall be sealed to prevent air movement according to the manufacturer's instructions.
04	All fixtures cut into ceiling air barrier (e.g., HVAC registers, electrical boxes, fire alarm boxes, exhaust fan housing, and recessed lighting fixtures) are sealed to the surrounding dry wall. If it is not possible to seal the fixture directly, a secondary air barrier shall be created around the fixture.
05	All installed recessed lighting fixtures that penetrate the ceiling to unconditioned space are rated to be Insulation Contact and Airtight (IC and AT) which allows direct contact with insulation.
06	All dropped ceiling areas are covered with hard covers that are sealed to the framing, or else the bottom and sides of dropped ceiling areas are all insulated and sealed as ceilings and walls as required on the Certificate of Compliance.
07	All vertical chases (e.g., HVAC ducts and plumbing) and soffits are sealed at the ceiling level.
08	Chimneys and flues require sheet metal flashing at the ceiling level. The flashing shall be sealed to the chimney/flue with fire rated caulk. The flashing shall be sealed to the surrounding framing.
09	Framing locations where air may move down into the walls from the attic (e.g., double walls, pocket doors, architectural bump-outs, etc.) have a sealed hard cover to prevent air movement.
10	Attic access forms an airtight seal between the conditioned space and unconditioned space. Vertical attic access requires mechanical compression using screws or latches.

#### E. Roof Air Barrier – Unvented Attics Adjacent to Unconditioned Space

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	There is a continuous air barrier at the roof deck and gable ends.
02	Chimneys and flues require sheet metal flashing at the roof deck. The flashing is sealed to the chimney/flue with fire rated caulk. The flashing is sealed to the surrounding framing.
03	All penetrations in the roof deck and gable ends for plumbing, electrical, etc. are sealed.

#### F. Conditioned Space Above or Adjacent to Garage Air Barrier

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	All penetrations in the subfloor above the garage into conditioned space must follow the raised floor air barrier requirements.
02	Infiltration between the space above the garage and the subfloor is prevented by one of the following methods: <ul style="list-style-type: none"><li>Seal all edges of the garage ceiling (typically drywall) at the perimeter of the garage to create a continuous airtight surface between the garage and adjacent conditioned envelope. Seal all plumbing, electrical, and mechanical penetrations between the garage and adjacent conditioned space. For an open-web truss, airtight blocking is added on all four sides of the garage perimeter. Insulation can be placed on the garage ceiling.</li><li>Seal the band joist above the wall at the garage to conditioned space transition. Seal all subfloor seams and penetrations between the garage and adjacent conditioned space. Insulation must be placed in contact with the subfloor below the conditioned space.</li></ul>

#### G. Cantilevered Floor Air Barrier

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Airtight blocking is installed between joists where the wall rim joist would have been located in the absence of a cantilever.
02	Exterior sheathing is installed to the bottom of the cantilever so that there is a continuous air and weather barrier for the cantilever. The cantilevered joist must be insulated to the same R-value as would be required for the subfloor prior to closing.
03	Any gaps, cracks, or penetrations in the air barrier of the cantilever are sealed. Recessed can lights in the cantilever are rated to be Insulation Contact and Airtight (IC and AT) and properly sealed to the sheathing.



## QII - AIR INFILTRATION SEALING – FRAMING STAGE

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-ENV-21-H

### **SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

#### **H. Walls for Attached Porch, Attic, Double Wall Air Barrier**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	An exterior wall air barrier is required at the intersection of the porch and exterior wall when there is conditioned space on the other side. The exterior wall includes an air barrier where the attic attaches to the conditioned space.
02	Truss framing blocking is used at the top and bottom of each wall/roof section.

#### **I. Special Requirements for SIPs**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	SIPs are considered an air barrier when properly sealed at top, bottom, sides, and all penetrations.
02	Air barrier is continuous across all surfaces, including between SIPs and non-SIP sections.

#### **J. Special Requirements for ICF**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	ICF sections are considered an air barrier when properly sealed at top, bottom, sides, and all penetrations.
02	Air barrier is continuous across all surfaces, including between ICF and non-ICF sections.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a ECC rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

**CF2R-ENV-21 User Instructions**

Quality Insulation Installation (QII) applies to the entire building (roof/ceiling, walls, and floor) for new construction and requires field verification by a third-party ECC Rater. For Alterations to existing buildings, compliance credit can only be taken when the “existing, plus addition, plus alteration” approach is used, but credit will only apply to the new surfaces in the new zone.

**A. Air Barrier Materials**

2. Using the drop down menu, indicate which method is being used to comply with the continuous air barrier requirements [e.g., Method 1 (Individual Materials), Method 2 (Assemblies of Materials), Method 3 (Complete Building)].

**B. Raised Floor Adjacent to Unconditioned Space or Separate Dwelling Unit**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**C. Walls Adjacent to Unconditioned Space**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**D. Ceiling Air Barrier Adjacent to Unconditioned Space**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**E. Roof Air Barrier – Unvented Attics Adjacent to Unconditioned Space**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**F. Conditioned Space Above or Adjacent to Garage Air Barrier**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**G. Cantilevered Floor Air Barrier**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**H. Walls for Attached Porch, Attic, Double Wall Air Barrier**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**I. Special Requirements for SIPs**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**J. Special Requirements for ICF**

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Insulation Materials Installed**

01	Roof Deck Insulation Material Installed	
02	Ceiling Insulation Material Installed	
03	Exterior Wall Insulation Material Installed	
04	Raised Floor Insulation Material Installed	
05	Slab Edge Insulation Material Installed	

**B. All Surfaces**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Air barrier installation and preparation for insulation was done and verified prior to insulation being installed.
02	All surfaces between conditioned and unconditioned space are sealed and insulated to meet or exceed the levels specified on the Certificate of Compliance.
03	All structural framing areas shall be insulated in a manner that resists thermal bridging through the assembly separating conditioned from unconditioned space. Structural bracing, tie-downs, and framing of steel, or specialized framing used to meet structural requirements of the California Building Code (CBC) are allowed and must be insulated. These areas shall be called out on the building plans with diagrams and/or specified design drawings indicating the R-value of insulation and fastening method to be used.
04	All insulation was installed according to the manufacturer's installation instructions.
05	Labels or specification/data sheets for each insulation material shall be provided to the ECC rater. Loose-fill material includes insulation material bag labels or coverage charts.
06	Loose-fill insulation – The installed depth and density of insulation is verified in at least 6 random locations to ensure that the minimum thickness and installed density meet the R-value specified on the Certificate of Compliance and are consistent with the manufacturer's coverage chart.
07	If kraft paper faced insulation is used, paper is installed on the conditioned (warm in winter) side of surface. Paper must be in contact with air barrier to within 2-inches of the framing (stud, joists, etc.).

**C. Raised Floor Adjacent to Unconditioned Space**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Insulation is in full contact with the subfloor.
02	Insulation hangers are spaced at 18 inches or less. Insulation hangers do not compress insulation.
03	Netting, or mesh, can be used if the cavity under the floor is filled and in contact with the subfloor.
04	When daylit basements are adjacent to crawlspaces, if the basement is conditioned the walls adjacent to the crawlspace are insulated to the R-value listed on the Certificate of Compliance. This includes framed stem walls, and vertical concrete retaining walls.
05	If access to the crawlspace is from the conditioned area the raised floor includes an airtight insulated access hatch. Where possible locate crawl space access on the exterior.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Wall Adjacent to Unconditioned Space**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Insulation quality was verified prior to the installation of the interior air barrier (typically gypsum board).
02	Loose-fill and batt insulation is in contact with all six sides of wall cavities (top, bottom, back, left, right, front [to be installed later]) with no gaps, voids, or compression. Special Situation: Where framing depth is greater than required insulation thickness (e.g., double walls or framed bump-outs) a secondary air barrier shall be installed and in contact with the insulation, so that the insulation fills the cavity formed by the additional air barrier.
03	Insulation fits snugly around obstructions (e.g., electrical boxes, plumbing and wiring) with no gaps, voids, or compression.
04	Structural metal tie-downs and shear panels are insulated between exterior air barrier and metal.
05	Hard to access wall stud cavities, such as corner channels or wall intersections, are insulated to the proper R-value prior to the installation of exterior sheathing or exterior stucco lathe.
06	Insulation and interior air barrier are installed behind tub, shower, fireplace enclosures and stairwells to the R-value listed on the Certificate of Compliance when located against exterior walls.
07	All single-member window and door headers shall be insulated to a minimum of R-3 for a 2x4 framing, or equivalent width, and a minimum of R-5 for all other assemblies. No header insulation is required for single-member headers that are the same width as the wall, provided that the entire wall has at least R-2 insulation.
08	After insulation is installed: All insulated walls have interior and exterior air barriers, including kneewalls and walls of skylight wells. Exception: Rim joists. Interior air barrier (typically gypsum board) is sealed to top plate.

**E. Ceiling Adjacent to Unconditioned Space**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Insulation extends to the outside surface of the exterior wall.
02	Insulation is in direct contact with the ceiling air barrier so there are no gaps, voids, or compression.
03	Chimneys and flues (except zero clearance) have a sheet metal collar at the ceiling level to prevent contact with the insulation. The collar is at least as tall as the depth of the insulation. There is a minimum 1-inch clearance between the collar and the chimney/flue for double wall vent, and 6-inches for single wall vent, unless manufacturer's instructions require otherwise. The collar is sealed to the ceiling with high temperature sealant to prevent air leakage. The insulation is in contact with the sheet metal collar.
04	Recessed can lights penetrating the ceiling air barrier are covered with insulation to the depth needed to meet the ceiling R-value specified on the Certificate of Compliance.
05	External surfaces of steel studs, steel-framed kneewalls, skylight shafts, and gable ends are covered with insulation.

**F. Ceiling Insulation in Vented Attics**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Required eave ventilation shall not be obstructed. The net-free ventilation area of the eave vent is maintained.
02	Eave vent baffles and dams are installed to prevent air movement under or into the ceiling insulation.
03	Attic access is insulated to the same R-value required by the Certificate of Compliance for ceiling insulation and the insulation is permanently attached using adhesive or mechanical fasteners.
04	Attic access must have a dam around the access to at least the same depth as the insulation.
05	Attic rulers specified to the installed loose-fill material (brand and type) are installed and evenly distributed throughout the attic to verify depth (one ruler for every 250 square feet (ft <sup>2</sup> )). The rulers are clearly readable and scaled to read inches of insulation and the R-value installed.

**G. Insulation in Unvented Attics**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The roof sheathing is the air barrier and is sealed to prevent air movement to the outside.
02	Insulation is in full contact with the air barrier (roof sheathing).
03	If insulated using air permeable insulation, gable end walls are sealed and insulated the same as exterior walls, including interior air barrier.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Insulation in Vented Attics (High Performance Vented Attics)**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation is in full contact with roof sheathing and firmly supported to prevent sagging.
02	Batt insulation between roof trusses is acceptable with minimal gaps and voids caused by roof truss members.
03	Insulation is not required on gable end walls.
04	Required roof deck insulation over any conditioned space, or HVAC ducts, is installed on the entire attic roof deck; even over unconditioned spaces (e.g., garage, covered porch). Roof deck of attic over unconditioned space without HVAC ducts and separated from other attics by a sealed air barrier do not need to be insulated.

**I. Special Requirements for Skylight Shafts and Attic Knee Walls**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Insulation must meet all the requirements for walls and insulation is in contact with the air barrier on all six sides unless SPF is used.
02	Insulation shall be in full contact with the interior wall finish. Batt insulation must be cut to fit around 2x4's that are laid flat.
03	Skylight shafts and attic knee walls shall be completely enclosed by vertical and horizontal framing, including horizontal plates at the top and bottom of the insulation.

**J. Special Requirements for Floors Above Garages**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	If the air barrier is at the perimeter of the garage below the conditioned subfloor, then the insulation may be placed on the garage ceiling. The perimeter of the subfloor must also be insulated.
----	---

**K. Special Requirements for Cantilevered Floors**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Sealed blocking shall be installed between joists where the wall rim joist would have been located in the absence of a cantilever. Insulation shall be placed on both sides of the block.
----	---

**L. Special Requirements for Attached Porches**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Exterior wall at the intersection of the porch roof is fully insulated above, below and behind the roof line.
02	Where truss framing is used, airtight blocking is used at the top and bottom of each wall/roof section and is insulated.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****M. Special Requirements for SPF Insulation**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Installed product meets the claimed R-value per inch. The total R-value may be calculated based on the thickness of insulation multiplied by the "tested R-value per inch" as certified by the Department of Consumer Affairs, Bureau of Household Goods and Services.
02	Installed thickness meets the required R-value from the Certificate of Compliance. Verified in at least 6 random places for each surface type: floors, walls, and ceilings.
03	Insulation is spray applied to fully adhere to structural assembly framing, floor and ceiling joists, and other framing surfaces within the construction cavity.
04	If multiple layers are applied, each foam lift (e.g., spray application) adheres to the substrate and foam interfaces.
05	Closed cell SPF: In areas where an air barrier is required the foam is at least 2-inches thick.
06	Open cell SPF: In areas where an air barrier is required the foam is at least 5.5-inches thick.
07	Open cell SPF: Depressions in the foam insulation surface are not greater than ½-inch of the required thickness provided these depressions do not exceed 10% of the surface area being insulated.
08	Open cell SPF: Insulation completely fills cavities of 2x4 framing.
09	SPF insulation is not applied directly to recessed lighting fixtures unless specifically allowed by manufacturer's instructions. When not allowed, can lights are: A. Covered with a minimum of 1.5-inches of mineral fiber insulation; or B. Enclosed in a manufacturer's approved box fabricated from an approved material, such as 18 gauge sheet metal or ½-inch gypsum board.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-ENV-22-H
Quality Insulation Installation (QII) – Insulation - ENV-22	(Page 1 of 2)

## CF2R-ENV-22 User Instructions

Quality Insulation Installation (QII) applies to the entire building (roof/ceiling, walls, and floor) for new construction and requires field verification by a third-party ECC Rater. For additions to existing buildings, compliance credit can only be taken when the “existing, plus addition, plus alteration” approach is used, but credit will only apply the new surfaces in the new zone.

### A. Insulation Materials Installed

1. Roof Deck Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
2. Ceiling Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
3. Exterior Wall Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
4. Raised Floor Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).
5. Slab Edge Insulation Material Installed: Using the drop down menu, indicate what type of insulation material is being installed (e.g., Batt and Blanket, Rigid Board, SPF, etc.).

### B. All Surfaces

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### C. Raised Floor Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### D. Wall Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### E. Ceiling Adjacent to Unconditioned Space

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### F. Ceiling Insulation in Vented Attics

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### G. Insulation in Unvented Attics

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### H. Insulation in Vented Attics (High Performance Vented Attics)

The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.

### **I. Special Requirements for Skylight Shafts and Attic Knee Walls**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

### **J. Special Requirements for Floors Above Garage**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

### **K. Special Requirements for Cantilevered Floors**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

### **L. Special Requirements for Attached Porches**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

### **M. Special requirements for SPF Insulation**

The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.

### **Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Installed Lighting and Controls**

Select Yes or No according to whether your work on the project includes each of the following types of lighting and controls. See Sections B through J for applicable requirements.

01	High Luminous Efficacy luminaires installed in any interior rooms. (See Section B.)	
02	Recessed downlight luminaires in ceilings in any interior rooms. (See Section C.)	
03	Light Sources in Enclosed or Recessed Luminaires (other than recessed downlights in ceilings). (See Section D.)	
04	Lighting controls in bathrooms. (See Section E.)	
05	Lighting controls in garage. (See Section E.)	
06	Lighting controls in laundry rooms. (See Section E.)	
07	Lighting controls in utility rooms. (See Section E.)	
08	Lighting controls in walk-in closets. (See Section E.)	
09	Lighting controls in interior rooms except bathrooms, garages, laundry rooms, utility rooms, and walk-in closets. (See Section F)	
10	Internally illuminated address signs. (See Section G.)	
11	Outdoor lighting and controls. (See Section H.)	
12	Parking Garages for eight or more Vehicles. (See Section I)	
13	Blank Electrical Boxes installed more than 5 feet from finished floor. (See Section J.)	

**B. High Luminous Efficacy Luminaires**

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	<p>150.0(k)1A: All installed luminaires and light sources shall comply with Reference Joint Appendix JA8 and shall be certified and marked as required by JA8. :</p> <ul style="list-style-type: none"> <li>JA8 compliant light sources and the light sources are marked with "JA8-2025" or "JA8-2025-E".</li> </ul> <p>Exception 1: Integrated device lighting: Lighting integral to exhaust fans, kitchen range hoods, bath vanity mirrors, garage door openers, and ceiling fan kits that are subject to DOE's Appliance and Equipment Standards Program. Exception 2: Navigation Lighting rated less than five watts, such as night lights, and path lights.</p> <p>Exception 3: Lighting with an efficacy of 45 lumens per watt or greater and located internal to drawers, cabinetry, or linen closets.</p> <p>Exception 4: Light sources as follows:</p> <ol style="list-style-type: none"> <li>LED light sources installed outdoors;</li> <li>inseparable solid state lighting (SSL) luminaires containing colored light sources that are installed to provide decorative lighting;</li> <li>High intensity discharge (HID) light sources including pulse start metal halide and high pressure sodium light sources; and</li> <li>Luminaires with hardwired high frequency generator and induction lamp</li> </ol>
02	<ul style="list-style-type: none"> <li>Lighting shall have readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF</li> </ul>

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Recessed Downlight Luminaires in Ceilings**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	150.0(k)1Ci: Do not contain screw based lamp sockets.
02	The luminaire is marked with "JA8-2025".
03	150.0(k)1Cii: Has label certifying the luminaires are airtight with air leakage less than 2.0 cfm at 75 Pascals when tested in accordance with ASTM E283. An exhaust fan housing with integral light shall not be required to be certified airtight. Exception: Recessed luminaires marked for use in fire-rated installations extruded into ceiling space and recessed luminaires installed in non-insulated ceilings.
04	150.0(k)1Ciii: Sealed with a gasket or caulk between the luminaire housing and ceiling, and all air leakage paths between conditioned and unconditioned spaces are sealed with a gasket or caulk, or be installed per manufacturer's instructions to maintain airtightness between the luminaire housing and ceiling. Exception: Recessed luminaires marked for use in fire-rated installations, and recessed luminaires installed in non-insulated ceilings.
05	150.0(k)1Civ: Meet the following requirements (California Electrical Code Article 410.116). <ul style="list-style-type: none"><li>• A recessed luminaire that is not identified for contact with insulation shall have all recessed parts spaced not less than 1/2 inch from combustible materials. The points of support and the trim finishing off the openings in the ceiling shall be permitted to be in contact with combustible materials.</li><li>• A recessed luminaire that is identified for contact with insulation, Type IC, shall be permitted to be in contact with combustible materials at recessed parts, points of support, and portions passing through or finishing off the opening in the building structure.</li><li>• Thermal insulation shall not be installed above a recessed luminaire or within 3 inches of the recessed luminaire's enclosure, wiring compartment, ballast, transformer, LED driver, or power supply unless the luminaire is identified as Type IC for insulation contact.</li></ul>

**D. Light sources in enclosed or recessed luminaires (other than recessed downlight luminaires in ceilings)**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	150.0(k)1D: <b>Light Sources in Enclosed or Recessed Luminaires.</b> Lamps and other separable light sources in enclosed or recessed luminaires shall be in compliance with the JA8 elevated temperature requirements (in Section JA8.5), including marking requirements (marked with "JA8-2025-E").

**E. Lighting Controls in bathrooms, garages, laundry rooms, utility rooms, and walk-in closets**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	150.0(k)2Ei: In <b>bathrooms, garages, laundry rooms, utility rooms, and walk-in closets</b> , at least one installed luminaire is controlled by an occupancy or vacancy sensor providing automatic-off functionality.
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Lighting Controls in any interior rooms**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	150.0(k)2Eii: For lighting internal to drawers and cabinetry with opaque fronts or doors, the lighting has controls to turn light off when the drawer or door is closed are provided.
02	150.0(k)2F: Lighting in habitable spaces, including living rooms, dining rooms, kitchens, and bedrooms, have readily accessible wall-mounted dimming controls that allow the lighting to be manually adjusted up and down. Forward phase cut dimmers controlling LED light sources in these spaces comply with NEMA SSL 7A.  EXCEPTION 1: Ceiling fans may provide control of integrated lighting via a remote control. Lighting integral to kitchen range hoods and bathroom exhaust fans EXCEPTION 2: Luminaires connected to a circuit with controlled lighting power less than 20 watts or controlled by an occupancy or vacancy sensor providing automatic-off functionality. EXCEPTION 3: Navigation lighting rated less than 5 watts, such as night lights, step lights, and path lights. Lighting controlled by automatic-off controls and located internal to drawers, cabinetry with opaque fronts, or cabinetry with doors.
03	150.0(k)2A: Lighting has readily accessible wall-mounted controls that allow the lighting to be manually turned ON and OFF.
04	150.0(k)2C: All lighting controls. Lighting controls comply with the applicable requirements in Section 110.9.
05	150.0(k)2D: Controls permitted. An energy management control system (EMCS) or a multi-scene programmable control can be used to comply with dimming, occupancy, and lighting control requirements in Section 150.0(k)2 if it provides the functionality of the specified controls in accordance with Section 110.9 and the physical controls specified in Section 150.0(k)2A. No controls shall bypass control functions of a dimmer, occupant sensor, or vacancy sensor where the dimmer or sensor has been installed to comply with Section 150.0(k)2.
06	150.0(k)2G: Independent controls <ul style="list-style-type: none"><li>• Lighting integral to exhaust fans is controlled independently from the fans.</li><li>• Undercabinet lighting, undershelf lighting, interior lighting of display cabinets, and switched outlets are controlled separately from ceiling installed lighting.</li></ul>

**G. Address Signs**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	150.0(k)4: Internally illuminated address signs. Internally illuminated address signs shall either: <ul style="list-style-type: none"><li>• Comply with Section 140.8. Applicable nonresidential sign lighting compliance forms shall also be submitted; or</li><li>• Consume no more than five Watts of power.</li></ul>
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Outdoor Lighting and Controls**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	150.0(k)1A High efficacy outdoor lighting or LED light sources are installed.
02	<p>1. 150.0(k)3A: Outdoor lighting permanently mounted to a residential building or to the other buildings on the same lot shall meet the following requirements:</p> <ul style="list-style-type: none"><li>Controlled by a manual ON and OFF control switch that permits the automatic actions of items ii below; and</li><li>Controlled by one of the following controls:<ul style="list-style-type: none"><li>a. a photocell and a motion sensor; or</li><li>b. a photocell and an automatic time switch control; or</li></ul></li><li>c. Controlled by an astronomical time clock control.</li></ul> <p>2. 150.0(k)3B: Controls that override to ON shall not be allowed unless the override automatically returns the automatic control to its normal operation within six hours.</p> <p>3. 150.0(k)3C: An energy management control system (EMCS) or other controls that provides the specified lighting control functionality and complies with all requirements applicable to the specified controls may be used to meet the above requirements.</p>

**I. Lighting for Residential Garages for Eight or More Vehicles**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	150.0(k)5: Lighting complies with the applicable requirements for nonresidential garages in Sections 110.9, 130.0, 130.1, 130.4, 140.6, and 141.0. Applicable LTG forms shall also be submitted.
----	--

**J. Blank Electrical Boxes**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	150.0(k)1E: The number of electrical boxes that are more than five feet above the finished floor and do not contain a luminaire or other device shall be no greater than the number of bedrooms. These electrical boxes shall be served by a dimmer, vacancy sensor control, low voltage wiring, or fan speed control.
----	--



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

## CF2R-LTG-01-E User Instructions

The CF2R-LTG-01-E is primarily used for demonstrating compliance with the residential lighting Standards for single-family dwellings.

Do not use this form to demonstrate compliance with lighting in high rise residential dwelling units and multi-family dwelling units.

### Section A. Installed Lighting and Controls

This table is used to identify the scope of the work being covered by the responsible person signing this document. One person may be responsible for all of the measures in this table, or several people may each be responsible for only a portion of the measures. If several people are responsible, each person must separately fill out this Certificate of Installation for those measures for which they are responsible. In some situations, such as for alterations and additions, only some of the measures may be included in the total scope of work.

For rows 1 through 15 – insert ‘Y’ for each measure that is included in the scope of work, and insert ‘N’ for each measure that is not included in the scope of work.

### Section B. High Luminous Efficacy Luminaires

This table is a list of mandatory requirements for high Luminous efficacy luminaires.

### Section C. Recessed Downlight Luminaires in Ceilings

This table is a list of mandatory requirements for recessed downlight luminaires in ceilings.

**Section D. Light sources in enclosed or recessed luminaires (other than recessed downlight luminaires in ceilings).** This table is a list of Light sources in enclosed or recessed luminaires.

### Section E. Lighting Controls in bathrooms, garages, laundry rooms, and utility rooms, and walk-in closets.

This table is a list of mandatory requirements for LED luminaires.

### Section F. Lighting Controls in any interior rooms

This table is a list of mandatory requirements for Lighting Controls in any interior rooms. .

### Section G. Address Signs.

This table is a list of mandatory requirements for Address Signs.

### Section H. Outdoor Lighting and Controls

This table is a list of mandatory requirements for Outdoor Lighting and Controls.

### Section I. Lighting for Residential Garages for Eight or More Vehicles

This table is a list of mandatory requirements for Lighting for Residential Garages for Eight or More Vehicles

### Section J. Blank Electrical Boxes

This table is a list of mandatory requirements for Blank Electrical Boxes.

# **Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

Notes:

- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
- The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 150.0(h))	
07	Outdoor Design Condition Source (See Section 150.0(h)2		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	

**MCH-01a – Space Conditioning Systems Ducts and Fans - For use with Performance Certificate of Compliance**



## SPACE CONDITIONING SYSTEMS DUCTS AND FANS

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B. Design Space Conditioning (SC) System Component Specifications from CF1R**

This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from CF1R	SC System Type	Heating System Type	Cooling System Type	Central Fan Ventilation Cooling System Type	Distribution System Type	Required Thermostat Type	Low Leakage Air-Handling Unit Status	Bypass Duct Status	Cooling Zoning Type	Cooling System Compressor Speed Type
Notes:										

**C. Design Space Conditioning (SC) System Compliance Requirements from CF1R**

This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.

01	02	03	04	05	06a	06	07	08	09	10	11	12
SC System ID/ Name from CF1R	Heating Efficiency Type	Minimum Heating Efficiency Value	Heat Pump Heating Capacity @ 47°F	Heat Pump Heating Capacity @ 17°F	Cooling Efficiency Type	Minimum Cooling Efficiency SEER/SEER2	Minimum Cooling Efficiency EER/EER2/ CEER	Minimum Cooling System Airflow Rate (CFM/ton)	Maximum SC System Fan Efficacy (W/CFM )	Modeled Duct R-Value	Central Fan Ventilation Cooling Airflow	Central Fan Ventilation Cooling Fan Efficacy
Notes:												

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Installed Space Conditioning (SC) System Component Information**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Conditioned Floor Area Served by the System (ft <sup>2</sup> )	Heating System Type	Cooling System Type	Number of Indoor Units for this System	Distribution System Type	SC System Thermostat Type	Cooling Zoning Type	Cooling System Compressor Speed Type

**E. Installed Heating Equipment Information (not heat pumps)**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Duct Status	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)

Notes:

**F. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Cooling Efficiency SEER/SEER2	Cooling Efficiency EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)	Condenser Rated Cooling Capacity (Btu/h)

Notes:

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****G. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.**

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Type	Indoor Unit Duct Status	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Manufacturer	Indoor Unit Model Number	Indoor Unit Serial Number	Indoor Unit Nominal Cooling Capacity (ton)

Notes:

**H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

01	02	03	04	05
SC System ID/Name from CF1R	SC System Description of Area Served	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number

Notes:

**I. Installed Heat Pump System – Efficiency and Performance Compliance Information**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	System Rated Heating Capacity at 47°F	System Rated Heating Capacity at 17°F	System Rated Cooling Efficiency SEER/SEER2	System Rated Cooling Efficiency EER/EER2/CEER	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)

Notes:

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. Installed Duct System information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Supply Duct Location	Supply Duct R-Value	Return Duct Location	Return Duct R-Value	Exception from Min R-Value	Method of compliance with Airflow and Fan Efficacy Req's in 150.0(m)13	Bypass Duct Status	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this system?	Total Duct Length
Notes:													

**K. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	13
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
Notes:												



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****L. Air Filter Device Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Mandatory Air Filter Device Requirements can be found in Section 150.0(m)12A-E. Some mandatory requirements may apply in addition to those listed below.

01	All recirculated air and all outdoor air (including make up air) supplied to the occupiable space is filtered before passing through the system's thermal conditioning components.
02	The space conditioning system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack location that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter device, readily legible, and visible to a person replacing the air filter.
03	All system air filter devices shall be located and installed in such a manner as to allow access and regular service by the system owner.
04	The system shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 $\mu\text{m}$ range and equal to or greater than 85 percent in the 1.0-3.0 $\mu\text{m}$ range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
06	Filter racks or grilles shall use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.

**M. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design - Table 150.0-B or C	MCH-29 Supply Duct Surface Area R-Value Buried Ducts	MCH30 Central Fan Ventilation Cooling Credit
Notes:									

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****N. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03	04	05
		MCH-25	MCH-26	MCH-33
SC System ID or Name from CF1R	SC System Description of Area Served	Refrigerant Charge	Rated SC System Equipment Verification	VCHP Compliance Credit
Notes:				

**O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(c).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).

**Cooling Equipment**

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)1 and 2, and Section 150.0(m)9.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer's specifications 150.0(h)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Cooling and Heating Equipment (Additional Requirement)**

11	<b>System Selection:</b> See section 150.0(h)5 A. Equipment sizing and selection shall meet the cooling and heating loads of Section 150.0(h)1 and 2. B. Systems shall be sized based on ACCA Manual S-2023 in accordance with these requirements: i. <b>Cooling Capacity:</b> There is no limit on the minimum capacity. ii. <b>Furnaces:</b> Heating capacity shall be sized based on ACCA Manual S-2023, Table N2.5. iii. <b>Heat Pump Heating Capacity:</b> a. Minimum: Heating systems are required to have a heating capacity meeting the minimum requirements of the CBC not including any supplementary heating. b. Maximum: There is no limit on the maximum heating capacity.
12	<b>Defrost:</b> See section 150.0(h)6 and the exceptions. A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes. B. The installer shall certify on the Certificate of Installation (CF2R) that the control configuration has been tested in accordance with the testing procedure in the CF2R. <b>Exception 1 to Section 150.0(h)6.</b> Dwelling units in Climate Zones 6 and 7. <b>Exception 2 to Section 150.0(h)6.</b> Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15.
13	<b>Supplementary heating control configuration:</b> See section 150.0(h)7. Heat pumps with supplementary heat, including, but not limited to, electric resistance heaters or gas furnace supplementary heating, shall comply with the following requirements: <b>See section 150.0(h)7 for exceptions.</b> A. Lock out supplementary heating above an outdoor air temperature of no greater than 35°F. There are additional thermostat requirements in section 150.0(i)2. B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure found in the CF2R. C. The controls may allow supplementary heater operation above 35°F only during defrost; or when the user selects emergency operation.
14	<b>Sizing of electric resistance supplementary heat:</b> See section 150.0(h)8. For heat pumps with electric resistance heating, the capacity of electric resistance heat shall not exceed the heat pump nominal cooling capacity (at 95°F ambient conditions) multiplied by 2.7 kW per ton, rounded up to the closest kW.
15	<b>Capacity variation with third-party thermostats:</b> See section 150.0(h)9 Variable or multi-speed systems shall comply with the following requirements: A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed, and meet thermostat requirements in section 150.0(i)2.

**Air Distribution System Ducts, Plenums and Fans**

16	<b>Insulation:</b> The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1B for exceptions.
17	<b>Connections and Closures:</b> All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Heat Pump Thermostat**

18	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
14 19	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
20	First stage of heating shall be assigned to heat pump heating.
21	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.
22	Setback thermostats: All heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have a setback thermostat, as specified in Section 110.2(c). See Section 150.0(i)1
23	<p>Thermostats that are applied to heat pumps with supplemental heating: See Section 150.0(i)2</p> <p>The thermostats controlling heat pumps with electric resistance supplementary heat or gas furnace supplementary heat shall comply with the following requirements: See Section 150.0(i)2 for exceptions.</p> <p>A. The thermostat shall receive outdoor air temperature from an outdoor air temperature sensor or from an internet weather service.</p> <p>B. The thermostat shall display the outdoor air temperature.</p> <p>C. The thermostat and heat pump shall lock out supplementary heat when the outdoor air temperature is above 35°F.</p> <p>D. The thermostat shall have an indicator to notify when supplementary heat or emergency heat is in use.</p> <p>E. During defrost or when the user selects emergency heating, supplementary heat operation is permitted above 35°F.</p>

**P. Test of Defrost Delay Timer Setting**

The installing contractor shall confirm that a heat pump's installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	<p>Test Applicability. Select the statement describing test applicability for this project:</p> <ol style="list-style-type: none"> <li>The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions.</li> <li>The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost.</li> <li>The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies.</li> <li>The test does not apply because Exception 2. Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.</li> </ol>	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump's Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (for example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Q. Test of Supplementary Heating Lockout**

The installing contractor shall confirm the heat pump or thermostat is configured to lock out supplementary heating anytime the outdoor air temperature is above 35°F.

01	Test Applicability. Select the statement describing test applicability for this project: 1. The test applies because the heating system is a heat pump with supplementary heating and there are no exceptions. 2. The test does not apply because the heating system does not include a heat pump with auxiliary heating. 3. The test does not apply because Exception 1. Heat pump being installed in a single family dwelling unit in Climate Zones 7 or 15. 4. The test does not apply because Exception 2 . Heat pump being installed in a single family dwelling unit with a conditioned floor area of 500 square feet or less.	
02	If supplementary heating is electric resistance, what is its rated capacity (kW)?	
03	If supplementary heating is gas, what is its rated input capacity (kBtu/hr)?	
04	Confirming Configuration of Controls. Specify the mechanism for locking out the supplementary heating (for example, the name of supplementary heating lockout setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts lockout temperature). If there is no mechanism to lock out supplementary heating above a temperature no greater than 35°F this test fails.	
05	Record supplementary heating lock-out setting (for example, the numeric thermostat lock-out setpoint, dip switch position, jumper configuration, or dial setting).	
06	At what Outdoor Air Temperature (OAT) are the controls configured to begin locking out supplementary heating? If this number is above 35°F this test fails.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

## CF2R-MCH-01a-E User Instructions

### Section A. General Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the CF1R-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit. This field is filled out automatically using the default value from the CF1R-PRF for performance compliance, and is user entry for prescriptive compliance. The default value from the CF1R-PRF may be overwritten in this

document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

### Section B. Design Space Conditioning (SC) System Component Specifications from CF1R

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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8. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
9. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
10. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
11. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.

### Section C. Design Space Conditioning (SC) System Compliance Requirements from CF1R

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.



CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-MCH-01-E
Space Conditioning Systems, Ducts, and Fans - MCH-01	(Page 3 of 9)

4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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- 6a. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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12. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.

#### **Section D. Installed Space Conditioning (SC) System Component Information**

1. Select System name from the list of systems identified in previous sections and originally specified on the CF1R.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.
4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

6. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

#### Section E. Installed Heating Equipment Information (not heat pumps)

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. This field is filled out automatically. It is referenced from the same row and column in Section C.
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

**Section F. Installed Cooling System Outdoor Unit or Package Unit Equipment Information (not heat pump)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
4. Enter the certified cooling efficiency (EER/EER2/CEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.
10. Enter the *installed* Condenser Rated Cooling Capacity in BTU/h. Note that this is based on the condenser, not the coil or air handler.

**Section G. Installed Split System Indoor Unit Coil or Fan Coil Equipment information - applicable to DX or hydronic, heating or cooling, coils or fan coil units)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes.
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.
10. Enter the indoor unit cooling capacity if the indoor unit is one of the ducted variable capacity heat pumps types, otherwise this field is not needed.

### Section H. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

### Section I. Installed Heat Pump System – Efficiency and Performance Compliance Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency (EER/EER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
10. Enter the installed Condenser Rated Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

### Section J. Installed Duct System Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

5. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
6. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
8. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
9. For newly constructed systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 150.0(m)13 and Residential Compliance Manual Chapter 4.4 for more information.
10. This field is filled out automatically. It appears in Section B, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. Specify the number of air filter devices installed in this indoor unit's duct system. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
12. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
13. If the system is of a type that can use the approved protocol protocols for verifying the indoor unit's fan efficacy, then answer yes. Otherwise answer no.
14. This field is filled out automatically for some system types. Otherwise select the value that describes the length of the duct system.

#### Section K. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).

7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 standards encourages use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

#### Section L. Air Filter Device Requirements

This table is a list of requirements for air filter devices.

#### Section M. ECC Verification Requirements for Duct Systems

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
10. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

#### Section N. ECC Verification Requirements for Space Conditioning Equipment

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

**Section O. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section P. Test of Defrost Delay Timer Setting** (Section 150.0(h)6)

This table is certification requirements for Test of Defrost Delay Timer Setting

**Section Q. Test of Supplementary Heating Lockout** Section 150.0(H)7

This table is certification requirements for Test of Supplementary Heating Lockout

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

Notes:

- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
- The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.
- In fields A13 and A14,
  1. If the airflow is verified to be 350 CFM/ton or higher there is no maximum capacity (Section 150.2(a)1Eii) and user should enter N/A.
  2. If the space conditioning system is ductless (Exception 1 to Section 150.2(a)1Eii), user should enter N/A.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 150.0(h).)	
07	Outdoor Design Condition Source (See Section 150.0(h)2		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	
This table reports for Addition only, if project scop on the CF1R do not have Additions, then display the "section does not apply" message					
13	Maximum Heating Capacity According to Table 150.2-A (Btu/h)		14	Maximum Cooling Capacity According to Table 150.2-B (Btu/h)	
15	Envelope Leakage Specified in Load Calculation (ACH)		16	Source of Envelope Leakage Specified in Load Calculation	

**MCH-01b - Space Conditioning Systems Ducts and Fans - Prescriptive Alterations**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026





## SPACE CONDITIONING SYSTEMS DUCTS AND FANS

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B. Space Conditioning (SC) System Information**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	CFA served by this SC System (ft <sup>2</sup> ):	Is the SC system a ducted system?	Does work include installing a refrigerant containing component?	Does work include installing new SC System components?	Does work include installing more than 25 feet of ducts?	Does work include installing entirely new duct system?	Does work include installing entirely new SC system?	Alteration Type
Notes:									

**C. Space Conditioning (SC) System Alterations Compliance Information**

01	02	03	04	05	06	07	08	09	10	10b	11	12	13	14
SC System ID/Name from CF1R	SC System Description of Area Served	Heating System Type	Altered Heating Component	Heating Efficiency Type	Heating Minimum Efficiency Value	Cooling System Type	Altered Cooling Components	Cooling Efficiency Type	Cooling Minimum Efficiency Value SEER/SEER2	Cooling Minimum Efficiency Value EER/EER2 /CEER	Required Thermostat Type	Number of Indoor Units for this System	Number of Ducted Indoor Units for this System	Central Fan Integrated (CFI) Ventilation System Status
Notes:														

**D. Installed Heating Equipment Information for Gas Furnace Indoor Unit, or Heat Pump Indoor Unit, or Packaged Unit (Gas Furnace or Heat Pump)**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)	Multi-Split Systems only	
								Indoor Unit Name or Description of Area Served	Indoor Unit Duct Status
Notes:									

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. Installed Cooling Equipment Information for Outdoor Condenser or Package Unit (Air Conditioner or Heat Pump)**

01	02	03	04	04b	05	06	07	08	09
SC System ID/Name from CF1R	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency Value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Capacity (tons)
Notes:									

**F. Altered Space Conditioning System Duct Information (<75% of duct system is altered; or duct system is not altered)**

01	02	03	04	05	06	07	08	09	10	11	12
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Was Any New Ducting Installed?	Required New Duct R-Value	Installed New Supply Duct Location	Installed New Supply Duct R-Value	Installed New Return Duct Location	Installed New Return Duct R-Value	Exception from Min R-Value	Can Approved Airflow Protocols be used to test this System?	Indoor Unit Nominal Cooling Capacity (tons)
Notes:											

**G. Installed New or Complete Replacement Duct System information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Total Duct Length	Required New Duct R-Value (Unconditioned Space)	Supply Duct Location	New or Replaced Supply Duct R-Value	Return Duct Location	New or Replaced Return Duct R-Value	Exception from Min R-Value	Method of Compliance with Airflow and Fan Efficacy Req's in 150.0(m)13	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this System?	Indoor Unit Nominal Cooling Capacity (tons)
Notes:														

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	13
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)

Notes:

**I. Air Filter Device Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

Mandatory Air Filter Device Requirements can be found in Section 150.0(m)12A-E. Some mandatory requirements may apply in addition to those listed below.

01	All recirculated air and all outdoor air (including make up air) supplied to the occupiable space is filtered before passing through the system's thermal conditioning components.
02	The space conditioning system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack location that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter grille/rack, readily legible, and visible to a person replacing the air filter.
03	All system air filter devices shall be located and installed in such a manner as to allow access and regular service by the system owner.
04	The system shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50 percent in the 0.30-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
06	Filter racks or grilles shall use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	08	09
SC System Identification or Name	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Exemption From Duct Leakage Requirements	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design - Table 150.0-B or C
Notes:								

**K. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03
SC System ID/Name from CF1R	SC System Description of Area Served	MCH-25 Refrigerant Charge
Notes:		

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****L. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(c).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2, and the exceptions.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).

**Cooling Equipment**

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)1 and 2, and Section 150.0(m)9.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer's specifications 150.0(h)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2, and the exception.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Cooling and Heating Equipment (Additional Requirement)**

11	<b>System Selection:</b> See section 150.0(h)5 A. Equipment sizing and selection shall meet the cooling and heating loads of Section 150.0(h)1 and 2. B. Systems shall be sized based on ACCA Manual S-2023 in accordance with these requirements: i. <b>Cooling Capacity:</b> There is no limit on the minimum capacity. ii. <b>Furnaces:</b> Heating capacity shall be sized based on ACCA Manual S-2023, Table N2.5. iii. <b>Heat Pump Heating Capacity:</b> a. Minimum: Heating systems are required to have a heating capacity meeting the minimum requirements of the CBC not including any supplementary heating. b. Maximum: There is no limit on the maximum heating capacity.
12	<b>Defrost:</b> See section 150.0(h)6 and the exceptions. A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes. B. The installer shall certify on the Certificate of Installation (CF2R) that the control configuration has been tested in accordance with the testing procedure in the CF2R. <b>Exception 1 to Section 150.0(h)6.</b> Dwelling units in Climate Zones 6 and 7. <b>Exception 2 to Section 150.0(h)6.</b> Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15.
13	<b>Supplementary heating control configuration:</b> See section 150.0(h)7. Heat pumps with supplementary heat, including, but not limited to, electric resistance heaters or gas furnace supplementary heating, shall comply with the following requirements: <b>See section 150.0(h)7 for exceptions.</b> A. Lock out supplementary heating above an outdoor air temperature of no greater than 35°F. There are additional thermostat requirements in section 150.0(i)2. B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure found in the CF2R. C. The controls may allow supplementary heater operation above 35°F only during defrost; or when the user selects emergency operation.
14	<b>Sizing of electric resistance supplementary heat:</b> See section 150.0(h)8. For heat pumps with electric resistance heating, the capacity of electric resistance heat shall not exceed the heat pump nominal cooling capacity (at 95°F ambient conditions) multiplied by 2.7 kW per ton, rounded up to the closest kW.
15	<b>Capacity variation with third-party thermostats:</b> See section 150.0(h)9 Variable or multi-speed systems shall comply with the following requirements: A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed, and meet thermostat requirements in section 150.0(i)2.

**Air Distribution System Ducts, Plenums and Fans**

16	<b>Insulation:</b> The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1B for exceptions.
17	<b>Connections and Closures:</b> All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Heat Pump Thermostat**

18	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
19	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
20	First stage of heating shall be assigned to heat pump heating.
21	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.
22	Setback thermostats: All heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have a setback thermostat, as specified in Section 110.2(c). See Section 150.0(i)1
23	<p>Thermostats that are applied to heat pumps with supplemental heating: See Section 150.0(i)2</p> <p>The thermostats controlling heat pumps with electric resistance supplementary heat or gas furnace supplementary heat shall comply with the following requirements: See Section 150.0(i)2 for exceptions.</p> <p>A. The thermostat shall receive outdoor air temperature from an outdoor air temperature sensor or from an internet weather service.</p> <p>B. The thermostat shall display the outdoor air temperature.</p> <p>C. The thermostat and heat pump shall lock out supplementary heat when the outdoor air temperature is above 35°F.</p> <p>D. The thermostat shall have an indicator to notify when supplementary heat or emergency heat is in use.</p> <p>E. During defrost or when the user selects emergency heating, supplementary heat operation is permitted above 35°F.</p>

**Space Conditioning Load Calculations and System Capacity for Additions**

24	Minimum capacity limits and supplemental heating requirements are as described in Section 150.0(h)
25	<p>The maximum capacity depends on the relative sizes of the calculated heating design load (HL) and cooling design load (CL), the type of space conditioning system, and the duct sizing.</p> <p><b>See section 150.2(a)1Eii for exceptions</b></p> <p>a. In situations where airflow is field verified to be at least 350 cfm/ton, there is no maximum capacity limit.</p> <p>b. In situations where airflow is NOT field verified to be at least 350 cfm/ton, the system capacities shall be no larger than indicated in Table 150.2-A for heating and Table 150.2-B for cooling.</p>
26	For additions, the envelope leakage specified in the load calculation shall be no greater than the values shown in Table 150.2-C. <b>See section 150.2(a)1Eiii for exceptions</b>

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****M. Test of Defrost Delay Timer Setting**

The installing contractor shall confirm that a heat pump's installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	Test Applicability. Select the statement describing test applicability for this project: 1. The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions. 2. The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost. 3. The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies. 4. The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump's Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****N. Test of Supplementary Heating Lockout**

The installing contractor shall confirm the heat pump or thermostat is configured to lock out supplementary heating anytime the outdoor air temperature is above 35°F.

01	Test Applicability. Select the statement describing test applicability for this project: The test applies because the heating system is a heat pump with supplementary heating and there are no exceptions. The test does not apply because the heating system does not include a heat pump with auxiliary heating. The test does not apply because Exception 1. Heat pump being installed in a single family dwelling unit in Climate Zones 7 or 15. The test does not apply because Exception 2 . Heat pump being installed in a single family dwelling unit with a conditioned floor area of 500 square feet or less.	
02	If supplementary heating is electric resistance, what is its rated capacity (kW)?	
03	If supplementary heating is gas, what is its rated input capacity (kBtu/hr)?	
04	Confirming Configuration of Controls. Specify the mechanism for locking out the supplementary heating (for example, the name of supplementary heating lockout setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts lockout temperature). If there is no mechanism to lock out supplementary heating above a temperature no greater than 35°F this test fails.	
05	Record supplementary heating lock-out setting (for example, the numeric thermostat lock-out setpoint, dip switch position, jumper configuration, or dial setting).	
06	At what Outdoor Air Temperature (OAT) are the controls configured to begin locking out supplementary heating? If this number is above 35°F this test fails.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

## CF2R-MCH-01b-E User Instructions

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

Completing these documents will require that you have the Reference Appendices for the 2025 Building Energy Efficiency Standards. This document contains the Joint Appendices which are used to determine climate zone and to complete the section for opaque surfaces.

When the term CF2R is used it means the CF2R-MCH-01-H.

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

### Section A. General Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the CF1R may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems (see definition in Section 9.6.9 of the RCM) must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.

10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit.

### Section B. Space Conditioning (SC) System Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.

7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
10. This field is filled out automatically based on the entries in the previous columns.

### Section C. Space Conditioning (SC) System Alterations Compliance Information

1. This field is filled out automatically. It is referenced from the previous section.
2. This field is filled out automatically. It is referenced from the previous section.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.

7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
10. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
- 10b. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel. Revising the CF1R to match is recommended and may be required.
11. This field is filled out automatically. It is calculated based on entries in previous columns.
12. If the space conditioning system is a multiple-split system, then enter the total number of indoor units (ducted and ductless) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
13. If the space conditioning system is a multiple-split system, then enter the number of ducted indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
14. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Select CFI System if the system is used to provide IAQ ventilation.

### Section D. Installed Heating Equipment Information

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from a previous section.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
8. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.
9. Enter text to provide a name for multi-split indoor units if prompted to do so, otherwise the field is filled out automatically.
10. Select the description that best describes the distribution system if prompted to do so (allowed values are 1:[Ductless] 2:[Ducted >10ft length] 3:[Ducted ≤10ft length], otherwise the field is filled out automatically.

### Section E. Installed Cooling Equipment Information:

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from Section C.
4. Enter the certified cooling efficiency of the *installed* equipment that corresponds to the type shown in the previous column. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
- 4b. Enter the certified cooling efficiency of the installed equipment that corresponds to the type shown in the previous column. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
4. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
5. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
7. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
8. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.

## Section F. Extension of Existing Duct System, Greater Than 25 Feet

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc.
4. If any lengths of new ducts were installed, answer yes, otherwise if new ducts were not installed, answer no.
5. This field is filled out automatically based on values referenced from other sections.
6. Select the choice that best describes the predominant location of the supply ducts for this system
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value required by the standards. The installed R-value must be greater than or equal to the required minimum R-value.
8. Select the choice that best describes the predominant location of the return ducts for this system
9. Enter the R-value of the installed return ducts. This value is verified against the minimum value required by the standards. The installed R-value must be greater than or equal to the required minimum R-value
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
11. Enter the indoor unit nominal cooling capacity (tons) if the indoor unit is a multiple-split system type, otherwise this field is not needed.

## Section G. Installed Duct System information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the description of the total combined length of the supply and return ducts on this indoor unit. The possible choices are: >10ft length, and ≤10ft length.
5. This field is filled out automatically. This is the minimum R-value for new ducts in this climate zone.
6. Select the choice that best describes the predominant location of the supply ducts for this system.
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value in G05. The installed R-value must be greater than or equal to the minimum R-value.
8. Select the choice that best describes the predominant location of the return ducts for this system.



9. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. Pick the appropriate choice. Refer to section 150.0(m)13 of the 2025 Building Energy Efficiency Standards, and Section 4.4 of Chapter 4 of the 2025 Residential Compliance Manual for more information.
12. Specify the number of air filter devices installed on this indoor unit. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
13. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
14. If the system is of a type that can use one of the approved protocols for testing the fan efficacy, then enter yes. Otherwise enter no.
15. Enter the indoor unit cooling capacity if the indoor unit is a multiple-split system type, otherwise this field is not needed.

#### Section H. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 standards encourage use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.

12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

### Section I. Air Filter Device Requirements

This table is a list of requirements for air filter devices.

### Section J. ECC Verification Requirements

1. This field is filled out automatically. It references previous sections in this document.
2. This field is filled out automatically. It references previous sections in this document.
3. This field is filled out automatically. It references previous sections in this document.
4. If applicable, select from the available exemptions listed. Exemptions will be flagged and may subject the system to additional enforcement scrutiny.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

### Section K. ECC Verification Requirements for Space Conditioning Equipment

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

### Section L. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section M. Test of Defrost Delay Timer Setting** (Section 150.0(h)6)

This table is certification requirements for Test of Defrost Delay Timer Setting

**Section N. Test of Supplementary Heating Lockout** (Section 150.0(H)7)

This table is certification requirements for Test of Supplementary Heating Lockout

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

Notes:

- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
- The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 150.0(h))	
07	Outdoor Design Condition Source (See Section 150.0(h)2		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	

**MCH-01c - Space Conditioning Systems Ducts and Fans - Prescriptive, Newly Constructed Buildings**

Registration Number:

Registration Date/Time:

ECC Provider:

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B. Design Space Conditioning (SC) System Component Specifications from CF1R**

This table reports the space conditioning system features that were specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	07	07b	08	09	10	11	12
SC System ID/Name from CF1R	Heating System Type	Heating Efficiency Type	Heating Efficiency Value	Cooling System Type	Cooling Efficiency Type	Cooling Efficiency Value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Distribution System Type	Duct Location	Duct R-value	Thermostat Type	Comments

**C. Installed Space Conditioning (SC) System Component Information**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from CF1R	SC System Description of Area Served	Conditioned Floor Area Served by the System (ft <sup>2</sup> )	Heating System Type	Cooling System Type	Distribution System Type	Duct Location	SC System Thermostat Type	Cooling Zoning Type	Cooling System Compressor Speed Type	Number of Indoor Units for this System

Notes:

**D. Installed Heating Equipment Information (not heat pumps)**

01	02	03	04	05	06	07	08	09	00	11
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Duct Status	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity Output (Btu/h)

Notes:

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)**

01	02	03	04	04b	05	06	07	08	09
SC System ID/Name from CF1R	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency Value SEER/SEER2	Cooling Efficiency Value EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)
Notes:									

**F. Installed Split System Indoor Unit (Coil or Fan Coil) Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.**

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Type	Indoor Unit Duct Status	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Manufacturer	Indoor Unit Model Number	Indoor Unit Serial Number	Indoor Unit Nominal Cooling Capacity (ton)
Notes:									

**G. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

01	02	03	04	05
SC System ID/Name from CF1R	SC System Description of Area Served	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number
Notes:				

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Installed Heat Pump System – Efficiency and Performance Compliance Information**

01	02	03	04	05	06	07	08	08b	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	System Rated Heating Capacity at 47°F (Btu/h)	System Rated Heating Capacity at 17°F (Btu/h)	System Cooling Efficiency Type	System Rated Cooling Efficiency Value SEER/SEER2	System Rated Cooling Efficiency Value EER/EER2/CEER	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)
Notes:										

**I. Installed Duct System Information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Supply Duct Location	Supply Duct R-Value	Return Duct Location	Return Duct R-Value	Exception from Min R-Value for Ducts In Conditioned Space	Method of compliance with Airflow and Fan Efficacy Req's in 150.0(m)13	Number of Air Filter Devices on System	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this System?	Total Duct Length	Required New Duct R-Value
Notes:													

**J. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	013
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
Notes:												

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****K. Air Filter Device Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Mandatory Air Filter Device Requirements can be found in Section 150.0(m)12A-E. Some mandatory requirements may apply in addition to those listed below.

01	All recirculated air and all outdoor air (including make up air) supplied to the occupiable space is filtered before passing through the system's thermal conditioning components.
02	The space conditioning system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter device shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack locations that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter device, readily legible, and visible to a person replacing the air filter.
03	All system air filters shall be located and installed in such a manner as to allow access and regular service by the system owner.
04	The system shall be provided with air filter media having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
06	Filter racks or grilles shall use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.

**L. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	09
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design Table 150.0-B or C
Notes:							

**M. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03
SC System ID or Name from CF1R	SC System Description of Area Served	MCH-25 Refrigerant Charge
Notes:		



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****N. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(c).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).

**Cooling Equipment**

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)1 and 2, and Section 150.0(m)9.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer's specifications 150.0(h)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Cooling and Heating Equipment (Additional Requirement)**

11	<b>System Selection:</b> See section 150.0(h)5 A. Equipment sizing and selection shall meet the cooling and heating loads of Section 150.0(h)1 and 2. B. Systems shall be sized based on ACCA Manual S-2023 in accordance with these requirements: i. <b>Cooling Capacity:</b> There is no limit on the minimum capacity. ii. <b>Furnaces:</b> Heating capacity shall be sized based on ACCA Manual S-2023, Table N2.5. iii. <b>Heat Pump Heating Capacity:</b> a. Minimum: Heating systems are required to have a heating capacity meeting the minimum requirements of the CBC not including any supplementary heating. b. Maximum: There is no limit on the maximum heating capacity.
12	<b>Defrost:</b> See section 150.0(h)6 and the exceptions. A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes. B. The installer shall certify on the Certificate of Installation (CF2R) that the control configuration has been tested in accordance with the testing procedure in the CF2R. <b>Exception 1 to Section 150.0(h)6.</b> Dwelling units in Climate Zones 6 and 7. <b>Exception 2 to Section 150.0(h)6.</b> Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15.
13	<b>Supplementary heating control configuration:</b> See section 150.0(h)7. Heat pumps with supplementary heat, including, but not limited to, electric resistance heaters or gas furnace supplementary heating, shall comply with the following requirements: <b>See section 150.0(h)7 for exceptions.</b> A. Lock out supplementary heating above an outdoor air temperature of no greater than 35°F. There are additional thermostat requirements in section 150.0(i)2. B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure found in the CF2R. C. The controls may allow supplementary heater operation above 35°F only during defrost; or when the user selects emergency operation.
14	<b>Sizing of electric resistance supplementary heat:</b> See section 150.0(h)8. For heat pumps with electric resistance heating, the capacity of electric resistance heat shall not exceed the heat pump nominal cooling capacity (at 95°F ambient conditions) multiplied by 2.7 kW per ton, rounded up to the closest kW.
15	<b>Capacity variation with third-party thermostats:</b> See section 150.0(h)9 Variable or multi-speed systems shall comply with the following requirements: A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed, and meet thermostat requirements in section 150.0(i)2.

**Air Distribution System Ducts, Plenums and Fans**

16	<b>Insulation:</b> The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1B for exceptions.
17	<b>Connections and Closures:</b> All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Heat Pump Thermostat**

18	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
14 19	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
20	First stage of heating shall be assigned to heat pump heating.
21	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.
22	Setback thermostats: All heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have a setback thermostat, as specified in Section 110.2(c). See Section 150.0(i)1
23	Thermostats that are applied to heat pumps with supplemental heating: See Section 150.0(i)2 The thermostats controlling heat pumps with electric resistance supplementary heat or gas furnace supplementary heat shall comply with the following requirements: See Section 150.0(i)2 for exceptions. A. The thermostat shall receive outdoor air temperature from an outdoor air temperature sensor or from an internet weather service. B. The thermostat shall display the outdoor air temperature. C. The thermostat and heat pump shall lock out supplementary heat when the outdoor air temperature is above 35°F. D. The thermostat shall have an indicator to notify when supplementary heat or emergency heat is in use. E. During defrost or when the user selects emergency heating, supplementary heat operation is permitted above 35°F.

**O. Test of Defrost Delay Timer Setting**

The installing contractor shall confirm that a heat pump's installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	Test Applicability. Select the statement describing test applicability for this project: 1. The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions. 2. The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost. 3. The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies. 4. The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump's Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****P. Test of Supplementary Heating Lockout**

The installing contractor shall confirm the heat pump or thermostat is configured to lock out supplementary heating anytime the outdoor air temperature is above 35°F.

01	Test Applicability. Select the statement describing test applicability for this project: 1. The test applies because the heating system is a heat pump with supplementary heating and there are no exceptions. 2. The test does not apply because the heating system does not include a heat pump with auxiliary heating. 3. The test does not apply because Exception 1. Heat pump being installed in a single family dwelling unit in Climate Zones 7 or 15. 1. The test does not apply because Exception 2 . Heat pump being installed in a single family dwelling unit with a conditioned floor area of 500 square feet or less.	
02	If supplementary heating is electric resistance, what is its rated capacity (kW)?	
03	If supplementary heating is gas, what is its rated input capacity (kBtu/hr)?	
04	Confirming Configuration of Controls. Specify the mechanism for locking out the supplementary heating (for example, the name of supplementary heating lockout setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts lockout temperature). If there is no mechanism to lock out supplementary heating above a temperature no greater than 35°F this test fails.	
05	Record supplementary heating lock-out setting (for example, the numeric thermostat lock-out setpoint, dip switch position, jumper configuration, or dial setting).	
06	At what Outdoor Air Temperature (OAT) are the controls configured to begin locking out supplementary heating? If this number is above 35°F this test fails.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

## CF2R-MCH-01c-E User Instructions

### Section A. General Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the CF1R- may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document, but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out), then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit

### Section B. Design Space Conditioning (SC) System Component Specifications from CF1R

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
- 7b. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
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11. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
12. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.

### Section C. Installed Space Conditioning (SC) System Component Information

1. Select System name from the list of systems identified in previous sections and originally specified on the CF1R.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.

4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document, but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
6. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).

#### **Section D. Installed Heating Equipment Information (not heat pumps)**

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc
4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.



6. This field is filled out automatically. It is referenced from the same row and column in the previous section
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in Btu/h.

**Section E. Installed Cooling System Outdoor Unit or Package Unit Equipment Information** (not heat pumps).

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency type for the installed equipment. Select a type from the list provided.
4. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section B. The installed efficiency must be greater than or equal to the required minimum efficiency.
- 4b. Enter the certified cooling efficiency of the installed equipment. This value is verified against the minimum value shown in Section B. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in Btu/h. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.

**Section F. Installed Split System Indoor Coil or Fan Coil Unit Equipment Information** (applicable to DX or hydronic heating/cooling coils or fan coil units)

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.

6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes.
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.
10. If there are multiple indoor units connected to the outdoor unit, enter the nominal cooling capacity (ton) from the nameplate of the indoor unit.

### Section G. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

### Section H. Installed Heat Pump System – Efficiency and Performance Compliance Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47°F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17°F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
- 8b. Enter the certified cooling efficiency of the installed equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in Btu/h.

10. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

### Section I. Installed Duct System Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field is filled out automatically. It appears in Section B and C, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
6. This field is filled out automatically. It appears in Section B and C, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are uncommon. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
8. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
9. For newly constructed systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 150.0(m)13 and Residential Compliance Manual Chapter 4.4 for more information.
10. Specify the number of air filter devices installed in this indoor unit's duct system. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
11. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Note: the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
12. If the system is of a type that can use the approved protocol protocols for verifying the indoor unit's fan efficacy, then answer yes. Otherwise answer no.
13. This field is filled out automatically for some system types. Otherwise select the value that describes the length of the duct system.
14. This field is filled out automatically.

### Section J. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 Standards encourage use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

### Section K. Air Filter Device Requirements.

This table is a list of requirements for air filter devices.

### Section L. ECC Verification Requirements for duct systems

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
7. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

8. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

**Section M. ECC Verification Requirements for Space Conditioning Equipment**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

**Section N. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

This table is a list of mandatory measures and additional requirements for space conditioning systems, ducts and fans.

**Section O. Test of Defrost Delay Timer Setting** (Section 150.0(h)6)

This table is certification requirements for Test of Defrost Delay Timer Setting

**Section P. Test of Supplementary Heating Lockout** Section 150.0(H)7

This table is certification requirements for Test of Supplementary Heating Lockout

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information****Notes:**

- The outdoor design temperatures for heating shall be  $\geq 99.0\%$  Heating Dry Bulb or the Heating Winter Median of Extremes values.
- The outdoor design temperatures for cooling shall be  $\leq 1.0\%$  Cooling Dry Bulb and Mean Coincident Wet Bulb values.
- In fields A13 and A14,
  1. If the airflow is verified to be 350 CFM/ton or higher there is no maximum capacity (Section 150.2(a)1Eii) and user should enter N/A.
  2. If the space conditioning system is ductless (Exception 1 to Section 150.2(a)1Eii), user should enter N/A.

01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads (See Section 150.0(h).)	
07	Outdoor Design Condition Source (See Section 150.0(h)2)		08	Cooling Outdoor Design Temperature Selected (°F)	
09	Heating Outdoor Design Temperature Selected (°F)		10	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)	
11	Calculated Dwelling Unit Heating Load (Btu/h)		12	Dwelling Unit Number of Bedrooms	
This table reports for Addition only, if project scop on the CF1R do not have Additions, then display the "section does not apply" message					
13	Maximum Heating Capacity According to Table 150.2-A (Btu/h)		14	Maximum Cooling Capacity According to Table 150.2-B (Btu/h)	
15	Envelope Leakage Specified in Load Calculation (ACH)		16	Source of Envelope Leakage Specified in Load Calculation	

**MCH-01d - Space Conditioning Systems Ducts and Fans - Performance E+A+A**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B. Design Space Conditioning (SC) System Component Specifications from CF1R**

This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11	12
SC System ID/Name from CF1R	SC System Type	Heating System Type	Cooling System Type	Central Fan Ventilation Cooling System Type	Distribution System Type	Required Thermostat Type	Cooling Zoning Type	Cooling System Compressor Speed Type	Low Leakage Air-Handling Unit Status	SC System Status	Duct System Status

Notes:

**C. Design Space Conditioning (SC) System Compliance Requirements from CF1R**

This table reports the space conditioning system features that were specified on the registered CF1R-PRF compliance document for this project.

01	02	03	04	05	06a	06	07	08	09	10	11	12
SC System ID/Name from CF1R	Heating Efficiency Type	Minimum Heating Efficiency Value	Heat Pump Heating Capacity @ 47°F	Heat Pump Heating Capacity @ 17°F	Cooling Efficiency Type	Minimum Cooling Efficiency SEER/SEER2	Minimum Cooling Efficiency EER/EER2/CEER	Minimum Cooling System Airflow Rate (CFM/ton)	Maximum SC System Fan Efficacy (W/CFM )	Modeled Duct R-Value	Central Fan Ventilation Cooling Airflow	Central Fan Ventilation Cooling Fan Efficacy

Notes:



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Installed New, Altered, and Existing Space Conditioning (SC) System Component Information**

01	02	03	04	05	06	07	08	09	10	11	12	13
SC System ID/Name from CF1R	SC System Description of Area Served	Conditioned Floor Area Served by the System (ft <sup>2</sup> )	Heating System Type	Cooling System Type	Number of Indoor Units for this System	Distribution System Type	SC System Thermostat Type	Cooling Zoning Type	Cooling System Compressor Speed Type	SC System Status	Duct System Status	Number of Ducted Indoor Units Connected to the System's Outdoor Unit
Notes:												

**E. Space Conditioning (SC) System Alteration Type Determination**

01	02	03	04	05	06	07	08	9	10	11
SC System ID/Name from CF1R	SC System Description of Area Served	Is the SC system a ducted system?	Does work include installing refrigerant containing component?	Does work include installing new SC System component?	Does work include installing more than 25 feet of ducts?	Does work include installing entirely new duct system?	Does work include installing entirely new SC system?	Alteration Type	Altered Heating Components	Altered Cooling Components
Notes:										

**F. Installed Heating System Equipment Information (not heat pumps)**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Duct Status	Heating Efficiency Type	Heating Efficiency Value (%)	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)

Notes:

**G. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Cooling Efficiency SEER/SEER2	Cooling Efficiency EER/EER2/CEER	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)	Condenser Rated Cooling Capacity (Btu/h)

Notes:

**H. Installed Split System Indoor Unit Coil or Fan Coil Equipment Information - applicable to DX or hydronic, heating or cooling, coils and fan coil units.**

Systems with more than one indoor coil or fan coil unit (e.g. multi-split systems) shall provide information for each of the system indoor unit coils or fan coil units.

01	02	03	04	05	06	07	08	09	
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Type	Indoor Unit Duct Status	Does Indoor Unit Provide CFI IAQ Ventilation?	Indoor Unit Manufacturer	Indoor Unit Model Number	Indoor Unit Serial Number	

Notes:

**I. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

01	02	03	04	05
SC System ID/Name from CF1R	SC System Description of Area Served	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number
Notes:				

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. Installed Heat Pump System – Efficiency and Performance Compliance Information**

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	System Rated Heating Capacity at 47°F	System Rated Heating Capacity at 17°F	System Rated Cooling Efficiency SEER/SEER2	System Rated Cooling Efficiency EER/EER2	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Cooling Capacity (ton)
Notes:									

**K. Altered Space Conditioning System Duct Information (<75% of duct system is altered; or duct system is not altered)**

01	02	03	04	05	06	07	08	09	10	11	12
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Were New Ducts Installed?	Required New Duct R-Value (Unconditioned Space)	Installed New Supply Duct Location	Installed New Supply Duct R-Value	Installed New Return Duct Location	Installed New Return Duct R-Value	Exception from Min R-Value	Can Approved Airflow Protocols be used to test this System?	Indoor Unit Nominal Cooling Capacity (ton)
Notes:											

**L. Installed New or Replacement Duct System Information**

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Indoor Unit Total Duct Length	Required New Duct R-Value (Unconditioned Space)	Supply Duct Location	New or Replaced Supply Duct R-Value	Return Duct Location	New or Replaced Return Duct R-Value	Exception from Min R-Value	Method of compliance with Airflow and Fan Efficacy Req's in 150.0(m)13	Number of Air Filter Devices on Indoor Unit	Can Approved Airflow Protocols be used to test this System?	Can Approved Fan Efficacy Protocol be used to test this system?	Indoor Unit Nominal Cooling Capacity (ton)
Notes:														

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****M. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near each filter grille that displays the design airflow rate for that filter grille/rack and the maximum allowed clean filter pressure drop at the design airflow rate. This will inform the occupant of the airflow vs pressure drop performance required for replacement air filters.

01	02	03	04	05	06	07	08	09	10	11	12	13
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Rack Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
Notes:												

**N. Air Filter Device Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

Mandatory Air Filter Device Requirements can be found in Section 150.0(m)12A-E. Some mandatory requirements may apply in addition to those listed below.

01	All recirculated air and all outdoor air (including make up air) supplied to the occupiable space is filtered before passing through the system's thermal conditioning components.
02	The space conditioning system shall be designed to accommodate the clean-filter pressure drop imposed by the system air filter device(s). The design airflow rate and maximum allowable clean-filter pressure drop at the design airflow rate applicable to each air filter shall be determined by the system designer. The system installer shall affix a sticker/label to each system air filter grille/rack location that discloses the filter's design airflow rate and the filter's maximum allowable clean-filter pressure drop at the design airflow rate. The sticker/label shall be permanently affixed to the air filter grille/rack, readily legible, and visible to a person replacing the air filter.
03	All system air filter devices shall be located and installed in such a manner as to allow access and regular service by the system owner.
04	The system shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50 percent in the 0.30-1.0 µm range and equal to or greater than 85 percent in the 1.0-3.0 µm range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
06	Filter racks or grilles shall use gaskets, sealing, or other means to close gaps around inserted filters and prevent air from bypassing the filter.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****O. ECC Verification Requirements for Duct Systems**

01	02	03	04	05	06	07	08	09	10	11
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Exemption from Duct Leakage Requirements	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design - Table 150.0-B or C	MCH-29 Supply Duct Surface Area R-Value Buried Ducts	MCH30 Central Fan Ventilation Cooling Credit
Notes:										

**P. ECC Verification Requirements for Space Conditioning Equipment**

01	02	03	04	05
SC System ID/Name from CF1R	SC System Description of Area Served	MCH-25 Refrigerant Charge	MCH-26 Rated SC System Equipment Verification	MCH-33 VCHP Compliance Credit
Notes:				

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Q. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

Note: Additional mandatory requirements from Section 150.0 that are not listed here may be applicable to some systems. These requirements may be applicable to only newly installed equipment or portions of the system that are altered. Existing equipment may be exempt from these requirements.

**Heating Equipment**

01	Equipment Efficiency: All heating equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
02	Controls: All unitary heating systems, including heat pumps, must be controlled by a setback thermostat. These thermostats must be capable of allowing the occupant to program the temperature set points for at least four different periods in 24 hours. See Sections 150.0(i), 110.2(c).
03	Sizing: Heating load calculations must be done on portions of the building served by new heating systems to prevent inadvertent undersizing or oversizing. See sections 150.0(h)1 and 2, and the exceptions.
04	Furnace Temperature Rise: Central forced-air heating furnace installations must be configured to operate at or below the furnace manufacturer's maximum inlet-to-outlet temperature rise specification. See Section 150.0(h)4.
05	Standby Losses and Pilot Lights: Fan-type central furnaces may not have a continuously burning pilot light. Section 110.5 and Section 110.2(d).

**Cooling Equipment**

06	Equipment Efficiency: All cooling equipment must meet the minimum efficiency requirements of Section 110.1 and Section 110.2(a) and the Appliance Efficiency Regulations.
07	Refrigerant Line Insulation: All refrigerant line insulation in split system air conditioners and heat pumps must meet the R-value and protection requirements of Section 150.0(j)1 and 2, and Section 150.0(m)9.
08	Condensing Unit Location: Condensing units shall not be placed within 5 feet of a dryer vent outlet. See Section 150.0(h)3A.
09	Liquid Line Filter Drier: A liquid line filter drier shall be installed according to the manufacturer's specifications 150.0(h)3B.
10	Sizing: Cooling load calculations must be done on portions of the building served by new cooling systems to prevent inadvertent undersizing or oversizing. See Section 150.0(h)1 and 2, and the exception.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Cooling and Heating Equipment (Additional Requirement)**

11	<b>System Selection:</b> See section 150.0(h)5 A. Equipment sizing and selection shall meet the cooling and heating loads of Section 150.0(h)1 and 2. B. Systems shall be sized based on ACCA Manual S-2023 in accordance with these requirements: i. <b>Cooling Capacity:</b> There is no limit on the minimum capacity. ii. <b>Furnaces:</b> Heating capacity shall be sized based on ACCA Manual S-2023, Table N2.5. iii. <b>Heat Pump Heating Capacity:</b> a. Minimum: Heating systems are required to have a heating capacity meeting the minimum requirements of the CBC not including any supplementary heating. b. Maximum: There is no limit on the maximum heating capacity.
12	<b>Defrost:</b> See section 150.0(h)6 and the exceptions. A. If a heat pump is equipped with an installer adjustable defrost delay timer, the delay timer shall be set to greater than or equal to 90 minutes. B. The installer shall certify on the Certificate of Installation (CF2R) that the control configuration has been tested in accordance with the testing procedure in the CF2R. <b>Exception 1 to Section 150.0(h)6.</b> Dwelling units in Climate Zones 6 and 7. <b>Exception 2 to Section 150.0(h)6.</b> Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15.
13	<b>Supplementary heating control configuration:</b> See section 150.0(h)7. Heat pumps with supplementary heat, including, but not limited to, electric resistance heaters or gas furnace supplementary heating, shall comply with the following requirements: <b>See section 150.0(h)7 for exceptions.</b> A. Lock out supplementary heating above an outdoor air temperature of no greater than 35°F. There are additional thermostat requirements in section 150.0(i)2. B. The installer shall certify on the Certificate of Installation that the control configuration has been tested in accordance with the testing procedure found in the CF2R. C. The controls may allow supplementary heater operation above 35°F only during defrost; or when the user selects emergency operation.
14	<b>Sizing of electric resistance supplementary heat:</b> See section 150.0(h)8. For heat pumps with electric resistance heating, the capacity of electric resistance heat shall not exceed the heat pump nominal cooling capacity (at 95°F ambient conditions) multiplied by 2.7 kW per ton, rounded up to the closest kW.
15	<b>Capacity variation with third-party thermostats:</b> See section 150.0(h)9 Variable or multi-speed systems shall comply with the following requirements: A. The space conditioning system and thermostat together shall be capable of responding to heating and cooling loads by modulating system compressor speed, and meet thermostat requirements in section 150.0(i)2.

**Air Distribution System Ducts, Plenums and Fans**

16	<b>Insulation:</b> The minimum duct insulation value is R-6 or ducts can be uninsulated if the duct system is located entirely in conditioned space. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1B for exceptions.
17	<b>Connections and Closures:</b> All installed air-distribution system ducts and plenums must meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****Heat Pump Thermostat**

18	A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c).
19	The thermostat shall be installed in accordance with the manufacturers published installation specifications.
20	First stage of heating shall be assigned to heat pump heating.
21	Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met.
22	Setback thermostats: All heating or cooling systems, including heat pumps, not controlled by a central energy management control system (EMCS) shall have a setback thermostat, as specified in Section 110.2(c). See Section 150.0(i)1
23	<p>Thermostats that are applied to heat pumps with supplemental heating: See Section 150.0(i)2</p> <p>The thermostats controlling heat pumps with electric resistance supplementary heat or gas furnace supplementary heat shall comply with the following requirements: See Section 150.0(i)2 for exceptions.</p> <p>A. The thermostat shall receive outdoor air temperature from an outdoor air temperature sensor or from an internet weather service.</p> <p>B. The thermostat shall display the outdoor air temperature.</p> <p>C. The thermostat and heat pump shall lock out supplementary heat when the outdoor air temperature is above 35°F.</p> <p>D. The thermostat shall have an indicator to notify when supplementary heat or emergency heat is in use.</p> <p>E. During defrost or when the user selects emergency heating, supplementary heat operation is permitted above 35°F.</p>

**Space Conditioning Load Calculations and System Capacity for Additions**

24	Minimum capacity limits and supplemental heating requirements are as described in Section 150.0(h)
25	<p>The maximum capacity depends on the relative sizes of the calculated heating design load (HL) and cooling design load (CL), the type of space conditioning system, and the duct sizing.</p> <p><b>See section 150.2(a)1Eii for exceptions</b></p> <p>a. In situations where airflow is field verified to be at least 350 cfm/ton, there is no maximum capacity limit.</p> <p>b. In situations where airflow is NOT field verified to be at least 350 cfm/ton, the system capacities shall be no larger than indicated in Table 150.2-A for heating and Table 150.2-B for cooling.</p>
26	For additions, the envelope leakage specified in the load calculation shall be no greater than the values shown in Table 150.2-C. <b>See section 150.2(a)1Eiii for exceptions</b>

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****R. Test of Defrost Delay Timer Setting**

The installing contractor shall confirm that a heat pump's installer-adjustable Defrost Delay Timer Setting (if it exists) is set to no less than 90 minutes.

01	Test Applicability. Select the statement describing test applicability for this project: 1. The test applies because the heat pump utilizes an installer adjustable Defrost Delay Timer Setting to control defrost and there are no exceptions. 2. The test does not apply because the heat pump does not utilize an installer-adjustable Defrost Delay Timer Setting to control defrost. 3. The test does not apply because Exception 1. Dwelling units in Climate Zones 6 and 7 applies. 4. The test does not apply because Exception 2 . Dwelling units with a conditioned floor area of 500 square feet or less in Climate Zones 3, 5 through 10, and 15 applies.	
02	Recording Configuration of Controls. Specify the mechanism for setting the Defrost Delay Timer Setting (for example, the name of defrost delay timer setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts Defrost Delay timer).	
03	Record the heat pump's Maximum Available Defrost Delay Timer Setting (minutes).	
04	Record where you set the Defrost Delay Timer Setting (fo example, the numeric timer setting, dip switch position, jumper configuration, or dial setting).	
05	Record where you set the Defrost Delay Timer Setting, in minutes.	
06	Confirming Configuration of Controls. If possible, the Defrost Delay Timer Setting must be 90 minutes or greater. Confirm the Defrost Delay Timer Setting is at least 90 minutes.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****S. Test of Supplementary Heating Lockout**

The installing contractor shall confirm the heat pump or thermostat is configured to lock out supplementary heating anytime the outdoor air temperature is above 35°F.

01	Test Applicability. Select the statement describing test applicability for this project: The test applies because the heating system is a heat pump with supplementary heating and there are no exceptions. The test does not apply because the heating system does not include a heat pump with auxiliary heating. The test does not apply because Exception 1. Heat pump being installed in a single family dwelling unit in Climate Zones 7 or 15. The test does not apply because Exception 2 . Heat pump being installed in a single family dwelling unit with a conditioned floor area of 500 square feet or less.	
02	If supplementary heating is electric resistance, what is its rated capacity (kW)?	
03	If supplementary heating is gas, what is its rated input capacity (kBtu/hr)?	
04	Confirming Configuration of Controls. Specify the mechanism for locking out the supplementary heating (for example, the name of supplementary heating lockout setting in the thermostat setup, or the location and number of the specific dip switch, jumper, or dial that adjusts lockout temperature). If there is no mechanism to lock out supplementary heating above a temperature no greater than 35°F this test fails.	
05	Record supplementary heating lock-out setting (for example, the numeric thermostat lock-out setpoint, dip switch position, jumper configuration, or dial setting).	
06	At what Outdoor Air Temperature (OAT) are the controls configured to begin locking out supplementary heating? If this number is above 35°F this test fails.	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

## CF2R-MCH-01d-E User Instructions

### Section A. General Information

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. When the project scope includes an addition to an existing building, the value is equal to the sum of the existing conditioned floor area plus the conditioned floor area of the addition. The default value from the CF1R-PRF may be overwritten in this document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Oversized equipment can result in reduced efficiency and capacity. Entirely new systems (see definition in Section 9.6.9 of the RCM) must be properly sized to match the heating and cooling load of the space that it serves. To do this, heating and cooling load calculations must be performed using an approved calculation methodology. These are listed here. Select the load calculation methodology used for this dwelling unit. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A. Load calculations are always recommended, especially if the loads of the house have been changed since the original equipment has been installed (reduced via weatherization, other improvements).
7. Enter the Outdoor Design Condition Source (See Section 150.0(h)2), user select from the list.
8. Enter the Cooling Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
9. Enter the Heating Outdoor Design Temperature Selected (°F) for the dwelling unit described by this document.
10. Enter the total sensible cooling load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
11. Enter the total heating load for the dwelling unit described by this document. For projects involving dwelling units with more than one system, this will be a sum of the loads for the parts of the dwelling unit served by those systems. If the project consists of a partial replacement of equipment or ducts (change-out) then load calculations are not required. Select N/A.
12. Enter the number of bedrooms in the dwelling unit. This field is filled out automatically using the default value from the CF1R-PRF for performance compliance, and is user entry for prescriptive compliance. The default value from the CF1R-PRF may be overwritten in this

document. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.

13. User select from the list or user input. If airflow is field verified to be 350 CFM/ton or higher, or if the space conditioning system is ductless, then enter N/A.
14. User input. If airflow is field verified to be 350 CFM/ton or higher, or if the space conditioning system is ductless, then enter N/A.
15. User input. Referenced from Table 152.2-C and Field Verification and Diagnostic Testing.
16. User select from the list.

### Section B. Design Space Conditioning (SC) System Component Specifications from CF1R

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
9. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
10. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
11. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.
12. This field is filled out automatically. It is determined based on entries on the Certificate of Compliance (CF1R), which must be completed prior to this document.

### Section C. Design Space Conditioning (SC) System Compliance Requirements from CF1R

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
- 6a. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
9. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
10. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
11. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
12. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.

### Section D. Installed New, Altered, and Existing Space Conditioning (SC) System Component Information

1. Select System name from the list of systems identified in previous sections and originally specified on the CF1R.
2. Briefly describe the area served by this system. Examples: entire house, upstairs, downstairs, sleeping area, north wing, etc.
3. Enter the conditioned floor area served by the system described in this row. The total value of this column for all rows must equal the total dwelling unit conditioned floor area as shown in Section A.

4. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
5. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
6. If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).
7. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
8. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
10. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
11. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
12. This field is filled out automatically. It appears in Section B and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
13. This field may be filled out automatically, otherwise enter the number of ducted indoor units connected to this system's outdoor unit. If the system is a type that does not have an outdoor unit, such as a heating-only type that uses only a furnace air-handling unit, enter 1 for the number of indoor units (The furnace air-handling unit is an indoor unit).



### Section E. Space Conditioning (SC) System Alteration Type Determination

1. SC System Identification or Name: Enter a unique identifier for this system that will readily distinguish it from other systems in the dwelling unit, such as "HVAC1," "upstairs system," etc. It is recommended to mark the system with this identifier using a permanent marker for ease of identification in the field. For single-system dwelling units, enter a simple name such as "HVAC."
2. SC System Description of Area Served: Enter a unique description of the portion of dwelling unit served by this system, such as "entire second floor," "bedroom wing," etc. For single-system dwelling units, enter a simple description such as "entire house."
3. Is the altered or installed system a ducted system? Select **"YES"** if the system has a central air handler (package or split) that is connected to one or more supply air outlets via ducting of any shape or material. Select **"NO"** for nonducted systems such as ductless mini-splits, through-the-wall systems, package terminal air conditioners, etc.
4. Altering or installing a refrigerant containing component? Select **"YES"** if the project includes installing or replacing a component that contains refrigerant; otherwise select **"NO."** Refrigerant containing components include compressors, condensing coils, evaporator coils, refrigerant metering devices or refrigerating lines.
5. Installing new components? Select **"YES"** if new HVAC components such as a packaged unit, condensing unit, cooling/heating coil, or air-handling unit (e.g. furnace), etc. are being installed in the system; otherwise select **"NO."**
6. Installing more than 25 linear feet of new or replacement ducts? This field may be filled out automatically. If required, Select **"YES"** if the project involves installing more than 25 linear feet of new or replacement ducts; otherwise select **"NO."**
7. Is the entire duct system accessible for sealing and is more than 75% of the duct system new or replaced? Select **"YES"** when, upon completion of the project, more than 75% of the ducts will be new ducts and/or replaced ducts, AND if at any time during the project all of the ducts are accessible for duct sealing; otherwise select **"NO."** "Accessible" is defined in Joint Appendix JA1 of the 2025 Reference Appendices (glossary).
8. Are all of the system's components and ducts new (entirely new system) or replaced? Select **"YES"** if the duct system meets the definition of an "Entirely New or Replacement Duct System" and all of the heating and cooling components (furnace, condenser, coil, etc.) are all new or replaced; otherwise select **"NO."**
9. Alteration Type: This field is calculated automatically based on the information entered in previous fields. Alteration types are defined in Joint Appendix JA1 of the 2025 Reference Appendices. The alteration type will determine which of the following sections are required by this document.
10. Altered Heating Components. select all that are applicable
11. Altered Cooling Components. select all that are applicable

### Section F. Installed Heating System Information (not heat pumps)

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc.

4. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes.
5. Enter the description of the duct system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length
6. This field is filled out automatically. It is referenced from the same row and column in Section C.
7. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.
9. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
10. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
11. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

#### Section G. Installed Cooling System Outdoor Unit or Package Unit Equipment Information (not heat pump)

1. This field is filled out automatically. It is referenced from the same row and column in the previous section.
2. This field is filled out automatically. It is referenced from the same row and column in the previous section.
3. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
4. Enter the certified cooling efficiency (EER/EER2/CEER) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
6. Enter the name of the *installed* Condenser or Package Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Condenser or Package Unit Serial Number as shown on the equipment nameplate.
8. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour. This information is found in the system performance information on the manufacturer's published documentation for the installed system.
9. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. This can usually be determined by the condenser model number.
10. Enter the installed Condenser Rated Cooling Capacity in BTU/h. Note that this is based on the condenser, not the coil or air handler.

#### Section H. Installed Split System Indoor Unit Coil or Fan Coil Equipment information - applicable to DX or hydronic, heating or cooling, coils or fan coil units)

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..

4. Enter the type of indoor unit or air handling unit installed by selecting one of the choices from the list.
5. Enter the description of the ducts system on this indoor unit. The possible choices are Ductless; Ducted >10ft length, Ducted ≤10ft length.
6. If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Systems that have only one indoor unit may use CFI ventilation if yes is selected in this field. Systems with more than one indoor unit connected to one outdoor unit may not select yes
7. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Manufacturer as shown on the equipment nameplate.
8. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Model Number as shown on the equipment nameplate.
9. Enter the name of the *installed* Indoor Coil or Fan Coil Unit Serial Number as shown on the equipment nameplate.

### Section I. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter the name of the *installed* Heat Pump Condenser or Package Unit Manufacturer as shown on the equipment nameplate.
4. Enter the name of the *installed* Heat Pump Condenser or Package Unit Model Number as shown on the equipment nameplate.
5. Enter the name of the *installed* Heat Pump Condenser or Package Unit Serial Number as shown on the equipment nameplate.

### Section J. Installed Heat Pump System – Efficiency and Performance Compliance Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row in Section C.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the certified heating capacity at 47F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
6. Enter the certified heating capacity at 17F of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed capacity must be greater than or equal to the required minimum capacity.
7. Enter the certified cooling efficiency (SEER/SEER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
8. Enter the certified cooling efficiency (EER/EER2) of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
9. Enter the sensible cooling capacity at design conditions of the *installed* cooling system in BTUs per hour.
10. Enter the *installed* Condenser Nominal Cooling Capacity in tons. Note that this is based on the condenser, not the coil or air handler. Can usually be determined by the condenser model number.

### Section K. Extension of Existing Duct System, Greater Than 25 Feet

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field may be filled out automatically. If required, select yes or no.
5. This field is filled out automatically.
6. Select the supply duct location from the list.
7. Enter the R-value of the installed supply ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
8. Select the return duct location from the list.
9. Enter the R-value of the installed return ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
12. If required, enter the indoor unit nominal cooling capacity, otherwise this field is not applicable.

### Section L. Installed Duct System Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. This field may be filled out automatically. If required, select the description of the duct length. Choices are >10ft and ≤10ft.
5. This field is filled out automatically.
6. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
8. This field is filled out automatically. It appears in Section B and D, and is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document. This value may be overwritten in this document but valid discrepancies with the CF1R are atypical. Overwriting the default value will automatically flag this entry and subject it to additional scrutiny by QA and enforcement personnel.
9. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in field L05. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system needs to meet minimum R-6 requirement except for portions of ducts located in conditioned space. Duct systems that are entirely in conditioned space can be uninsulated, subject to ECC verification.
11. For entirely new duct systems taking the performance credit for better than default air flow or fan efficacy, field verification of these criteria is required and this field is filled out automatically. Otherwise, the user may pick the appropriate choice. Refer to section 150.0(m)13 and Residential Compliance Manual Chapter 4.4 for more information.
12. Specify the number of air filter devices installed on this indoor unit. Air filter devices installed in completely new duct systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
13. If the system is of a type that can use one of the approved protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.
14. If the system is of a type that can use the approved protocols for testing the fan efficacy, then enter "Yes". Otherwise enter "No". Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure.
15. If required, enter the indoor unit nominal cooling capacity, otherwise this field is not applicable.

### Section M. Installed Air Filter Device Information

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2025 Standards encourages use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

### Section N. Air Filter Device Requirements

This table is a list of requirements for air filter devices.

### Section O. ECC Verification Requirements

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
6. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

7. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
8. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
9. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
10. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
11. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
12. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

#### Section P. ECC Verification Requirements for Space Conditioning Equipment

1. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
2. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
3. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
4. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.
5. This field is filled out automatically. It is calculated based on data from the CF1R and from previous sections in this document.

#### Section Q. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures

This table is a list of requirements for space conditioning systems.

#### Section S. Test of Defrost Delay Timer Setting (Section 150.0(h)6)

This table is certification requirements for Test of Defrost Delay Timer Setting

#### Section T. Test of Supplementary Heating Lockout Section 150.0(H)7

This table is certification requirements for Test of Supplementary Heating Lockout

#### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Whole House Fan (WHF) Equipment Information**

Requirements for Whole House Fans are given in Section 150.1(c)12

01	02	03	04	05	06
WHF Manufacturer Name	WHF Model Number	WHF Model Rated Airflow (CFM)	WHF Model Quantity in this Dwelling	WHF Model Total Rated Airflow (CFM)	Vent Location

**B. Whole House Fan Compliance Calculations**

01	Sum of all Installed WHF Rated Airflow in Dwelling (CFM)	
02	Sum of Airflow vented to attic	
03	Sum of Airflow vented to outside	
04	Dwelling Conditioned Floor Area (ft <sup>2</sup> )	
05	Minimum WHF Airflow Rate Requirement (CFM)	

**C. Attic Vent Free Area**

01	Required Attic Vent Free Area (ft <sup>2</sup> )	
02	Installed Attic Vent Free Area (ft <sup>2</sup> )	

**D. Compliance Statement**

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**E. Additional Requirements****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	The installed fan shall be listed in the Home Ventilating Institute (HVI) Certified Products Directory . WHF Model Rated Airflow shall be based on the value listed in HVI Directory.
02	The homeowner shall be provided with user instructions documentation that describes the proper use of the whole house fan necessary to obtain the full energy savings benefit.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-02-E User Instructions

### Section A. Whole House Fan (WHF) Equipment Information

1. Enter the name of the manufacturer of the whole house fan.
2. Enter the model number of the whole house fan
3. Enter the rated airflow in CFM of the whole house fan. Based on CFM listed in HVI Directory.
4. Enter the quantity of this exact make and model of whole house fan installed in the home. Different make/model fans will be entered on a separate row.
5. This value is calculated automatically. It is the number of this type of fan multiplied by the rated air flow of this type of fan.
6. Select from attic or outside.

### Section B. Whole House Fan Compliance Calculations

1. This field is automatically calculated. It is the sum of the rated air flows of all the installed whole house fans.
2. This field is automatically calculated. It is the sum of the rated air flows of all the installed whole house fans vented to the attic.
3. This field is automatically calculated. It is the sum of the rated air flows of all the installed whole house fans vented to the outside.
4. This field is automatically imported from the CF1R. The number used in the field equals the Conditioned Floor Area (CFA), in square feet, from the CF1R.
5. This field is automatically calculated. It is the Dwelling Conditioned floor area multiplied by 1.5 cfm/ft<sup>2</sup>.

### Section C. Attic Vent Free Area

1. This field is automatically calculated. It is the total installed whole house fan air flow vented to the attic divided by 750.
2. Enter the installed attic vent free area.

### Section D. Compliance Statement

1. To comply, the total installed whole house fan airflow must be greater than or equal to the minimum whole house fan air flow AND the installed attic net free vent area must be greater than, or equal to, the required attic net free vent area.

### Section E. Additional Requirements

1. To qualify, the installed whole house fan must be listed in the Home Ventilating Institute (HVI) Certified Products Directory, <https://www.hvi.org/hvi-certified-products-directory/>.
2. The homeowner shall be provided with user instructions documentation that describes the proper use of the whole house fan necessary to obtain the full energy savings benefit.
3. This must be a true statement to comply.

### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. System Information***Each system requiring verification must use a separate form*

01	System Name or Identification/Tag	
02	System Location or Area Served	
03	Evaporative Cooler System Type	
04	Manufacturer Name of Installed Evaporative Cooler	
05	Manufacturer Model Number of Installed Evaporative Cooler	

**B. Installation Criteria*****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Only indirect or direct/indirect systems may be installed as part of the evaporative cooling compliance option. Direct evaporative coolers do not meet the eligibility criteria.
02	Installed evaporative cooler is listed as an approved non-central air conditioner and heat pumps.
03	Equipment shall be permanently installed (no window or portable units).
04	Installation shall provide for automatic relief of supply air from the house with maximum air velocity through the relief dampers not exceeding 800 fpm (at the Title 20 rated airflow). Pressure relief dampers and ductwork shall be distributed to provide adequate airflow through all habitable rooms. For installations with an attic, ceiling dampers shall be installed to relieve air into the attic, and then to outside through attic vents. For installations without an attic, sidewall relief dampers are acceptable.
05	To minimize water consumption, bleed systems are not allowed.
06	A water quality management system (either "pump out" or conductivity sensor) is required. "Pump out" systems can either be integral to the evaporative cooler or they can be accessories that operate on a timed interval. The time interval between dumps shall be set to a minimum of six hours of cooler operation. Longer intervals are encouraged if local water quality allows.
07	The equipment manufacturer shall certify to the Energy Commission that water use does not exceed 7.5 gallons per ton hour based on the Title 20 Appliance Standards testing criteria.
08	Automatic thermostats are required. On/off control is not allowed.
09	If the evaporative cooler duct system is shared with a heating and/or cooling system, the installed duct system shall employ backdraft dampers at the evaporative cooler supply.
10	The installing contractor must provide a winter closure device that substantially blocks outdoor air from entering the indoor space.
11	The size of the water inlet connection at the evaporative cooler shall not exceed 3/8".
12	Unless prohibited by local code, the sump overflow line shall not be directly connected to a drain and shall be terminated in a location that is normally visible to the building occupants.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

**CF2R-MCH-04-E User Instructions****Section A. Evaporative Cooler Equipment Information**

1. This field is automatically imported from the CF2R-MCH-01. The number entered in the field equals evaporative cooler system name or identification/tag from the building plans.
2. This field is automatically imported from the CF2R-MCH-01. The number entered in the field equals evaporative cooler system location or the area served.
3. This field is automatically imported from the CF2R-MCH-01. Allowable values are:
  - \*evaporative - direct
  - \*evaporative - indirect
  - \*evaporative – indirect\_direct
4. Enter the Evaporative Cooler Manufacturer Name.
5. Enter the Evaporative Cooler Model Number.

**Section B. Installation Criteria**

1. This statement must be true (or not applicable) to comply.
2. This statement must be true (or not applicable) to comply.
3. This statement must be true (or not applicable) to comply.
4. This statement must be true (or not applicable) to comply.
5. This statement must be true (or not applicable) to comply.
6. This statement must be true (or not applicable) to comply.
7. This statement must be true (or not applicable) to comply.
8. This statement must be true (or not applicable) to comply.
9. This statement must be true (or not applicable) to comply.
10. This statement must be true (or not applicable) to comply.
11. This statement must be true (or not applicable) to comply.
12. This statement must be true (or not applicable) to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.



## DUCT LEAKAGE DIAGNOSTIC TEST

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

#### A. System Information

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Building Type from CF1R	
05	Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Credit from CF1R?	
06	Verified Low Leakage Air-Handling Unit Credit from CF1R?	
07	Duct System Compliance Category	
08	Any portions of Duct Located in Garage?	
09	Is the system type Small Duct High Velocity (SDHV)?	

#### B1. Duct Leakage Diagnostic Test for Completely New Duct System

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	

#### B2. Duct Leakage Diagnostic Test for Low Leakage Ducts in Conditioned Space

01	System compliance with visual inspection per RA3.1.4.1.3?	
02	Duct Leakage Test Conditions	
03	Duct Leakage Test Method	
04	Target Allowable Duct Leakage Rate (cfm)	
05	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
06	Compliance Statement:	

Registration Number: CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

Registration Date/Time:

ECC Provider:

January 1, 2026



## DUCT LEAKAGE DIAGNOSTIC TEST

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-20-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### B3. Duct Leakage Diagnostic Test for Low Leakage Air-Handling Unit (LLAHU)

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Air-Handling Unit Manufacturer Name	
13	Air-Handling Unit Model Number	
14	Compliance Statement:	

### B4. Duct Leakage Diagnostic Test for Complete Replacement or Altered Duct System

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	

**B5. Duct Leakage Diagnostic Test for Replacement or Alteration Using Smoke Test**

01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft <sup>2</sup> )	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	

**C. Ducts Located in Garage Spaces**

01	Duct Leakage Test Method	
02	Leakage Factor	
03	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
04	Measured AHU Airflow (cfm)	
05	Calculated Target Allowable Duct Leakage Rate (cfm)	
06	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
07	Compliance Statement:	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Additional Requirements for Compliance**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	System was tested in its normal operation condition. No temporary taping allowed.
02	Outside air (OA) duct connections to the central forced air duct system shall not be sealed/taped off during duct leakage testing. OA ducts used for Central Fan Integrated (CFI) Indoor Air Quality ventilation systems, or Central Fan Ventilation Cooling Systems, that utilize dampers that open only when OA is required and automatically close when OA is not required, may configure the OA damper to the closed position during duct leakage testing.
03	All supply and return register boots were sealed to the drywall.
04	Building cavities were not used as plenums, or platform returns, in lieu of ducts.
05	If cloth backed tape was used it was covered with Mastic and draw bands.
06	All connection points between the air handler and the supply and return plenums are completely sealed.
07	For completely new systems visual inspection at final construction stage: For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.
08	For completely new systems visual inspection at final construction stage: If the house rough-in duct leakage test was conducted without an air handler installed, inspect the connection points between the air handler and the supply and return plenums to verify that the connection points are properly sealed.
09	For completely new systems visual inspection at final construction stage: Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used.
10	For Duct Systems with Low Leakage Air-Handling Unit (LLAHU): The Low Leakage Air-handling Unit Model identified on this compliance document is included in the list of certified Low Leakage Air-Handling Units published on the Energy Commission Website at: <a href="https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacturing-certification-building-equipment/low">https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacturing-certification-building-equipment/low</a>
11	For Replacement or Alteration Duct Systems: If the system complies using the Smoke Test method, the smoke test was conducted in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.6. Systems that comply using the smoke test shall not be included in sample groups for ECC verification compliance.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

**CF2R-MCH-20-H User Instructions****A. System Information**

1. HVAC System Identification or Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. HVAC System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. Building Type: This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
5. Verified Low Leakage Ducts in Conditioned Space (VLLDCS): This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
6. Verified Low Leakage Air-Handling Unit (VLLAHU) Credit This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
7. Duct System Compliance Category: Choose from New, Replacement, Alteration, Replacement Using Smoke Test, Alteration Using Smoke Test.
  - a. New: Use this choice for newly constructed buildings, additions with all-new systems dedicated to the addition, or new systems installed in existing homes where the equipment is newly installed and the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material).
  - b. Replacement: For existing buildings where the equipment is not newly installed but the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material). Sometimes referred to as a "re-ducted" system.
  - c. Alteration: For existing buildings where any of the following are newly installed or replaced as part of the project and the system does not meet one of the other compliance categories:
    1. 25 feet of space-conditioning system ducts are installed in unconditioned space or indirectly conditioned space.
    2. Air conditioning or heat pump condenser
    3. Heating or cooling coil
    4. Air handler (e.g., furnace, fan coil, package unit)
  - d. Replacement using Smoke Test: Similar to "Replacement" but the target leakage could not be met due to the equipment not being new. Smoke is used to show that leaks are only coming from the previously existing equipment. All accessible leaks visible by smoke must be sealed.
  - e. Alteration using Smoke Test: Similar to "Alteration" but the target leakage could not be met due to the equipment not being new or due to inaccessible leaks. Smoke is used to show that leaks are only coming from the previously existing equipment or are inaccessible. All accessible leaks visible by smoke must be sealed.
8. Any portions of Duct Located in Garage: User select from Yes or No.

**B1. Duct Leakage Diagnostic Test for Completely New Duct System**

1. Air-Handling Unit Airflow (AHU Airflow) Determination Method: User will select from the following options:
  - a. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. Cooling System Method: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer
  - c. Heating System Method: For heating only systems the nominal air-handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. Measured Airflow Method: The measured system airflow can be used as the air-handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. Indoor Unit Method
2. Condenser Nominal Cooling Capacity (ton): Same data given on MCH-01.
3. Indoor Unit Nominal Cooling Capacity: Same data given on MCH-01.
4. Heating Capacity (kBtu/h): Same data given on MCH-01;
5. Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>): User must input CFA for the space. Should be consistent with the CF1R input value.
6. Measured AHU Airflow (CFM): If "Measured Airflow Method" is selected, user must input measured airflow.
7. Duct Leakage Test Conditions: Select from the following options:
  - a. Test Rough-in AHU: Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the 2025 Reference Appendices). In this case the air-handling unit (AHU) is installed at the time of test.
  - b. Test Rough-in No AHU: Same as "Test Rough-in" except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the 2025 Reference Appendices).
  - c. Test Final: Test conducted at "final", i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. Duct Leakage Test Method: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
9. Leakage Factor: This field is automatically filled out based on choices in previous fields.
10. Calculated Target Allowable Duct Leakage Rate (cfm): This value will be automatically calculated based on values entered in previous fields.
11. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): Input the duct leakage rater taken from actual test measurements.

12. Compliance Statement: If Actual Duct Leakage Rate from leakage test (B10) is less than or equal to Calculated Target Allowable Duct Leakage Rate, "System passes leakage test" will automatically populate. If not, "System fails leakage test" will automatically populate.

## **B2. Duct Leakage Diagnostic Test - Low Leakage Ducts in Conditioned Space**

1. System compliance with visual inspection per RA3.1.4.1.3: This field will be automatically filled. A visual inspection confirms the space conditioning system is located entirely in conditioned space in accordance with RA3.1.4.1.3. If any part of the duct system is outside of conditioned space, the system does not pass.
2. Duct Leakage Test Conditions: This field will be automatically filled. The entire duct system shall be included in the total leakage test. The air handler, supply and return plenums and all the connectors, transition pieces, duct boots and registers must be installed and tested to total system leakage. All supply registers shall be taped so that the tape goes over the grills and attaches to the surrounding drywall. All return grilles except for one large centrally located return grille or the air handler cabinet access panel shall be taped up.
3. Duct Leakage Test Method: This field will be automatically filled. Leakage to outside shall be verified by pressurizing the dwelling and the ducts to 25 Pa (0.1 inches of water) with respect to outside. A full description of these procedures can be found in RA3.1.4.3.4.
4. Target Allowable Duct Leakage Rate (cfm): This field will be automatically filled. In order to pass this test duct leakage must be equal to or less than 25 cfm when the dwelling and ducts are pressurized to 25 Pa with respect to outside.
5. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): Input the duct leakage rate taken from actual test measurements.
6. Compliance statement: This field will be automatically filled. The test passes if actual leakage rate is less than or equal to 25 cfm and a MCH-21 has been registered.

## **B3. Duct Leakage Diagnostic Test - Low Leakage Air-Handling Unit (LLAHU)**

1. Air-Handling Unit Airflow (AHU Airflow) Determination Method: User will select from the following options:
  - a. Cooling System Method: For systems with cooling, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer or the heating only value, whichever is greater (See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - b. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - c. Measured Airflow Method: The system airflow can be used as the air-handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - d. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - e. Indoor Unit Method
2. Condenser Nominal Cooling Capacity (ton): Same data given on MCH-01.
3. Indoor Unit Nominal Cooling Capacity: Same data given on MCH-01.
4. Heating Capacity (kBtu/h): Same data given on MCH-01;

5. Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>): User will input CFA for zone which should be consistent with the value from the CF1R. User will have the option to leave this field blank because the zone CFA is only required for the default airflow calculation.
6. Measured AHU Airflow (cfm): If "Measured Airflow Method" is selected, user must input measured airflow.
7. Duct Leakage Test Conditions: User must select from the following options:
  - a. Test Final: Test conducted at final inspection (testing at rough is not an option with this test. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. Duct Leakage Test Method: User will select from the following options: Total Leakage.
9. Leakage Factor: Value will be automatically populated from in CF1R.
10. Calculated Target Allowable Duct Leakage Rate (cfm): This value will be automatically populated depending on values in B06, B07, and B08.
11. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): User will input this value from actual measurements from leakage test.
12. Air-Handling Unit Manufacturer Name: This will be automatically populated from information entered in the MCH-01.
13. Air-Handling Unit Model Number: This will be automatically populated from information entered in the MCH-01.
14. Compliance Statement: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, "System passes leakage test" will automatically populate. If not, "System fails leakage test will automatically populate.

#### **B4. Duct Leakage Diagnostic Test - Complete Replacement or Altered Duct System**

1. Air-Handling Unit Airflow (AHU Airflow) Determination Method: User will select from the following options:
  - a. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. Cooling System Method: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer (Note: the heating only value may be used, if higher, See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - c. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. Measured Airflow Method: The measured system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. Indoor Unit Method
2. Condenser Nominal Cooling Capacity (ton): Same data given on MCH-01.
3. Indoor Unit Nominal Cooling Capacity: Same data given on MCH-01.
4. Heating Capacity (kBtu/h): Same data given on MCH-01.

5. Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>): User must input CFA for the space. Should be consistent with the CF1R input value.
6. Measured AHU Airflow (CFM): If “Measured Airflow Method” is selected, user must input measured airflow.
7. Duct Leakage Test Conditions: Select from the following options:
  - a. Test Rough-in AHU: Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the 2025 Reference Appendices). In this case the air handling unit (AHU) is installed at the time of test.
  - b. Test Rough-in No AHU: Same as “Test Rough-in” except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the 2025 Reference Appendices).
  - c. Test Final: Test conducted at “final”, i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. Duct Leakage Test Method: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
9. Leakage Factor: This field is automatically filled out based on choices in previous fields.
10. Calculated Target Allowable Duct Leakage Rate (cfm): This value will be automatically calculated based on values entered in previous fields.
11. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): Input the duct leakage rate taken from actual test measurements.
12. Compliance Statement: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, “System passes leakage test” will automatically populate. If not, “System fails leakage test” will automatically populate.

#### **B5. Duct Leakage Diagnostic Test - Sealing All Accessible Leaks using Smoke Test**

1. Air-Handling Unit Airflow (AHU Airflow) Determination Method: User will select from the following options:
  - a. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2025 Reference Appendices).
  - b. Cooling System Method: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer (Note: the heating only value may be used, if higher, See Section RA3.1.4.2.2 of the 2025 Reference Appendices).
  - c. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/h of rated heating output capacity.
  - d. Measured Airflow Method: The measured system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2025 Reference Appendices).
  - e. Indoor Unit Method

2. Condenser Nominal Cooling Capacity (ton): Same data given on MCH-01.
3. Indoor Unit Nominal Cooling Capacity: Same data given on MCH-01.
4. Heating Capacity (kBtu/h): Same data given on MCH-01.
5. Conditioned Floor Area Served by this HVAC System (ft<sup>2</sup>): User must input CFA for the space. Should be consistent with the CF1R input value.
6. Measured AHU Airflow (CFM): If "Measured Airflow Method" is selected, user must input measured airflow.
7. Duct Leakage Test Conditions: Select from the following options:
  - a. Test Rough-in AHU: Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the 2025 Reference Appendices). In this case the air-handling unit (AHU) is installed at the time of test.
  - b. Test Rough-in No AHU: Same as "Test Rough-in" except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the 2025 Reference Appendices).
  - c. Test Final: Test conducted at "final", i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the 2025 Reference Appendices).
8. Duct Leakage Test Method: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.1.4.3.4), or Total Leakage.
9. Leakage Factor: This field is automatically filled out based on choices in previous fields.
10. Calculated Target Allowable Duct Leakage Rate (cfm): This value will be automatically calculated based on values entered in previous fields.
11. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): Input the duct leakage rate taken from actual test measurements.
12. Compliance Statement: If Actual Duct Leakage Rate is less than or equal to Calculated Target Allowable Duct Leakage Rate, "system passes - system complies with Allowable Duct Leakage Rate Criterion" will automatically populate.

If measured leakage is greater than allowable duct leakage rate, then the following will automatically populate:

"System passes using smoke test of an altered HVAC system in an existing building

- No visible smoke exits the accessible portions of the duct system.
- Smoke is only emanating from air handler unit (AHU cabinet and non-accessible portions of the duct system.

Note: Accessible is defined as having access thereto, but which first may require removal or opening of access panels, doors, or moving similar obstructions. If access to the ducts requires an object to be demolished or deconstructed, then sealing of those ducts is not required.

### C. Ducts Located in Garage Spaces

1. Duct Leakage Test Method: This field is automatically filled out based on choices in previous fields.
2. Leakage Factor: This field is automatically filled out based on choices in previous fields.



3. Air-Handling Unit Airflow (AHU Airflow) Determination Method: This field is automatically filled out based on choices in previous fields.
4. Measured AHU Airflow (CFM): This field is automatically filled out based on choices in previous fields.
5. Calculated Target Allowable Duct Leakage Rate (cfm): This value will be automatically calculated based on values entered in previous fields
6. Actual Duct Leakage Rate from Leakage Test Measurement (cfm): This field is automatically filled out based on choices in previous fields
7. Compliance Statement: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, passes message will automatically populate. If not, "System fails leakage test" will automatically populate.

**D. Additional Requirements for Compliance**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.
9. This field must be a true statement (or not applicable) for the system to comply.
10. This field must be a true statement (or not applicable) for the system to comply.
11. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF VERIFICATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information****Note:** Submit one Installation Certificate for each duct system that is taking credit for duct location.

01	SC System Identification or Name	
02	SC System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Status – Less than 12 ft Ducts in Conditioned Space Performance Credit	
05	Status – Ducts Located In Conditioned Space Performance Credit	
06	Status – Duct System Located Entirely in Conditioned Space, No Insulation Requirement	
07	Status – Portions of Ducts Located in Conditioned Space, R-6 Exception	

**B. 12 Linear Feet or Less of Duct Located Outside of Conditioned Space - RA3.1.4.1.2****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A visual inspection shall confirm space conditioning systems with air handlers located outside the conditioned space have 12 linear feet or less of duct located outside the conditioned space including air handler and plenum.
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**C. Ducts Located In Conditioned Space - RA3.1.4.1.3****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A visual inspection shall confirm the space conditioning duct system is located entirely in conditioned space.
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**D. Duct System Located Entirely in Directly Conditioned Space, No Insulation Requirement - RA3.1.4.3.8****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A Visual Inspection Shall Confirm the Space Conditioning Distribution System Location as specified by Section RA3.1.4.1.3	
02	Actual System Duct Leakage Rate (cfm) Measured Using RA3.1.4.3.4 Duct Leakage to Outside from Fan Pressurization of Ducts	
03	Compliance Statement:	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. Portions of Ducts Located in Conditioned Space, R-6 Exception**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

The following shall be confirmed by visual inspection when applicable.

01	Portions of the duct system with no insulation (or with insulation less than minimum R-6) are located in conditioned space below the ceiling separating the occupiable space from the attic.
02	Portions of the duct system with no insulation (or with insulation less than minimum R-6 ) are located entirely inside the building's thermal envelope.
03	At all locations where portions of the duct system with no insulation (or with insulation less than minimum R-6) penetrate into unconditioned space, the penetrations are draft stopped compliant with CFC sections 703.1 and 704.1 and air-sealed to the construction materials that are penetrated, using materials compliant with CMC sections E502.4.2 to prevent air infiltration into the cavity. All connections in unconditioned space are insulated to a minimum of R-6.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-21-H User Instructions

### Section A. General Information

1. *HVAC System Identification or Name*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. *HVAC System Location or Area Served*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. *Indoor Unit Name*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. *Status – Less than 12 ft Ducts in Conditioned Space Performance Credit*: This field is automatically filled based on the information given on the CF1R. If “True” appears here, it means that this credit was taken in the performance calculations, is required for compliance and must be field verified.
5. *Status – Ducts Located in Conditioned Space Performance Credit*: This field is automatically filled based on the information given on the CF1R. If “True” appears here, it means that this credit was taken in the performance calculations, is required for compliance and must be field verified.
6. *Status – Duct Systems Located Entirely in Conditioned Space, No Insulation Requirement*– This field is automatically filled based on the information given on the CF1R. If “True” appears here, it means that the duct system is located entirely in conditioned space and is allowed to be installed with insulation less than the minimum R-Value or no insulation.
7. *Status – Portions of Ducts Located in Conditioned Space, R-6 Exception* – This field is automatically filled based on the information given on the CF1R. If “True” appears here, it means that portions of the duct system are located in conditioned space and are allowed to be installed with insulation less than the minimum R-Value or no insulation.

### Section B. 12 Linear Feet or Less of Duct Located Outside of Conditioned Space

1. This field is automatically filled.

### Section C. Ducts Located in Conditioned Space

1. This field is automatically filled.

### Section D. Duct System Located Entirely in Directly Conditioned Space, No Insulation Requirement

1. *A Visual Inspection Shall Confirm the Distribution System is in Conditioned Space*: If a visual inspection confirms that the ducts are entirely within directly conditioned space, then select “entirely in directly conditioned space”, otherwise select “not entirely in directly conditioned space”. The latter selection means that the system does not meet the requirements and the CF1R will have to be revised or the system will need to be modified such that the ducts are located entirely within directly conditioned space.
2. *Actual System Duct Leakage Rate (cfm) Measured using RA3.1.4.3.4 Duct Leakage to Outside from Fan Pressurization of Ducts*: Enter the measured duct leakage rate (cfm) using the procedures found in RA3.1.4.3.4.
3. *Compliance Statement*: This field is automatically filled.

### Section E. Portions of Ducts Located in Conditioned Space, R-6 Exception

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.

CERTIFICATE OF INSTALLATION – USER INSTRUCTION	CF2R-MCH-21-H
Duct Location	(Page 2 of 2)

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Ducted Cooling System Information**

01	System Identification or Name	
02	System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	System Installation Type	
05	Nominal Cooling Capacity (tons) of Condenser	
06	Condenser Speed Type	
07	Cooling System Zonal Control Type	
08	Central Fan Integrated (CFI) Ventilation System Status	
09	System Bypass Duct Status	
10	Date of System Airflow Rate Measurement	
11	Airflow Rate Protocol Utilized	
12	Central Fan Ventilation Cooling System Status	

**B. Fan Watt Measurement Apparatus and Procedure Information**

*Instrument Specifications are given in RA3.3.1, and system fan watt measurement apparatus information is given in RA3.3.2.2.*

01	Fan Watt Verification Device Used	
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**C1. Forced Air System Fan Efficacy Measurement**

*Complete this section with Fan Efficacy Measurement Data for Newly Installed Non-Zoned Systems or Zoned Multi-Speed Compressor*

*The procedures for System Fan Watt Verification are specified in Reference Residential Appendix RA3.3.*

01	Actual Tested Watts	
02	Actual Tested Airflow from MCH-23 (cfm)	
03	Required Fan Efficacy (watts/cfm)	
04	Actual Fan Efficacy (watts/cfm)	
05	Compliance Statement:	

**C2. Forced Air System Fan Efficacy Measurement – All Zones Calling**

*Complete this section with Fan Efficacy Measurement Data for Newly Installed Zoned Single-Speed Compressor Systems*

*The procedures for System Fan Watt Verification are specified in Reference Residential Appendix RA3.3.*

01	Actual Tested Watts	
02	Actual Tested Airflow from MCH-23 (cfm)	
03	Required Fan Efficacy (watts/cfm)	
04	Actual Fan Efficacy (watts/cfm)	
05	Compliance Statement:	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Forced Air System Fan Efficacy Measurement – All Zonal Control Modes**

The procedures for System Fan Efficacy Verification are specified in Reference Residential Appendix RA3.3. Note: For compliance with verification in all zonal control modes, it is sufficient to verify fan efficacy for operation of each individual zone when the individual zone is the sole zone calling for conditioning. It is not necessary to verify fan efficacy for combinations of 2 or more zones that are less than all zones calling (e.g., 2 out of three zones calling).

01	Number of Independently Controlled Zones (i.e., number of thermostats or temperature sensors that independently control one or more dampers.)				
02	Required Fan Efficacy in All Zonal Control Modes(Watt/cfm)				
03	04	05	06	07	08
Zone Name	Zone Description	Measured Watt Draw with all Other Zones Off	Measured Airflow with all Other Zones Off (cfm)	Calculated Fan Efficacy (Watts/cfm)	Zone Compliance Status
09	Compliance Statement:				

**E. Central Fan Ventilation Cooling System Fan Efficacy Measurement**

The procedures for Central Fan Ventilation Cooling System Fan Watt Verification are specified in Reference Residential Appendix RA3.3.4.

01	Actual Tested Watts	
02	Actual Tested Ventilation Airflow from MCH-23 (cfm)	
03	Required Fan Efficacy (watts/cfm)	
04	Actual Fan Efficacy (watts/cfm)	
05	Compliance Statement:	

**F. Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	All registers were fully open during the diagnostic test.
02	System fan was set at maximum speed during the diagnostic test.
03	If fresh air duct is part of the HVAC system it was not closed during the diagnostic test.
04	Airflow rate and fan watt draw shall be simultaneous measurements when used to calculate the fan efficacy tested value.
05	Multi-speed compressor space cooling systems or variable speed compressor systems with controls that vary fan speed subject to the number of zones, as certified by the installer may verify airflow (cfm/ton) and fan efficacy (watt/cfm) with system operating at maximum compressor capacity and system fan speed with all zones calling for conditioning.
06	Zoned cooling air distribution systems with single speed compressors shall meet both the airflow (cfm/ton) and fan efficacy (watt/cfm) criteria in every zonal control mode.
07	Portable watt meters used for measurements of air-handler watt draws shall be true power measurement systems (i.e., sensor plus data acquisition system) having an accuracy of $\pm 2\%$ of reading or $\pm 10$ watts whichever is greater.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-22-H User Instructions

### Section A. Ducted Cooling System Information

1. System Identification or Name: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
4. System Installation Type: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
5. Nominal Cooling Capacity (tons) of Condenser: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
6. Condenser Speed Type: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
7. Cooling System Zonal Control Type: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
8. Central Fan Integrated (CFI) Ventilation System Status: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
9. System Bypass Duct Status: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
10. Date of System Airflow Rate Measurement: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
11. Airflow Rate Protocol utilized: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
12. Central Fan Ventilation Cooling System Status: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.

### Section B. Fan Watt Measurement Apparatus and Procedure Information

1. Fan Watt Verification Device Used: If the device used to measure fan watts was a portable watt meter then select “Portable Watt Meter”. This can include plug-in devices such as a “Watts-Up” meter, or a “Kill-a-Watt” meter, or a clamp-on type meter that reads true power watts directly (must account for power factor – multiplying amps x volts is not adequate).

### Section C1. Forced Air System Fan Efficacy Measurement

(This section title is for systems that are Non-Zoned or have Zoned Multi-Speed Compressor) and

### Section C2. Forced Air System Fan Efficacy Measurement – All Zones Calling

(This section title is for zonally controlled systems) Both C1 and C2 have the same fields and instructions:

1. Actual Tested Watts: Enter the number of watts tested using the device specified in Section B and tested with all zones calling for cooling simultaneously.
2. Actual Tested Airflow from MCH-23 (cfm): This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
3. Required Fan Efficacy (watts/cfm): This field is filled out automatically and referenced from MCH-01. Values below are used unless higher efficacy values are listed on the CF1R for performance compliance.
  - a. 0.62 watts/cfm for small duct high velocity HP or AC systems

- b. 0.45 watts/cfm for central gas furnace or packaged gas furnace systems
- c. 0.58 watts/cfm for all other systems
- 4. Actual Fan Efficacy (watts/cfm): This field is filled out automatically. It is calculated by dividing the actual tested watts by the actual tested airflow.
- 5. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy.

#### **D. Forced Air System Fan Efficacy Measurement – All Zonal Control Modes**

(This section is required for zonally controlled systems)

- 1. Number of Independently Controlled Zones: Enter the number of independently controlled zones.
- 2. Required Fan Efficacy (Watts/cfm): This field is filled out automatically and referenced from MCH-01. Values below are used unless higher efficacy values are listed on the CF1R for performance compliance.
  - a. 0.62 watt/cfm for small duct high velocity HP or AC systems
  - b. 0.45 watt/cfm for central gas furnace or packaged gas furnace systems
  - c. 0.58 watt/cfm for all other systems
- 3. Zone Name: Enter a unique name for each independent zone.
- 4. Zone Description: Enter a description of the zone (e.g. upstairs, downstairs).
- 5. Measured Watt Draw with All Other Zones Off: Enter the number of watts tested using the device specified in Section B and tested with all other zones off.
- 6. Measured Airflow with All Other Zones Off: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
- 7. Calculated Fan Efficacy: This field is filled out automatically. It is calculated by dividing the measured watt draw by the measured airflow.
- 8. Zone Compliance Status: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy for this zone.
- 9. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy for all zones tested.

#### **Section E. Central Fan Ventilation Cooling System Fan Efficacy Measurement**

(This section is required if project includes a CFVCS system)

- 1. Actual Tested Watts: Enter the number of watts tested using the device specified in Section B and tested at ventilation cooling airflow rate.
- 2. Actual Tested Ventilation Airflow from MCH-23: This field is filled out automatically. It is referenced from the CF2R-MCH-23, which must be completed prior to this document.
- 3. Required Fan Efficacy: This field is filled out automatically and referenced from MCH-01. Values below are used unless higher efficacy values are listed on the CF1R for performance compliance.
  - a. 0.62 watt/cfm for small duct high velocity HP or AC systems
  - b. 0.45 watt/cfm for central gas furnace or packaged gas furnace systems
  - c. 0.58 watt/cfm for all other systems
- 4. Actual Fan Efficacy: This field is filled out automatically. This is calculated by dividing the measured watt draw by the measured airflow.
- 5. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual fan efficacy meets the required fan efficacy for all zones tested.

**Section F. Additional Requirements**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Ducted Cooling System Information**

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Description of Area Served	
03	Indoor Unit Name	
04	System Installation Type	
05	Nominal Cooling Capacity (tons)	
06	Condenser Speed Type	
07	Cooling System Zonal Control Type	
08	Central Fan Integrated (CFI) Ventilation System Status	
09	System Bypass Duct Status	
10	Date of System Airflow Rate Measurement	
11	Airflow Rate Protocol Utilized	
12	Central Fan Ventilation Cooling System Status	

**B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

Procedures for installing HSPP or PSPP are specified in RA3.3.1.1

01	Method Used to Demonstrate Compliance with the HSPP/PSPP Requirement	
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**C. Airflow Rate Measurement Apparatus and Procedure Information**

Instrument Specifications are given in RA3.3.1.1, and system airflow rate measurement apparatus information is given in RA3.3.2.

01	Airflow Rate Measurement Type Used for this Airflow Rate Verification	
02	Manufacturer of Airflow Measurement Apparatus	
03	Model number of Airflow Measurement Apparatus	
04	Certification Status of the Airflow Measurement Apparatus Accuracy	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

The installer shall attempt to correct non-compliant system airflow rates by performing the following remedial actions as specified in RA3.3.3.1.5

01	Determine that the air filter media is clean. If the air filter media is dirty, then replace it with clean filter media.	
02	Open all registers and dampers and remove any obstructions.	
03	Replace/Repair all accessible crushed, blocked, restricted, remove excess length, and sharp bends in ducts. Supported every 4 ft max. with a max. 2 in sag.	
08	Clean the evaporator coil according to the manufacturer and ensure the coil is not obstructed.	
05	Air handler fan speed set to high and blower wheel and motor are operating properly.	
06	If determined to be too small, replace the return duct with a larger one and/or add a second return duct.	
07	If determined to be too small, replace the return grille with a larger area grille.	
08	If any of the above were not completed list the Action Required and a description of why the action could not be completed:	

**E1. Forced Air System Airflow Rate Measurement**

*Complete this section with Airflow Rate Measurement Data for Newly Installed Non-Zoned Systems or Zoned Multi-Speed Compressor*

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required Minimum System Airflow Rate (cfm/ton)	
03	Required Minimum System Airflow Target (cfm)	
04	Compliance Statement:	

**E2. Forced Air System Airflow Rate Measurement - All Zones Calling**

*Complete this section with Airflow Rate Measurement Data for Newly Installed Zoned Single-Speed Compressor Systems*

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required All Zones Calling Minimum System Airflow Rate (cfm/ton)	
03	Required All Zones Calling Minimum System Airflow Target (cfm)	
04	Compliance Statement:	

**E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable**

*Complete this section with Airflow Rate Measurement Data for Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems*

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3

01	Actual System Airflow Rate Measurement (cfm)	
02	Required Minimum System Airflow Rate (cfm/ton)	
03	Required Minimum System Airflow Target (cfm)	
04	Compliance Statement:	
05	ECC Sample Group Eligibility	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E4. Forced Air System Airflow Rate Measurement – Heating Only**

Complete this section with Airflow Rate Measurement Data for Newly Installed Heating Only Non-Zoned Systems or Zoned Multi-Speed Compressor Measurement Only – No Minimum Target Requirement

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3.

01	Actual System Airflow Rate Measurement (cfm)	
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**F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes**

The procedures for System Airflow Rate Verification are specified in Reference Residential Appendix RA3.3. For compliance with verification in all zonal control modes, it is sufficient to verify airflow rate for operation of each individual zone when the individual zone is the sole zone calling for conditioning. It is not necessary to verify airflow rate for combinations of 2 or more zones that are less than all zones calling (e.g., 2 out of three zones calling).

01	Number of Independently Controlled Zones (i.e., number of thermostats or temperature sensors that independently control one or more dampers.)			
02	Required Minimum Cooling System Airflow Rate (cfm/ton)			
03	Required Minimum Airflow in all Zonal Control Modes (cfm)			
04		05	06	07
Zone Name		Zone Description	Measured Airflow with All Other Zones Off (CFM)	Zone Compliance Status
08	Compliance Statement:			

**G. Central Fan Ventilation Cooling System Airflow Rate Measurement**

The procedures for central fan ventilation cooling system airflow rate verification are specified in Reference Residential Appendix RA3.3.4

01	Required Ventilation System Airflow Rate (cfm)	
02	Actual System Ventilation Airflow Rate Measurement (cfm)	
03	Compliance Statement:	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Air filters that meet the applicable requirements of Standards Section 150.0(m)12 or 150.0(m)13 were properly installed in the system during system airflow rate measurement identified on this Certificate of Installation.
02	The airflow rate measurement apparatus used to perform the airflow rate measurement identified on this Certificate of Installation was calibrated in accordance with the apparatus manufacturer's specifications and conforms to the instrumentation specifications given in RA3.3.1.
03	A visual inspection shall confirm that bypass ducts that deliver conditioned supply air directly to the space conditioning system return duct airflow are not used on newly constructed zonally controlled systems unless the Performance Certificate of Compliance indicates an allowance for use of a bypass duct. When a bypass duct is accounted for on the Performance Certificate of Compliance, the airflow rate shall conform to the specifications listed on the Certificate of Compliance.
04	All registers were fully open during the diagnostic test.
05	System fan was set at maximum speed during the diagnostic test.
06	If fresh air duct is part of the HVAC system it was not closed during the diagnostic test.
07	Airflow rate and fan watt draw shall be simultaneous measurements when used to calculate the Fan Efficacy tested value.
08	Multi-speed compressor space cooling systems or variable speed compressor systems with controls that vary fan speed subject to the number of zones, as certified by the installer may verify airflow (cfm/ton) and fan efficacy (Watt/cfm) with system operating at maximum compressor capacity and system fan speed with all zones calling for conditioning.
09	For altered systems that do not comply with the minimum 300 cfm per ton airflow rate requirement but opt to comply using the remedial actions on this MCH-23 compliance document according to Section RA3.3.3.1.5, the system's thermostat shall conform to the specifications in Reference Joint Appendix JA5 and shall be capable of receiving and responding to Demand Response Signals prior to final approval of the building permit by the enforcing agency (Section 150.2(b)1Fiiia).



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-23-H User Instructions

### Section A. Ducted Cooling System Information

- 1 System Identification or Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 2 System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 3 Indoor Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 4 System Installation Type: Select the appropriate System Installation Type from the following choices:
  - a. New: Use this choice for newly constructed buildings, additions with all-new systems dedicated to the addition, or new systems installed in existing homes where the equipment and ducts are all newly installed (aka, "Cut-in").
  - b. Replacement: Use this choice if the system is a complete replacement space-conditioning system installed as part of an alteration, and includes all the system heating or cooling equipment plus a replacement duct system (150.2(b)1Diia) where the ducts are at least 75% or more newly installed duct material (up to 25% of the finished system may consist of reused parts from the dwelling unit's previously existing duct system, such as registers, grilles, boots, air handler, coil, plenums, duct material); plus a replacement air handler.
  - c. Alteration: Use this choice for existing buildings where any of the following are newly installed or replaced as part of the project and the system does not meet one of the other compliance categories above.:
    - i. 25 feet or more of space-conditioning system ducts are installed in unconditioned space or indirectly conditioned space.
    - ii. Air conditioning or heat pump condenser
    - iii. Heating or cooling coil
    - iv. Air handler (e.g., furnace, fan coil, package unit)
- 5 Nominal Cooling Capacity (tons): This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document. If the number of indoor units connected to the outdoor unit is equal to one or the system is a packaged system then this field is equal to the nominal cooling capacity of the condenser. If the number of indoor units connected to the outdoor unit is greater than one this field is equal to the indoor unit nominal cooling capacity.
- 6 Condenser Speed Type: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 7 Cooling System Zonal Control Type: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 8 Central Fan Integrated (CFI) Ventilation System Status: If the system has Central Fan Integrated System, then select "CFI System", otherwise select "Not a CFI system".
- 9 System Bypass Duct Status: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 10 Date of System Airflow Rate Measurement: Enter the date that the airflow test was performed.
- 11 Airflow Rate Protocol Utilized: If the system installation type is "New" or "Replacement" then only the RA3.3 airflow methods may be used. If the system installation type is "Alteration", the RA3.3 airflow methods may be used, but the Alternative to Compliance with Minimum System Airflow Requirements ("Best I Can Do" Airflow) is an option for existing systems that may require substantial modification to improve the airflow.

- 12 Central Fan Ventilation Cooling System (CFVCS) Status: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.

### Section B. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum

1. A hole for a static pressure probe (HSPP) or a permanent static pressure probe (PSPP) is required when system airflow verification is required, whether the airflow test method used requires one or not. Select the appropriate choice from the following options using a dropdown box, the Static Pressure Measurement Method:
  - a. If an Hole Static Pressure Probe is installed then select “HSPP Installed”
  - b. If a Permanent Static Pressure Probe is installed then select “PSPP Installed”
  - c. If the system is configured such that an HSPP nor PSPP can be installed, an alternate location that provides access for making supply plenum pressure measurement may be used. Select “An alternative location has been provided and clearly labeled.”
  - d. If the system is such that an HSPP or PSPP is not applicable, select “HSPP/PSPP are not applicable to this system”.

### Section C. Airflow Rate Measurement Apparatus and Procedure Information

1. Airflow Rate Measurement Type Used for this Airflow Rate Verification: Select the appropriate airflow test procedure from the following options for the method used to determine actual fan airflow:
  - a. Diagnostic Fan Flow Using Fan Flow Meter (aka Plenum Pressure Matching) according to the procedures in RA3.3.3.1.1
  - b. Diagnostic Fan Flow Using Flow Grid Measurement according to the procedures in RA3.3.3.1.2
  - c. Diagnostic Fan Flow Using Powered Flow Capture Hood according to the procedures in RA3.3.3.1.3
  - d. Diagnostic Fan Flow Using Traditional Flow Capture Hood according to the procedures in RA3.3.3.1.4
2. Manufacturer of Airflow Measurement Apparatus: Enter the name of the manufacturer of the airflow measurement tool used to measure the airflow for this test.
3. Model number of Airflow Measurement Apparatus: Enter the model number of the airflow measurement tool used to measure the airflow for this test.
4. Certification Status of the Airflow Measurement Apparatus Accuracy: The measurement apparatus used to perform an airflow verification measurements must appear on the CEC list of approved devices found at [http://www.energy.ca.gov/title24/equipment\\_cert/ama\\_fas/index.html](http://www.energy.ca.gov/title24/equipment_cert/ama_fas/index.html), if this is true, select “Certified”, otherwise select “Not Certified”. The latter choice will not allow the system to pass until a certified device is used.

### Section D. Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems

(This section is required for altered systems using alternative compliance)

These fields are required for alteration project compliance

1. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
2. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
3. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
4. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
5. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
6. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.
7. Refer to section RA3.3.3. for details on this item. Indicate whether completed or not.

8. If any of the above items could not be completed due to inaccessibility or significant cost, provide an explanation here.

**Section E1. Forced Air System Airflow Rate Measurement** (This section is required for non-zoned systems or zoned systems with multi-speed systems)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the CF2R-MCH-01.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

**Section E2. Forced Air System Airflow Rate Measurement – All Zones Calling**

(This section is required if system is zonally controlled)

1. Required All Zones Calling Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the CF2R-MCH-01.
2. Required All Zones Calling Minimum System Airflow target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target.

**Section E3. Forced Air System Airflow Rate Measurement - Best Airflow Rate Attainable** (This section is required for altered systems using alternative compliance)

1. Required Minimum System Airflow Rate (cfm/ton): This field is filled automatically. The target is always 300 cfm/ton for this option.
2. Required Minimum System Airflow Target (cfm): This field is calculated automatically. It is the product of the minimum airflow rate per ton and the tonnage of the system condenser.
3. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
4. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the minimum airflow target, however if the criteria of RA3.3.3 is met the best attainable airflow rate will suffice.
5. ECC Sample Group Eligibility: This field is filled out automatically. If the minimum airflow rate cannot be met and the criteria of RA3.3.3 is used, the system cannot be included in a ECC sample group.

**Section E4. Forced Air System Airflow Rate Measurement** (This section is required if system is heating only)

1. Actual System Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.

**Section F. Forced Air System Airflow Rate Measurement – All Other Zonal Control Modes**

(This section is required for systems with single speed compressor and zonally controlled).

1. Number of Independently Controlled Zones: Enter the number of zones in this system that are independently controlled, i.e., that can call for cooling while other zones can be fully or mostly shut off from system airflow. This usually corresponds to the number of thermostats or zone sensors.
2. Required Minimum Cooling System Airflow Rate (cfm/ton): This field is filled automatically. The target is based on whether the system is new or altered and whether a value was specified on the CF2R-MCH-01.
3. Required Minimum Airflow in all Zonal Control Modes (cfm): This field is filled out automatically. If a value other than 350 cfm was claimed in the performance calculations, it will be referenced from the CF1R, otherwise the target is 350 cfm.
4. Zone Name: Enter a unique name for each zone on this system. Examples: Zone 1, Z1, Zone A, etc.
5. Zone Description: Enter a brief description of each zone that is detailed enough allow someone to distinguish it from the others in the field. Examples: upstairs, first floor, east wing, bedrooms only, (list rooms served), etc.
6. Measured Airflow with All Other Zones Off: This test must be performed with only one independently controlled zone calling for cooling (Note: if fan watt verification is required, it must be performed simultaneously to the corresponding airflow from this test). All other zones must not be calling during this test. The zone dampers for the other zones must be in their normal closed position. Enter the airflow value measured for the zone that is calling. This test must be performed for each and every independently controlled zone.
7. Zone Compliance Status: This field is filled out automatically. The result is based on whether or not the actual airflow meets the required airflow for this zone.
8. Compliance Statement: This field is filled out automatically. The result is based on whether or not the actual airflow meets the required airflow for all zones

### Section G. Central Fan Ventilation Cooling System Airflow Rate Measurement

(This section is required if project has a fixed or variable CFVCS. )

1. Required Ventilation System Airflow Rate (cfm): This field is filled automatically. The target is based on the airflow rate specified on the CF2R-MCH-01.
2. Actual System Ventilation Airflow Rate Measurement (cfm): Enter the actual tested value of the airflow measured using the apparatus specified above.
3. Compliance Statement: This field is filled automatically. Compliance requires that the measured airflow meets the airflow target.

### Section H. Additional Requirements

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.
9. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**BUILDING AIR LEAKAGE DIAGNOSTIC TEST WORKSHEET**  
**BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES****SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Enclosure Air Leakage – General Information**

01	Test Procedure used	
02	Date of the Diagnostic Test for this Dwelling	
03	Is ECC verification of building enclosure air leakage to outside required by MCH-27?	
04	Default Enclosure Air Leakage	
05	Indoor temperature during test (°F)	
06	Outdoor temperature during test (°F)	
07	Blower Door Location	
08	Building Elevation Above Sea Level (ft)	
09	Dwelling Unit Volume	

**B. Diagnostic Equipment Information**

01	Number of Manometers Used to Measure Home Pressurization			
02	03	04	05	06
Manometer Make	Manometer Model	Manometer Serial Number	Manometer Calibration Date	Manometer Calibration Status
07	Number of Fans Used to Pressurize Home			
08	09	10	11	
Fan Make	Fan Model	Fan Serial Number	Fan Configuration (rings)	

**C1. Enclosure Air Leakage Diagnostic Test for a Single-Point Test with Manual Meter**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure Difference (Pa) Goal = 50 ± 3 or -50 ± 3 (Pressurization is positive; Depressurization is negative)	
07	Induced Enclosure Pressure Check	
08	Measured Nominal Fan Flow at Above Fan Pressure (cfm) at the Induced Enclosure Pressure Difference (in C06 above)	
09	Calculated Nominal CFM50	

**BUILDING AIR LEAKAGE DIAGNOSTIC TEST WORKSHEET  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES****SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C2. Enclosure Air Leakage Diagnostic Test for Single Point Air Tightness Test with Automatic Meter**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Induced Enclosure Pressure from Manometer (Pa) Goal = $50 \pm 3$ or $-50 \pm 3$ (Pressurization is positive; Depressurization is negative)	
05	Induced Enclosure Pressure Check	
06	Nominal CFM50	

**C3. Enclosure Air Leakage Diagnostic Test for a Multi-Point Test**

01	Time Average Period of Meter (seconds)	
02	Test Methodology	
03	Pre-Test Baseline Enclosure Pressure (Pa) (May be positive or negative)	
04	Unadjusted Enclosure Pressure Target (Pa)	
05	Unadjusted Enclosure Pressure Measured (Pa) (Pressurization is positive; Depressurization is negative)	
06	Induced Enclosure Pressure from Manometer (Pa) Goal = $60 \pm 3$ or $-60 \pm 3$ (Pressurization is positive; Depressurization is negative)	
07	A minimum of five readings were taken spaced evenly between 10 Pa and 60 Pa (or highest attainable pressure)	
08	Post-Test Baseline Enclosure Pressure (Pa)	
09	Name and Version of ASTM E779 Compliant Software used for Multi-Point Test	
10	Corrected Nominal CFM50 (from software)	

**D1. Altitude and Temperature Correction for a Single-Point Test Data**

01	Altitude and Temperature Correction Factor	
02	Corrected CFM50	
03	ACH50	

**D2. Altitude and Temperature Correction for Multi-Point Test Data**

Performed by blower door software For Multi-Point Test		
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**E1. Accuracy Adjustment for Single-Point Test Data**

01	Adjusted CFM50 (measured air leakage rate)	
----	--	--

**E2. Accuracy Adjustment for Multi-Point Test Data**

01	Percent Uncertainty @ 95% Confidence Level (from software)	
02	Accuracy Level	
03	Accuracy Adjustment Factor	
04	Adjusted CFM50 (measured air leakage rate)	

**F. Measured Enclosure Air Leakage Rate**

01	
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**BUILDING AIR LEAKAGE DIAGNOSTIC TEST WORKSHEET  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES*****SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS*****G. Additional Requirements for Worksheet Compliance**

01	The procedure for preparing the enclosure for testing is detailed in RESNET 380-2019 Section 4.2.
02	The procedure for installation of the test apparatus, and preparations for measurement shall conform to RESNET 380-2019 Section 4.3
03	The procedure for the conduct of the enclosure air leakage test shall conform to the One-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.1
04	The procedure for the conduct of the enclosure air leakage test shall conform to the Multi-Point Airtightness Test specified in RESNET 380-2019 Section 4.4.2

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

**BUILDING AIR LEAKAGE DIAGNOSTIC TEST WORKSHEET  
BUILDING ENCLOSURES AND DWELLING UNIT ENCLOSURES****SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

**CF2R-MCH-24-H User Instructions****Section A. Enclosure Air Leakage – General Information**

1. Select the appropriate test procedure. This selection will determine what sections are required in this report. Not that newer manometers have automatic functions for compensating baseline (automatic baseline) and compensating for house pressures other than the target (50 Pa). It is preferable to use these when available.
2. Enter the date that the enclosure air leakage test data was collected.
3. This field is automatically filled from the MCH-27 which determines if a  $2ACH_{50}$  value is required.
4. This field displays the  $2ACH_{50}$  default enclosure air leakage.
5. Enter the indoor temperature measured at the time that the enclosure air leakage test was performed.
6. Enter the outdoor temperature measured at the time that the enclosure air leakage test was performed.
7. Provide a brief description of the location where the blower door was installed for the test. Examples: "front entry door on west side of house", "door between house and garage", "large window in family room".
8. Enter the building elevation above sea level. Use the value for the closest city found in Joint Appendix JA2.2.
9. This field is automatically calculated unless the CF1R is an NCB or ADD.

**Section B. Diagnostic Equipment Information**

1. Enter the number of manometers used to measure the enclosure pressurization. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
2. Enter the make (brand) of the manometer used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
3. Enter the model of the manometer used to collect the enclosure air leakage data. Examples: DM-2 Mark II, DG700.
4. Enter the serial number of the manometer used to collect the enclosure air leakage data.
5. Enter the most recent date that the manometer was calibrated by following manufacturer's calibration specifications.
6. This field is automatically filled. If the calibration date was more than 12 months prior to the test date entered in Row A02 above, an error will appear.
7. Enter the number of blower door fan systems required to run simultaneously to pressurize the enclosure for the enclosure air leakage test. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
8. Enter the make (brand) of the fan used to collect the enclosure air leakage data. Examples: Retrotec, Energy Conservatory.
9. Enter the model of the fan used to collect the enclosure air leakage data. Examples: US1000, Q46, BD3, BD4.
10. Enter the serial number of the fan used to collect the enclosure air leakage data.
11. Enter the fan configuration shown on the meter. This is sometimes referred to as "range configuration", "CONFIG" or "rings". Examples: Open, A, B, C8.

**Section C1. Enclosure Air Leakage Test** (This section is required if A01 test procedure is single point manual)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.

2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $50 \pm 3$  Pa.
7. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
8. Enter the measured nominal fan flow at above fan pressure from the manometer that corresponds to the induced enclosure pressure difference.
9. This field is automatically calculated. The induced enclosure pressure difference is converted to a nominal airflow at 50 Pa.

**Section C2. Enclosure Air Leakage Test** (This section is required if A01 test procedure is single point automatic)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. Enter the induced enclosure pressure from the automatic manometer. The goal is to achieve  $50 \pm 3$  Pa.
5. This field is automatically calculated. This field determines if the pressure achieved is acceptable to proceed with the enclosure air leakage test.
6. Enter the measured nominal CFM50 from the automatic manometer.

**Section C3. Enclosure Air Leakage Test** (This section is required if A01 test procedure is multi-point)

1. Enter the Time Average Period used on the manometer during the test. Must be at least 10 seconds.
2. Select the type of test being performed: Pressurization (air blowing into house) or depressurization (air blowing out of house).
3. Enter the pre-test baseline enclosure pressure. This is the reading on the manual manometer with no fans turned on.
4. This field is automatically calculated. This is the enclosure pressure target value the enclosure needs to achieve during the test.
5. Enter the unadjusted enclosure pressure measured. This value is read from the manual manometer during the test.
6. This field is automatically calculated. This value is the difference of the unadjusted enclosure pressure measured and the pre-test baseline enclosure pressure. The goal is to achieve  $50 \pm 3$  Pa.
7. When using the software for a multi-point test, a minimum of five measures must be taken over a range of pressures. This is where the user acknowledges that this was done.
8. Enter the Post Test Baseline Enclosure Pressure from the manometer
9. Multi-Point procedure requires use of an ASTM E779-19 compliant software, typically provided by the blower door manufacturer. Confirm with the software vendor that it is compliant. Enter the name and version here.
10. Enter the final Corrected CFM50 reading from the software.

**Section D1. Altitude and Temperature Correction** (This section is required if A01 test procedure is single point manual or automatic)

1. This field is automatically calculated. This factor is determined based on the altitude and temperature of the building location using equation 4 in Section 9 of ASTM E779-10.
2. This field is automatically calculated. The corrected CFM50 is the nominal CFM50 from Section C multiplied by the altitude and temperature correction factor.

**Section D2. Altitude and Temperature Correction** (If A01 test procedure is multi-point corrections are performed by the blower door software)

**Section E1. Accuracy Adjustment** (This section is required if A01 test procedure is single point manual or automatic)

1. This field is automatically calculated. This value is determined from equation 5a from ANSI/RESNET/ICC 380-2016.

**Section E2. Accuracy Adjustment** (This section is required if A01 test procedure is multi-point

1. The software will provide a "Percent Uncertainty" value based on the readings taken. Enter that value here
2. This field is automatically calculated. If the Percent Uncertainty level is 10% or less, the Accuracy Level is "Standard". If the Percent Uncertainty level is greater than 10%, the Accuracy Level is "Reduced".
3. This field is automatically calculated:
  - a. If the Accuracy Level is "Standard", the Accuracy Adjustment Factor will be 1 (no adjustment)
  - b. If the Accuracy Level is "Reduced", the Accuracy Adjustment Factor will be adjusted by the Percent Uncertainty.
4. This field is automatically calculated. The Adjusted CFM50 is the Corrected CFM50 multiplied by the Accuracy Adjustment Factor.

**Section F. Measured Enclosure Air Leakage Rate**

1. This field is automatically calculated. A check is performed to make sure that the meter has been properly calibrated.

**Section G. Additional Requirements for Worksheet Compliance**

1. This statement must be true (or not applicable) for the test to conform to the protocols.
2. This statement must be true (or not applicable) for the test to conform to the protocols.
3. This statement must be true (or not applicable) for the test to conform to the protocols.
4. This statement must be true (or not applicable) for the test to conform to the protocols.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. System Information**

Each system requiring refrigerant charge verification will be documented on a separate certificate.

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Location or Area Served	
03	Condenser (or package unit) Make or Brand	
04	Condenser (or package unit) Model Number	
05	Nominal Cooling Capacity (tons) of Condenser	
06	Condenser (or package unit) Serial Number	
07	Refrigerant Type	
08	Other Refrigerant Type (if applicable)	
09	Liquid Line Filter Drier Installed According to Manufacturer's Specifications (if applicable)	
10	System Installation Type	
11	Fault Indicator Display (FID) Status (Note: Even systems with a FID must have refrigerant charge verified by installer)	
12	Is the system of a type that the minimum airflow can be verified for all indoor units using an approved measurement procedure (RA3.3 or RA3.3.3)?	
13	Is the system of a type that approved refrigerant charge verification procedures can be used to verify compliance with the refrigerant charge verification requirements when temperatures are $\geq 55^{\circ}\text{F}$ (RA3.2.2, or RA1)?	
14	Date of Refrigerant Charge Verification for this System	
15	Refrigerant Charge Verification Method Used	
16	Person Who Performed the Refrigerant Charge Verification Reported on this Certificate of Installation	
17	ECC Verification Compliance Requirement Status	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****B1. Metering Device Verification**

Superheat Method can only be used on systems that do not have a variable metering device.

01	Refrigerant Metering Device	
02	Superheat Method Applicability Status	

**B2. Metering Device Verification**

Subcooling Method can only be used on systems that have a variable metering device.

01	Refrigerant Metering Device	
02	Subcooling Method Applicability Status	

**C. Instrument Calibration**

Procedures for instrument calibration are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2

01	Date of Digital Refrigerant Gauge Calibration	
02	Date of Digital Thermocouple Calibration	
03	Digital Refrigerant Gauge Calibration Status	
04	Digital Thermocouple Calibration Status	

**D. Measurement Access Hole (MAH) Verification**

Procedures for installing MAH are specified in Reference Residential Appendix RA3.2.2.3

01	Method Used to Demonstrate Compliance with the Measurement Access Hole (MAH) Requirement	
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**E. Minimum System Airflow Rate Verification**

Procedures for verifying minimum system airflow are specified in Reference Residential Appendix RA3.3.3.

01		02	03
Indoor Unit Name or Description of Area Served		Minimum Required System Airflow Rate (cfm)	System Airflow Rate Verification Status
04	Compliance Statement:		
Notes:			

**F1. Data Collection for Superheat Method**

Procedures for determining Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2 and RA3.2.2.2

01	Lowest Return Air Dry-bulb Temperature that Occurred During the Refrigerant Charge Verification Procedure (°F)	
02	Measured Condenser Air Entering Dry-bulb Temperature ( $T_{\text{condenser, db}}$ ) (°F)	
03	Outdoor Temperature Qualification Status	
04	Measured Return (evaporator entering) Air Dry-bulb Temperature ( $T_{\text{return, db}}$ ) (°F)	
05	Measured Return (evaporator entering) Air Wet-bulb Temperature ( $T_{\text{return, wb}}$ ) (°F)	
06	Measured Suction Line Temperature ( $T_{\text{suction}}$ ) (°F)	
07	Measured Suction Line Pressure ( $P_{\text{suction}}$ - psig)	
08	Evaporator Saturation Temperature ( $T_{\text{evaporator, sat}}$ ) from Digital Gauge or P-T Table using Line F07 (°F)	
09	Measured Superheat (Line F06 – Line F08) (°F)	
10	Target Superheat (from Table RA3.2-2, using F02 and F05) (°F)	
11	Compliance Statement:	

**F2. Data Collection and Calculations for Subcooling Method**

Procedures for determining Refrigerant Charge using the Standard Charge Verification Procedure are given in Reference Residential Appendix RA3.2.2

01	Lowest Return Air Dry-bulb Temperature that Occurred During the Refrigerant Charge Verification Procedure (°F)	
02	Measured Condenser Air Entering Dry-bulb Temperature ( $T_{\text{condenser, db}}$ )	
03	Outdoor Temperature Qualification Status	
04	Measured Liquid Line Temperature ( $T_{\text{liquid}}$ ) (°F)	
05	Measured Liquid Line Pressure ( $P_{\text{liquid}}$ ) (psig)	
06	Condenser Saturation Temperature ( $T_{\text{condensor, sat}}$ ) from Digital Gauge or P-T Table using Line F05 (°F)	
07	Measured Subcooling (Line F06 – Line F04) (°F)	
08	Target Subcooling from Manufacturer (°F)	
09	Compliance Statement:	



**G. Metering Device Verification for Subcooling Method**

Procedures for the verification of proper metering device operation are specified in RA3.2.2.6.2

01	Measured Suction Line Temperature ( $T_{\text{suction}}$ ) (°F)	
02	Measured Suction Line Pressure ( $P_{\text{suction}}$ ) (psig)	
03	Evaporator Saturation Temperature ( $T_{\text{evaporator, sat}}$ ) from Digital Gauge or P-T Table using line G02 (°F)	
04	Measured Superheat (Line G01 – Line G03) (°F)	
05	Measured Superheat (Line G04) is between 4°F and 25°F (inclusive)	
06	Measured Superheat (Line G04) is within Manufacturer's Specifications (if known)	
07	Compliance Statement:	

**H. Weigh In Charge Procedure**

Procedures for Refrigerant Charge using the Weigh-in Charging Procedure are given in Reference Residential Appendix RA3.2.2.2 and RA3.2.3

01	Measured Condenser Air Entering Dry-bulb Temperature ( $T_{\text{condenser, db}}$ ) (°F)	
02	Specify the Method of Weigh-in	
03	Manufacturer's Standard Charge for Condenser (lbs, oz.)	
04	Manufacturer's Standard Liquid Line Length (ft)	
05	Manufacturer's Standard Liquid Line Diameter (in)	
06	Manufacturer's Standard Indoor Coil Size (tons)	
07	Installed Liquid Line Length (ft)	
08	Installed Liquid Line Diameter (in)	
09	Installed Indoor Coil Size (tons)	
10	Charge Adjustment to Standard Charge from Manufacturer's Specifications (ounces, positive = add, negative = remove)	
11	Refrigerant Required to be Weighed in by the Installer (lbs, oz)	
12	Refrigerant Weighed in by Installer (lbs, oz)	
13	Compliance Statement:	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****I. Weigh In Charge Procedure – Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	If refrigerant line connections require welding, the system is braised with dry nitrogen in the lines and indoor coil.
02	<ul style="list-style-type: none"><li>i. In all cases where the OEM instructions call for checking for gas leaks with vacuum, prior to introducing refrigerant, system is evacuated to 500 microns or less and, when isolated, has risen no more than 300 microns after 5 minutes.</li><li>ii. In all cases where the OEM instructions call for checking for gas leaks with nitrogen gas, the system was pressurized to the manufacturer's specified pressure and if the pressure could not be maintained, leaks were located and fixed.</li></ul>
03	Observation and documentation of the vacuum and pressurization tests are not required if no fittings (other than the fitting to the compressor) are compression or flare fittings.
04	The calculated weight adjustment for lineset length is based on the length and diameter of the lineset.
05	The calculated weight adjustment for coil size is based on manufacturer instructions.
06	The actual total weight adjustment is equal to the sum of the calculated weight adjustments for lineset and coil size.
07	The calculated and actual total weights of refrigerant in the system are recorded on or near the nameplate label, in indelible ink or other permanent means.
08	When applicable and if necessary to avoid delay of approval of dwelling units completed when outside temperatures are below 55°F, the enforcement agency may approve compliance with the refrigerant charge verification requirements based on registration of this CF2R-MCH-25, documenting use of the RA3.2.3.1 HVAC Installer Weigh-In Charging Procedure when the optional Section RA3.2.3.2 ECC Rater Observation of Weigh-In Charging Procedure is not used. As condition for such enforcement agency approval, the responsible person's signature on this compliance document affirms the installer agrees to return to correct refrigerant charge if a ECC Rater determines at a later time, when the outside temperature is 55°F or greater, that refrigerant charge correction is necessary.

**J. Verification of New Package Unit Factory Charge**

Note: There is no ECC verification requirement for New Package Unit Factory Charge. The Enforcement Agency has responsibility for this verification.

01	The responsible person's signature on this document affirms that this new package unit has correct refrigerant charge as provided by the manufacturer prior to shipment from the factory, and no modifications have been made to this packaged unit that would result in a change to the amount of refrigerant in the unit.
----	---

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-25-H User Instructions

### Section A. System Information

1. This information is automatically pulled from the Certificate of Installation (MCH-01).
2. This information is automatically pulled from the Certificate of Installation (MCH-01).
3. This information is automatically pulled from the Certificate of Installation (MCH-01).
4. This information is automatically pulled from the Certificate of Installation (MCH-01).
5. This information is automatically pulled from the Certificate of Installation (MCH-01).
6. This information is automatically pulled from the Certificate of Installation (MCH-01).
7. Choose the type of refrigerant used by the system being verified. R-454, R-22 and R-410A are the most common, but other types may occasionally be encountered.
8. If "Other" is chosen in A07, then indicate the type of refrigerant being used. Documentation of refrigerant may be requested.
9. If applicable, a liquid line filter drier shall be installed according to the manufacturer's specifications.
10. Indicate whether the HVAC system is Completely New, Replacement or an Alteration. These are defined in detail the Residential Compliance Manual.
11. N/A
12. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. Selecting "No" here may subject the project to additional scrutiny by enforcement personnel.
13. Most ducted split systems and package systems are of the type that approved refrigerant charge verification procedures detailed in Residential Appendix RA3.2.2 or RA1 can be used (i.e., Standard Charge Verification procedures). Examples of systems that may not meet this description are "mini splits" or variable refrigerant flow systems that may only be charged using weigh-in procedures. Selecting "No" here may subject the project to additional scrutiny.
14. Specify the date the refrigerant charge verification was performed by the installer.
15. Select the refrigerant charge verification method used from the choices provided:
  - Superheat (outdoor temperature must be  $\geq 55^{\circ}\text{F}$ ); this verification method can only be used when the outdoor temperature is at or above  $55^{\circ}\text{F}$ . It is only used on systems with fixed orifice refrigerant metering devices (non-variable metering devices). This method is detailed in Reference Appendix RA3.2.2.6.1. Systems verified using this method may be eligible for ECC verification compliance using Group Sampling.
  - Subcooling (outdoor temperature must be  $\geq 55^{\circ}\text{F}$ ); this verification method can only be used when the outdoor temperature is at or above  $55^{\circ}\text{F}$ . It is only used on systems with variable metering devices (TXV or EXV). This method is detailed in Reference Appendix RA3.2.2.6.2. Systems verified using this method may be eligible for ECC verification compliance using Group Sampling.
  - Weigh-in; this verification method can be used at any outdoor temperature allowed by the equipment manufacturer. This method is detailed in Reference Appendix RA3.2.3. Systems verified using this method are NOT eligible for ECC verification compliance using Group Sampling.
  - New Package Unit Factory Charge; Choose this option when a new package unit is being installed that has an AHRI rating. This helps ensure that the unit was properly charged at the factory. ECC verification of refrigerant charge may not be required in this case.
16. Identify who will be performing the verification that is documented on this Certificate of Installation, select from the two options. Note that ECC verification compliance by Group Sampling requires that the installer perform their own refrigerant charge verification as part of the installation of the

equipment prior to the system being put into a sample group for possible selection by a ECC rater for verification. If Group Sampling is not intended, the ECC Rater may perform the refrigerant charge verification on behalf of the Installing Contractor (applies to any method but Weigh-In) and the Rater will enter same results on both the CF2R and CF3R.

17. The Group Sampling status is automatically displayed based on the input results of A15 and A16. Group Sampling procedures are detailed Residential Appendix RA2.6.3.

### Section B1 and B2. Metering Device Verification

(This section is required if A15 equals Superheat – B1 Or Subcooling – B2)

1. Select the correct metering device used on the system being verified. This will check against the refrigerant charge verification method selected in A15. An error message will appear in B02 if the wrong verification method has been selected. Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV).
2. An error message here indicates that the wrong verification method may have been selected. Superheat verification can only be used on systems with fixed orifice and Subcool verification can only be used on systems with variable metering devices (TXV or EXV).

### Section C. Instrument Calibration

(This section is required for all verification methods selected in A15 except New Package Unit Factory Charge)

1. Enter the date of most recent Digital Refrigerant Gauge Calibration Field Check. Analog gauges are not allowed for verification purposes under the 2025 Standards. Specification for pressure gauges is found in Residential Appendix RA3.2.2.2.3. Procedures for the field check procedure are detailed in RA3.2.2.4.2. Calibration field check must happen at least once every 30 days.
2. Enter the date of the most recent Digital Thermocouple Calibration. Specifications for thermocouples and temperature sensors can be found in Residential Appendix RA3.2.2.2.2. Procedures for calibration are detailed in RA3.2.2.4.1. Calibration must happen at least once every 30 days.
3. Digital Refrigerant Gauge Calibration status will appear automatically. If the date entered in C01 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.
4. Digital Thermocouple Calibration status will appear automatically. If the date entered in C02 is more than 30 days prior to date of verification this row will indicate that calibration is required and you will not be allowed to continue filling out this document until calibration is performed.

### Section D. Measurement Access Hole (MAH) Verification

1. Indicate the method used to demonstrate compliance with the MAH requirement by selecting the appropriate method from the drop down list. Procedures for installing MAH's are detailed in RA3.2.2.3. Selecting that the MAH cannot be installed consistent with Figure 3.2-1 may result in additional scrutiny by enforcement personnel. For Weigh-in verification methods only If A12 = NO, then system is exempt from the MAH requirement and a special message will show up here.

### Section E. Minimum System Airflow Rate Verification

1. This information is automatically calculated based on the information given in A10. This is the target minimum system airflow required for the system being verified.
2. This information is automatically calculated based on the MCH-23 or MCH-28, which documents the measured airflow (or alternative method) of the system being verified. If the measured airflow is not adequate it will not comply with the airflow requirements and refrigerant charge verification cannot be performed until the airflow meets the requirement. For Weigh-in verification methods only If A12 = NO, then system is exempt from the airflow rate requirement and a special message will show up here.

### Section F1. Superheat Charge Verification Method – Data Collection

(This section is required if A15 equals Superheat)

1. Measure and record the lowest return air dry-bulb temperature that occurred during the refrigerant charge procedure in degrees F. This temperature must remain above 70°F during the verification procedure. This requirement is detailed in Residential Appendix RA3.2.2.5.
2. Measure and record the condenser air dry-bulb temperature ( $T_{\text{condenser}}$ ) in degrees F. This value is used to determine the target superheat from table RA3.2-2. This value must be at least 55°F and no more than 115°F to use the Superheat Charge Verification Method.
3. If a value less than 55°F or greater than 115°F is entered in F02 the Superheat Method cannot be used.
4. Measure and record the return air dry-bulb temperature ( $T_{\text{return,db}}$ ) in °F. This measurement is taken at the MAH (or alternate location specified in F01. This procedure is detailed in RA3.2.2.5.
5. Measure and record the return air wet-bulb temperature ( $T_{\text{return,wb}}$ ) in °F. This measurement is taken at the MAH (or alternate location specified in F01. This procedure is detailed in RA3.2.2.5. This value is used to determine the target superheat from table RA3.2-2.
6. Measure and record the suction line temperature ( $T_{\text{suction}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured superheat.
7. Measure and record the suction line pressure ( $P_{\text{suction}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into F08.
8. Enter the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the suction line pressure entered in F07, in °F.
9. Measured superheat is automatically calculated as the difference between the suction line temperature (F06) and the evaporator saturation temperature (F08)
10. Enter target superheat from Table RA3.2-2. This table requires values for the condenser air dry-bulb temperature (F02) and the return air wet-bulb temperature (F05)
11. System passes superheat method when F10 is within plus or minus 5°F of F09.

### Section F2. Subcooling Charge Verification Method – Data Collection

(This section is required if A15 equals Subcooling)

1. Measure and record the lowest return air dry-bulb temperature that occurred during the refrigerant charge procedure in °F. This temperature must remain above 70°F during the verification procedure. This requirement is detailed in Residential Appendix RA3.2.2.5.
2. Measure and record the condenser air dry-bulb temperature ( $T_{\text{condenser}}$ ) in °F. This value must be at least 55°F and no more than 115°F to use the Subcooling Charge Verification Method.
3. If a value less than 55°F or greater than 115°F is entered in F02 the Subcooling Method cannot be used.
4. Measure and record the liquid line temperature ( $T_{\text{liquid}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured subcool temperature.

5. Measure and record the liquid line pressure ( $P_{\text{liquid}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the condenser saturation temperature ( $T_{\text{condenser,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into F06.
6. Enter the condenser saturation temperature ( $T_{\text{condenser,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the liquid line pressure entered in F05, in °F.
7. Measured Subcooling is automatically calculated as the difference between the liquid line temperature (F04) and the condenser saturation temperature (F06)
8. Enter target subcooling from manufacturer. This may be a challenge to find for older equipment. Internet searches can sometimes result in archived equipment specifications for the equipment in question, or sometimes a very similar model. If the manufacturer's target cannot be found the Commission's Executive Director may provide additional guidance for compliance.
9. System passes Subcooling method when F08 is within plus or minus 3°F of F07.

### Section G. Metering Device Verification for Subcooling Method

(This section is required if A15 equals Subcooling)

1. Measure and record the suction line temperature ( $T_{\text{suction}}$ ) in °F. This procedure is detailed in RA3.2.2.5. This value is used to calculate the measured superheat.
2. Measure and record the suction line pressure ( $P_{\text{suction}}$ ) in psig. This procedure is detailed in RA3.2.2.5. This value is used to determine the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from a pressure temperature chart for the appropriate refrigerant (can be internal to a digital gauge), which is entered into G03.
3. Enter the evaporator saturation temperature ( $T_{\text{evaporator,sat}}$ ) from the digital gauge or a separate pressure-temperature chart that corresponds to the suction line pressure entered in G02, in °F.
4. Measured superheat is automatically calculated as the difference between the suction line temperature (G01) and the evaporator saturation temperature (G03)
5. There are two possible criteria for passing. If the manufacturer's specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. This row checks the CEC requirement.
6. If the manufacturer's target superheat for ensuring proper metering device operation is known, it supersedes the CEC requirement of being between 4°F and 25°F. If "Yes, documentation to be provided upon request." is selected, the installer should be prepared to provide documentation for the target values used.
7. There are two possible criteria for passing. If the manufacturer's specification is known it should be used, otherwise the CEC requirement is that the superheat be between 4°F and 25°F, inclusive. If "Yes, documentation to be provided upon request." is selected in G06, the installer should be prepared to provide documentation for the target values used.

### Section H. Weigh In Charge Procedure

(This section is required if A15 equals Weigh-in with installer Or Weigh-in with ECC Rater observation)

1. Measure and record the outside air dry-bulb temperature in °F. This will affect the procedures that may be used for ECC verification. If the installer opts to use the weigh-in method when the outside air dry-bulb temperature is above 55°F, ECC verification may only utilize the standard charge procedure (super heat or subcool) if the system is conducive to that procedure.
2. Specify the method of weigh-in. There are two options that may be used. One is to add or remove a small, weighed portion of refrigerant from a factory charged unit (Charge Adjustment). The other is to weigh the entire charge of refrigerant before introducing it into the system (Total Charge). Select

either one. Note: The amount of refrigerant in systems that are not newly installed cannot be assumed to be the factory charge. Altered systems using existing refrigerant must use the Total Charge method. Only new, factory installed equipment can utilize the Charge Adjustment method.

3. Enter the Manufacturer's Standard Charge for condenser in pounds and ounces. This is the amount of refrigerant that the manufacturer specifies for a "standard" installation (typical coil match, typical line set size and length). For the Charge Adjustment method, this is the amount of refrigerant that factory charges the system to. Be prepared to provide manufacturer's documentation to support this value.
4. The Manufacturer's Standard Charge, specified in H03 is based on a standard liquid line length, typically 25 feet. Enter the value here, in feet. Be prepared to provide manufacturer's documentation to support this value.
5. The Manufacturer's Standard Charge, specified in H03 is based on a standard liquid line diameter. Enter the value here, in inches (for example: 1/4", 3/8", etc.). Be prepared to provide manufacturer's documentation to support this value.
6. The Manufacturer's Standard Charge, specified in H03 is based on a standard indoor (evaporator) coil size. Enter the value here, in tons. Be prepared to provide manufacturer's documentation to support this value.
7. Enter the length of the liquid line installed on the system being verified, in feet. This value must be compared to the standard liquid line length entered in H04 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
8. Enter the diameter of the liquid line installed on the system being verified, in inches (for example: 1/4", 3/8", etc.). This value must be compared to the standard liquid line diameter entered in H05 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
9. Enter the size of the indoor (evaporator) coil installed on the system being verified, in tons. This value must be compared to the standard coil size entered in H06 and used to determine if the Manufacturer's Standard Charge entered in H03 is appropriate.
10. Enter the Charge Adjustment to Standard Charge, in ounces. This is the amount of refrigerant that the manufacturer specifies to add to, or remove from, the Manufacturer's Standard Charge entered in H03. This value must come from manufacturer's specifications using the standard values entered in H04 through H06 to the installed values entered in H07 through H09. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. Be prepared to provide manufacturer's documentation to support this value.
11. This value is calculated automatically. If "Charge Adjustment" was specified in H02, then the value shown here will be the same as the value shown in H10. This is the amount of weighed refrigerant that will be added or removed from the factory charged unit. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed, this value should be a negative number. If "Total Charge" was specified in H02, then the value shown here will be the value in H03 added to the value in H10. This is the total amount of refrigerant that will be in the system, all of which must be weighed before introducing into the system.
12. Enter the amount of refrigerant weighed and added to, or removed from, system. If refrigerant is to be added, this value should be a positive number. If refrigerant is to be removed from a factory charged system, this value should be a negative number. This value must match the value in H11 for the system to pass.
13. If the value in H11 equals the value in H12, a statement will appear here indicating that the system passes the weigh-in method. Otherwise, a statement will appear here indicating that the system does not pass.



## Section I. Weigh-In Charge Verification – Additional Requirements

(This section is required if A15 equals Weigh-in with installer Or Weigh-in with ECC Rater observation)

1. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. If refrigerant line connections require welding, the requirement for brazing lines charged with dry nitrogen is specified in Residential Appendix RA3.2.3.1.5.
2. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The requirement for checking refrigerant lines for leaks with nitrogen gas by pressurized to the manufacturer's specified pressure and if the pressure cannot be maintained, leaks shall be located and fixed is specified in Residential Appendix RA3.2.3.1.5.
3. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The requirement for checking refrigerant lines for leaks by evacuating to 500 microns or less and rising by no more than 300 microns after 5 minutes is specified in Residential Appendix RA3.2.3.1.5.
4. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. Observation and documentation of the vacuum and pressurization tests are not required if no fittings (other than the fitting to the compressor) are compression or flare fittings is specified in Residential Appendix RA3.2.3.1.5.
5. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated weight adjustment for lineset length is based on the length and diameter of the lineset is specified in Residential Appendix RA3.2.3.1.5.
6. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated weight adjustment for coil size is based on manufacturer instructions is specified in Residential Appendix RA3.2.3.1.5.
7. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The actual total weight adjustment is equal to the sum of the calculated weight adjustments for lineset and coil size is specified in Residential Appendix RA3.2.3.1.5.
8. Additional requirements are items that must be done, but are not specifically required to be checked by the ECC rater. By signing the Declaration Statement on this document, the installer is declaring that all of these additional requirements have been met. The calculated and actual total weights of refrigerant in the system are recorded on or near the nameplate label, in indelible ink or other permanent means is specified in Residential Appendix RA3.2.3.1.5.

## Section J. Verification of New Package Unit Factory Charge

(This section is required if A15 is New Package Unit Factory Charge)

1. By signing the Declaration Statement at the bottom of this form, the installer is declaring that the package unit was an AHRI certified unit and that no modifications were made to the unit to change the factory charge.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. System Information***Procedures for verification of High SEER2 and EER2 Equipment are described in Reference Appendix RA3.4.**Each HVAC system requiring verification must use a separate form.*

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Description of Area Served	
03a	Efficiency Metric	
03	Status: SEER/SEER2 Performance Compliance Credit Check	
04	Status: EER/EER2 Performance Compliance Credit Check	
05	Status: Heat Pump Heating Output Performance Compliance Check	
06	Status: HSPF/HSPF2 Performance Compliance Credit Check	
07	Directory Used to Certify Product Performance	
08	AHRI Certification Number for the Installed Space Conditioning System from <a href="http://www.ahridirectory.org">http://www.ahridirectory.org</a>	
09	Does the directory used to certify product performance require a specific air handler, furnace or fan coil make and model?	
10	Does the directory used to certify product performance require a time delay relay (+TDR)?	
11	Does the directory used to certify product performance require a TXV (+TXV)?	

**B. Rated Space Conditioning System Equipment Information from Nameplate of the Installed System***The data on the nameplate of the installed component shall conform to the data for the component as shown in the Directory used to certify product performance in order to demonstrate compliance.*

01	02	03	04	Data from nameplate of the installed system component					
				05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Installed Indoor Unit Type	Outdoor Condenser or Package Unit – Installed Manufacturer Name	Outdoor Condenser or Package Unit - Installed Model Number	Indoor Unit – Installed Manufacturer Name	Indoor Unit - Installed Model Number	Installed Furnace Manufacturer Name	Installed Furnace Model Number

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Rated Space Conditioning System Equipment Information from Directory of Certified Product Performance**

The data on the nameplate of the installed component shall conform to the data for the component as shown in the Directory used to certify product performance in order to demonstrate compliance.

01	02	03	04	Data from the directory used to certify product performance for the rated system component					
				05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	Installed Indoor Unit Type	Outdoor Condenser or Package Unit – Installed Manufacturer Name	Outdoor Condenser or Package Unit - Installed Model Number	Indoor Unit – Installed Manufacturer Name	Indoor Unit - Installed Model Number	Installed Furnace Manufacturer Name	Installed Furnace Model Number

**D. Verified Cooling System SEER/SEER2**

Signature by responsible person on this compliance document certifies that the installed cooling equipment meets or exceeds the required value listed on the CF1R.

01	Required Minimum SEER/SEER2	
02	Installed SEER/SEER2	
03	Compliance Statement:	

**E. Verified Cooling System EER/EER2**

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

01	Required Minimum EER/EER2	
02	Installed EER/EER2	
03	Compliance Statement:	

**F. Verified Heat Pump Heating Output**

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

01	Required Heating BTU Output at 47 Degrees F	
02	Installed Heating BTU Output at 47 Degrees F	
03	Required Heating Output at 17 Degrees F	
04	Installed Heating Output at 17 Degrees F	
05	Compliance Statement:	

**G. Verified Heat Pump HSPF2**

Signature by responsible person on this compliance document certifies that the installed heat pump equipment meets or exceeds the required value listed on the CF1R.

01	Required Minimum HSPF/HSPF2	
02	Installed HSPF/HSPF2	
03	Compliance Statement:	



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**H. Verified Space Conditioning System Air Handler, Furnace or Fan Coil**

01	If a specific air handler, furnace or fan coil is required by the directory used to certify product performance, the responsible person certifies by signing this compliance document that the installed air handler/furnace matches the equipment specified by the Directory of Certified Performance.
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**I. Verified Space Conditioning System Time Delay Relay**

01	If a Time Delay Relay is specified by the Directory of Certified Product Performance, the responsible person certifies by signing this compliance document that the Time Delay Relay is installed and has been tested to operate correctly according to the protocols of RA3.4.3.
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**J. Verified Space Conditioning System TXV**

01	If a TXV is specified by the Directory of Certified Product Performance, the responsible person certifies by signing this compliance document that the TXV is properly installed and has been visually verified, including proper placement of the sensing bulb.
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FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-26-H User Instructions

### Section A. System Information

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
- 3a. Efficiency Metric: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. Status: SEER2 performance compliance credit check: This field is filled out automatically. It is referenced from the CF1R.
4. Status: EER2 performance compliance credit check: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
5. Status: Heat Pump Heating Output Performance Compliance Check: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
6. Status: HSPF2 performance compliance credit check: This field is filled out automatically. It is referenced from the CF1R.
7. Directory Used to Certify Product Performance: User to select from dropdown list the certification database used to document equipment efficiency. Choices are AHRI, CEC and DOE.
8. AHRI Certification Number for the Installed Space Conditioning System: If the directory used is not AHRI, "N/A" will automatically be entered. Otherwise, enter the complete AHRI Certification Number for the Installed Space Conditioning System. This number represents a specific piece of equipment (e.g., package units) or combination of equipment (e.g., split systems) that must match the installed equipment.
9. Does the directory used to certify product performance require a specific air handler, furnace or fan coil make and model?: If not using AHRI, user has the option to select "N/A." Note that when using AHRI, this does not apply to package units. Sometimes, for split systems, a specific model air handler/furnace will be called out in addition to the condenser and coil. When it is, it must be installed and verified for the AHRI certificate to be valid for the installed system. Sometimes, the AHRI certificate only calls out the condenser and coil model numbers. In this case the furnace make/model need not be verified. If not, select "No".
10. Does the directory used to certify product performance require a time delay relay (+TDR)?: If not using AHRI, user has the option to select "N/A." If the AHRI certificate specifies that a TDR was on the system when it was tested, then the TDR is required for the system to achieve its certified efficiency and it must be verified. If not, select "No". The indication for a TDR usually consists of a "+TDR" at the end of the model number. Sometimes it may just be a "+D" (delay).
11. Does the directory used to certify product performance require a TXV (+TXV)?: If not using AHRI, user has the option to select "N/A." If the AHRI certificate specifies that a TXV was on the system when it was tested, then the TXV is required for the system to achieve its certified efficiency and it must be verified. If not, select "No". The indication for a TXV usually consists of a "+TXV" at the end of the model number. Sometimes it may just be a "+V" (valve).

### Section B. Rated Space Conditioning System Equipment Verification from Nameplate

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. Indoor unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.

4. Installed indoor unit type is automatically filled out.
5. Outdoor Condenser or Package Unit - Installed Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
6. Outdoor Condenser or Package Unit - Installed Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
7. Indoor Coil - Installed Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
8. Indoor Coil - Installed Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document. For systems where there is no separate inside coil “N/A” will be automatically entered.
9. Installed Furnace Manufacturer Name, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
10. Installed Furnace Model Number, Data from Nameplate of Installed system component: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.

### Section C. Rated Space Conditioning System Equipment Verification from Directory

1. System Name or Identification/Tag: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. Indoor unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. Installed indoor unit type is automatically filled out
5. Outdoor Condenser or Package Unit - Installed Manufacturer Name, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s name for the condenser as it appears in the Directory. For Package units, this will be the only Manufacturer’s name.
6. Outdoor Condenser or Package Unit - Installed Model Number, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s model number for the condenser as it appears in the Directory. For Package units, this will be the only model number required.
7. Indoor Coil - Installed Manufacturer Name, Data from the Directory used to certify product performance for the rated system component: Enter the Manufacturer’s name for the inside coil (aka, indoor coil, evaporator coil) as it appears in the Directory. For system types that don’t have separate inside coils or if the directory rating does not include this information, like package units, fan coil units and multi-split variable capacity heat pumps, user may enter “N/A”.
8. Indoor Coil - Installed Model Number, Data from the Directory used to certify the rated system component: Enter the Manufacturer’s model number for the inside coil (aka, indoor coil, evaporator coil) as it appears in the Directory. For system types that don’t have separate inside coils or if the directory rating does not include this information (package units, fan coil units, multi-split variable capacity heat pumps), user may enter “N/A”.
9. Installed Furnace Manufacturer Name, Data from the directory used to certify product performance for the rated system component: If not using AHRI, user has the option to select “N/A.” Enter the Manufacturer’s name for the air handler/furnace as it appears in the directory. For package units there is



no separate air handler, so enter “N/A”. Also enter “N/A” if a specific furnace or air handler is not called out in the directory, as indicated in Section A, above.

10. Installed Furnace Model Number, Data from the directory used to certify product performance for the rated system component: If not using AHRI, user has the option to select “N/A”. Enter the Manufacturer’s model number for the air handler/furnace as it appears in the directory. For package units there is no separate air handler, so enter “N/A”. Also enter “N/A” if a specific furnace or air handler is not called out in the directory, as indicated in Section A, above.

#### Section D. Verified Cooling System SEER2

1. Required Minimum SEER2: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. Installed SEER2: Enter the exact SEER2 value shown in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed SEER2 meet the required minimum SEER2.

#### Section E. Verified Cooling System EER2

1. Required Minimum EER2: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. Installed EER2: Enter the exact EER2 value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed EER2 meet the required minimum EER2.

#### Section F. Verified Heat Pump Heating Output

1. Required Heating BTU Output at 47 Degrees F: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. Installed Heating BTU Output at 47 Degrees F: Enter the exact Heating BTU Output at 47 Degrees F value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Required Heating BTU Output at 17 Degrees F: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. Installed Heating BTU Output at 17 Degrees F: Enter the exact Heating BTU Output at 17 Degrees F value shown on in the Directory used to certify the equipment shown in Section A, above. N/A entry is allowed if heat pump system output is not rated at 17 degrees F in any directory
5. Compliance Statement: This field is filled out automatically. If both rating points are available compliance requires that the installed Heating BTU Output at 47 Degrees and Heating BTU Output at 17 Degrees meet the required minimum from CF2R-MCH-01 or if the high temperature is available compliance requires that the installed Heating BTU Output at 47 Degrees meet the required minimum from CF2R-MCH-01.

#### Section G. Verified Heat Pump System HSPF/HSPF2

1. Required Minimum HSPF2: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. Installed HSPF2: Enter the exact HSPF2 value shown on in the Directory used to certify the equipment shown in Section A, above.
3. Compliance Statement: This field is filled out automatically. Compliance requires that the installed HSPF2 meet the required minimum EER2.

**Section H. Verified Space Conditioning System Air Handler/Furnace**

1. This statement must be true for the system to comply.

**Section I. Verified Space Conditioning System Time Delay Relay**

1. This statement must be true for the system to comply.

**Section J. Verified Space Conditioning System TXV**

1. This statement must be true for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

Title 24, Part 6, Section 150.0(o) **Ventilation for Indoor Air Quality.** All dwelling units shall meet the requirements of ANSI/ASHRAE Standard 62.2-2022 Ventilation and Acceptable Indoor Air Quality in Single-Family Buildings subject to the amendments specified by Title 24, Part 6, Section 150.0(o)1

**A. Whole-Dwelling Mechanical Ventilation - General Information****Note:**

Non-dwelling units do not meet the definition for a dwelling unit as defined in Section 100.1(b). Non-dwelling units are not designed to provide independent living facilities and do not provide permanent provisions for living, sleeping, eating, cooking and sanitation.

01	Dwelling Unit Name	
02	Building Type	
03	Project Scope	
04	Total Conditioned Floor Area of Dwelling Unit (For addition projects the conditioned floor area equals existing area plus addition area)	
05	Number of Bedrooms in Dwelling Unit (For addition projects the number of bedrooms equals the existing bedrooms plus addition bedrooms)	
06	Ventilation System Type	
07	Ventilation Operation Schedule	
08	Fault Indicator Display (FID) Status	

**B1. Non-Dwelling Unit Compliance Statement**

01	
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(Or Sections B through K for dwelling unit projects)

**B. Single Family Attached/Detached General Information**

01	Average Ceiling Height	
02	Total Conditioned Volume	
03	Vertical distance between the lowest and highest above-grade points within the pressure boundary in feet	
04	Air Changes Per Hour at 50 Pa	
05	Name of ANSI/ASHRAE Standard 62.2-2022 weather station for climate zone	
06	Weather and shielding factor (wsf) (Based on the city identified above)	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Ventilation - Total Ventilation Rate**

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

01	Total Required Ventilation rate, ( $Q_{tot}$ )	
02	Enclosure Leakage Rate ( $Q_{50}$ )	
03	Effective Annual Average Infiltration Rate ( $Q_{inf}$ )	
04	Total Exterior Envelope Surface Area	
05	Unshared Exterior Envelope Surface Area (exclude surface areas attached to garages or other dwelling units)	
06	Required Mechanical Ventilation Rate ( $Q_{fan}$ )	

**D. Installed Ventilation - Total Ventilation Rate**

A mechanical supply system, exhaust system, or combination thereof shall provide whole-dwelling ventilation with outdoor air each hour at no less than the rate in 150.0(o)1Ci

01	02	03	04	05
Fan Name	Fan Location	Runtime (Min/Hr)	Installed Mechanical Ventilation Rate (CFM)	Equivalent Continuous Ventilation (CFM)
06	Total Installed Equivalent Continuous Ventilation (CFM)			

**E. HRV or ERV Serving Individual Dwelling Unit Information**

Balanced ventilation systems shall comply with appropriate requirements in 150.0(o)2C.

01	02	03
Manufacturer Make	Manufacturer Model Number	Fan Efficacy Performance Rating (W/CFM)

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Requirements for balanced and supply only ventilation systems (150.0(o)Civa1)**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

Balanced and supply ventilation component accessibility. Balanced and supply ventilation systems shall meet the following requirements for accessibility:

01	IAQ filter and HRV/ERV accessibility. System air filters and HRV/ERV heat/energy recovery cores shall be located such that they are accessible for service from within occupiable spaces, basements, garages, balconies, and mechanical closets. Filters and heat/energy cores behind access panels, access doors, or grilles located no more than 10 feet above a walking surface inside a space specified above comply with this requirement. <b>Exception to Section 150.0(o)1Civa:</b> Systems that require servicing from inside the attic shall have the following: <ol style="list-style-type: none"><li>1. A Fault Indicator Display (FID) meeting the requirements of Reference Appendix JA17; and</li><li>2. An attic access door located in a wall or, where attic access is provided through a ceiling, an attic access hatch that includes an integrated ladder; and</li><li>3. A walkway from the attic access door to the HRV/ERV.</li></ol>
02	IAQ System component accessibility: Fans, motors, heat exchangers, filters and recovery cores shall meet all applicable requirements of California Mechanical Code Section 304.0 accessibility for service.
03	Outdoor air intake design: Outdoor air intakes shall comply with California Mechanical Code Section 402.4.1.
04	Outdoor air intake location and accessibility: To provide access for cleaning, outdoor air intakes shall be accessible. Air intakes located not more than 10 feet above a walking surface comply with this requirement. If located on roofs, they shall meet the requirements of California Mechanical Code Section 304.3.1. <b>Exception to Section 150.0(o)1Civd:</b> Outdoor air intake serving equipment with an FID meeting requirement of Reference Appendix JA 17.

**G. Fault Indicator Display**

Qualification Requirements for Ventilation System Fault Indicator Displays are detailed in in Appendix JA17.

01	FID Manufacturer Name/Make	
02	FID Model Number	
03	The display module is mounted adjacent to the system thermostat.	
04	The manufacturer has certified to the Energy Commission that the FID model meets the requirements of Reference Joint Appendix JA17 (make and model found on CEC list of approved FID devices).	
05	The system has operated for at least 15 minutes and the FID reports that the system is operating within acceptable parameters.	

**H. Fault Indicator Display – Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

The responsible persons signature on this document indicates the installation complies with the following requirements:

01	Fault Indicator Display devices shall either be factory installed by the space-conditioning system manufacturer, or field installed according to the space-conditioning system manufacturer's requirements and the FID manufacturer's specifications.
02	The installer shall ensure that a copy of the FID manufacturer's user instructions documentation has been made available to the building owner.

**I. Dwelling Unit Compliance Statement**

01	
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****J. Other Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

The items listed below (6.1 through 6.6 and 6.8) correspond to the information given in ASHRAE 62.2 Section 6 "Other Requirements". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.8) for information describing these "Other Requirements". The signature of the Responsible Person in the declaration statement below certifies that the dwelling complies with these requirements specified in ASHRAE 62.2 Section 6.1 through 6.6 and 6.8 if applicable.

01	<p><b>6.1 Adjacent Spaces and Transfer Air.</b> Measures shall be taken to minimize air movement across envelope components to dwelling units from adjacent spaces such as garages, unconditioned crawlspaces, unconditioned attics, and other dwelling. Supply and balanced mechanical ventilation systems shall be designed and constructed to provide ventilation air directly from the outdoors.</p> <p><b>6.1.1 Attached Dwelling Units.</b> Attached dwelling units, except existing units as described in Normative Appendix A, Section A5, shall demonstrate compliance with Section 6.1 by verifying a leakage rate less than or equal to 0.2 cfm per ft<sup>2</sup> (100 L/s per 100 m<sup>2</sup>) of the dwelling-unit boundary area by means of a blower door test at a test pressure of 50 Pa. Testing shall be conducted in accordance with ANSI/RESNET/ICC Standard 380. For horizontally attached dwelling units that are being evaluated for the infiltration credit in Section 4.1.2, the procedure specified in Section 4.1.2 shall be an alternative to the procedure of this section.</p> <p><b>6.1.2 Garages.</b> When an occupiable space adjoins a garage, the design must prevent migration of contaminants to the adjoining occupiable space. Air seal the walls, ceilings, and floors that separate garages from occupiable space. To be considered air-sealed, all joints, seams, penetrations, openings between door assemblies and their respective jambs and framing, and other sources of air leakage through wall and ceiling assemblies separating the garage from the residence and its attic area shall be caulked, gasketed, weather stripped, wrapped, or otherwise sealed to limit air movement. Doors between garages and occupiable spaces shall be gasketed or made substantially airtight with weather stripping.</p> <p><b>6.1.3 Space-Conditioning System Ducts.</b> All air distribution joints located outside the dwelling-unit boundary shall be sealed. HVAC systems that serve spaces within the dwelling-unit boundary shall not be designed to supply air to or return air from the garage. HVAC systems that include air handlers or ducts located outside the dwelling-unit boundary shall have total air leakage of no more than 6% of total fan airflow when measured at 0.1 in. of water (25 Pa) using California Building Energy Efficiency Standards, Residential Appendix RA3.1 or equivalent. Method D of ASTM E1554 may be used to meet this requirement. If the air handler, ducts, or both are located in the garage, the garage door shall be open to the outside when the duct leakage is tested.</p>
02	<p><b>6.2 Labeling</b> Controls shall be labeled as to their function (unless that function is obvious, such as toilet exhaust fan switches).</p>
03	<p><b>6.3 Clothes Dryers.</b> Clothes dryers shall be exhausted directly to the outdoors.</p> <p><b>Exception to 6.3:</b> Condensing dryers plumbed to a drain.</p>
04	<p><b>6.4 Combustion and Solid-Fuel Burning Appliances.</b></p> <p><b>6.4.1</b> Combustion and solid-fuel-burning appliances must be provided with adequate combustion and ventilation air and installed in accordance with manufacturers' installation instructions, NFPA 31, NFPA 54/ANSI Z223.1, NFPA 211, or other equivalent code acceptable to the building official.</p> <p><b>6.4.2</b> Where atmospherically vented combustion appliances or solid-fuel burning appliances are located inside the dwelling unit boundary, the total net exhaust flow of the two largest exhaust fans (not including a summer cooling fan intended to be operated in conjunction with windows or other openings) shall not exceed 15 cfm per 100 ft<sup>2</sup> (75 L/s per 100 m<sup>2</sup>) of floor area when in operation at full capacity. If the designed total net airflow exceeds this limit, the net exhaust air flow must be reduced by reducing the exhaust air flow or providing compensating outdoor air. Gravity or barometric dampers in nonpowered exhaust makeup air systems shall not be used to provide compensating outdoor air. Atmospherically vented combustion appliances do not include direct-vent appliances. Combustion appliances that pass safety testing performed according to ANSI/BPI-1200 shall be deemed as complying with Section 6.4.2.</p>
05	<p><b>6.5 Ventilation Opening Area.</b> Spaces shall have ventilation openings as listed in the following subsections. Such openings shall meet the requirements of Section 6.6.</p> <p><b>Exception to 6.5:</b> Attached dwelling units and spaces that meet the local ventilation requirements set for bathrooms in Section 5 [of ASHRAE 62.2].</p> <p><b>6.5.1 Habitable Spaces.</b> Each habitable space shall be provided with ventilation openings with an openable area not less than 4% of the floor area or less than 5 ft<sup>2</sup> (0.5 m<sup>2</sup>).</p> <p><b>6.5.2 Toilets and Utility Rooms.</b> Toilets and utility rooms shall be provided with natural ventilation openings with an openable area not less than 4% of the room floor area or less than 1.5 ft<sup>2</sup> (0.15 m<sup>2</sup>).</p> <p><b>Exceptions to 6.5.2:</b></p> <ol style="list-style-type: none"> <li>1. Utility rooms with a dryer exhaust duct.</li> <li>2. Toilet compartments in bathrooms.</li> </ol>

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

06	<p><b>6.6 Air Inlets.</b> Air inlets that are part of the ventilation design shall be located a minimum of 10 ft (3 m) from known sources of contamination such as a stack, vent, exhaust hood, or vehicle exhaust. The intake shall be placed so that entering air is not obstructed by snow, plantings, or other material. Forced air inlets shall be provided with rodent/insect screens (mesh not larger than 0.5 in. [13 mm]).</p> <p><b>Exceptions to 6.6:</b></p> <ol style="list-style-type: none"><li>1. Ventilation openings in the wall may be as close as a stretched-string distance of 3 ft (1 m) from sources of contamination exiting through the roof or dryer exhausts.</li><li>2. No minimum separation distance shall be required between windows and local exhaust outlets in kitchens and bathrooms.</li><li>3. Vent terminations covered by and meeting the requirements of the <i>National Fuel Gas Code</i> (NFPA 54/ANSI Z223.1) or equivalent.</li><li>4. Where a combined exhaust/intake termination is used to separate intake air from exhaust air originating in a living space other than kitchens, no minimum separation distance between these two openings is required. For these combined terminations, the exhaust air concentration within the intake airflow shall not exceed 10%, as established by the manufacturer.</li></ol>
07	<p><b>6.8 Carbon Monoxide Alarms.</b> A carbon monoxide alarm shall be installed in each dwelling unit in accordance with NFPA 72, <i>National Fire Alarm and Signaling Code</i>, and shall be consistent with requirements of applicable laws, codes, and standards.</p>
08	<p><b>Air Filter Efficiency.</b> Supply only ventilation systems, makeup air-systems, and supply side balanced systems including HRV/ERV shall be provided with air filters having a designated efficiency equal to or greater than MERV 13 when tested in accordance with ASHRAE Standard 52.2, or a particle size efficiency rating equal to or greater than 50% in the 0.30-1.0 <math>\mu</math>m range and equal to or greater than 85% in the 1.0-3.0 <math>\mu</math>m range when tested in accordance with AHRI Standard 680.</p>



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****K. Air Moving Equipment**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

The items listed below (7.1 through 7.5) correspond to the information given in ASHRAE 62.2 Section 7 "Air-Moving Equipment". Refer also to Chapter 4.6 of the Residential Compliance Manual (Section 4.6.9) for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the dwelling complies with these requirements specified in ASHRAE 62.2 Section 7.1 through 7.5 if applicable.

01	<b>7.1 Ratings.</b> Airflow and sound ratings shall be provided for ventilation devices and equipment serving individual dwelling units. Airflow and sound ratings shall be provided in accordance with HVI 920, or equivalent, by an administration and certification body that is accredited in accordance with ISO/IEC 17065 with respect to application of the standards and test procedures referenced in Section 7.1 and accredited by an accreditation body operating in accordance with ISO/IEC 17011. Laboratory tests of representative units shall be conducted for airflow in accordance with ANSI/ASHRAE Standard 51/AMCA 210, as prescribed by HVI 916, or equivalent, and conducted for sound in accordance with ANSI/AMCA Standard 300, as prescribed by HVI 915, or equivalent. This section does not require certification to HVI 917
02	<b>7.2 Installation.</b> Installations of systems or equipment shall be carried out in accordance with manufacturer's design requirements and installation instructions.
03	<b>7.3 Sound Ratings for Fans.</b> Ventilation fans shall be rated for sound at no less than the minimum airflow rate required by this standard as noted below. These sound ratings shall be at a minimum of 0.1 in. of water (25 Pa) static pressure in accordance with the HVI procedures referenced in Section 7.1. <b>Exception to 7.3:</b> HVAC air handlers and remote mounted fans need not meet sound requirements. To be considered for this exception, a remote mounted fan must be mounted outside the habitable spaces, bathrooms, toilets, and hallways, and there must be at least 4 ft (1 m) of ductwork between the fan and the intake grille. <b>7.3.1 Dwelling-Unit Ventilation or Continuous Local Exhaust Fans.</b> These fans shall be rated for sound at a maximum of 1.0 sone. <b>7.3.2 Demand-Controlled Local Exhaust Fans.</b> Bathroom exhaust fans used to comply with Section 5.2 shall be rated for sound at a maximum of 3 sones at one or more airflow settings greater than or equal to 100 cfm (47 L/s). <b>Exception to 7.3.2:</b> Fans with a minimum airflow setting exceeding 400 cfm (189 L/s) need not comply.
04	<b>7.4 Exhaust Ducts.</b> <b>7.4.1 Multiple Exhaust Fans Using One Duct.</b> Exhaust fans in separate dwelling units shall not share a common exhaust duct. If more than one of the exhaust fans in a single dwelling unit shares a common exhaust duct, each fan shall be equipped with a backdraft damper to prevent the recirculation of exhaust air from one room to another through the exhaust ducting system. <b>7.4.2 Single Exhaust Fan Ducted to Multiple Exhaust Inlets.</b> Where exhaust inlets are commonly ducted across multiple dwelling units, one or more exhaust fans located downstream of the exhaust inlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.
05	<b>7.5 Supply Ducts.</b> Where supply outlets are commonly ducted across multiple dwelling units, one or more supply fans located upstream of all the supply outlets shall be designed and intended to run continuously, or a system of one or more backdraft dampers shall be installed to isolate each dwelling unit from the common duct when the fan is not running.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-27-H User Instructions

### Section A. General Information

1. Building Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document. This is the unique identifier for this dwelling unit. Ventilation is calculated and provided for each dwelling unit individually.
2. Building Type: This field is filled out automatically. It is referenced from the CF1R. Values are “Single Family Attached” and “Single Family Detached”. User is allowed to overwrite imported value with “Non-dwelling unit” selection.
3. Project Scope: This field is filled out automatically. It is referenced from the CF1R.
  - If parent document is the CF1R-PRF-01, values are “Newly Constructed”, “Newly Constructed (Addition Alone)” and “Addition and /or Alteration”
  - If parent document is CF1R-NCB-01, values are “Newly Constructed” and “Newly Constructed (Addition Alone)”
  - If parent document is CF1R-ADD-01, values are “ADU Addition < 300 ft<sup>2</sup>”, “ADU Addition > 300 to < 400 ft<sup>2</sup>”, “ADU Addition > 400 to < 700 ft<sup>2</sup>” and “ADU Addition > 700 to < 1000 ft<sup>2</sup>”.
4. Total Conditioned Floor Area of Dwelling Unit: This field is filled out automatically. It is referenced from the CF2R-MCH-01.
5. Number of Bedrooms in Dwelling Unit: This field is filled out automatically. It is referenced from the CF2R-MCH-01.
6. Ventilation system Type: This may be filled out automatically or be user input.
  - If parent document is the CF1R-PRF-01, the value will be filled out automatically.
  - If building type is equal to Non-dwelling unit, an N/A value will be filled out automatically.
  - If parent document is the CF1R-NCB or CF1R-ADD, user selects from list of Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV, Central Fan Integrated (CFI), Central Ventilation System – Supply and Central Ventilation System – Exhaust and Central Ventilation System Balanced.
7. Ventilation operation schedule: This may be filled out automatically or be user input.
  - Building type is equal to Non-dwelling unit; an N/A value will be filled out automatically.
  - User selects from list of Continuous, Short-Term Average, Scheduled and Real-time Control.
  - Note if “Ventilation System Type” (A06) = Central Fan Integrated & “Ventilation Operation Schedule” (A07) = Continuous; then user will not be allowed to proceed.

### Section B1. Non-Dwelling Unit Compliance Statement

If this is a non-dwelling unit Section B1 is the only section besides Section A in the report.

1. This is automatically completed.

If this is a single family detached or single family attached , the following Sections B through K are required

### Section B. Single Family Attached/Detached General Information

1. Average Ceiling Height: This may be filled out automatically or be user input.
  - If parent document is the CF1R-PRF-01, the value will be filled out automatically.
  - If parent document is the CF1R-NCB or CF1R-ADD, user enter value in feet.
2. Total Conditioned Volume: This field is calculated and filled out automatically.
3. Vertical distance between the lowest and highest above-grade points within the pressure boundary in feet: This may be filled out automatically or be user input.
  - If parent document is the CF1R-PRF-01, the value will be filled out automatically.
  - If parent document is the CF1R-NCB or CF1R-ADD, user enters value in feet.

4. Air Changes Per Hour at 50 Pa: This may be filled out automatically or be user selected
  - If Building type is equal to Non-dwelling unit, an N/A value will be filled out automatically.
  - If Building type does not equal Non-dwelling unit, then user may select from Default (ACH50=2.0) or Measured (ACH50<2.0)
5. Name of ANSI/ASHRAE Standard 62.2-2016 weather station for climate zone: This may be filled out automatically or be user input.
  - If parent document is the CF1R-PRF-01, the value will be filled out automatically.
  - If Building type is equal to Non-dwelling unit, an N/A value will be filled out automatically.
  - If parent document is the CF1R-NCB or CF1R-ADD, user select value from Weather Stations from the Table X1 US Climates, Normative Appendix X.
6. Weather and shielding factor (wsf): This value is automatically entered based on the selection in #6.

### Section C. Whole-Dwelling Continuous Ventilation – Total Ventilation Rate Method

1. This value is automatically calculated using equation 150.0-B from the Energy Standards.
2. This value automatically calculates using either equation 150.0-C or 150.0-D from the Energy Standards.
  - If air changes per hour from section B is equal to “Default” then equation, 150.0-C will be used.
  - If air changes per hour from section B is equal to “Measured” and the leakage value from the CF2R-MCH-24 is < 2.0 then equation 150.0-D will be used.
  - If air changes per hour from section B is equal to “Measured” and the leakage value from the CF2R-MCH-24 is ≥ 2.0 then equation 150.0-C will be used.
3. This value is automatically calculated using equation 150.0-E from the Energy Standards.
4. Total Exterior Envelope Surface Area: This value may be filled out automatically or be user input.
  - If dwelling type from section A equals “Single Family Detached”, an N/A value will be filled out automatically.
  - If dwelling type from section A equals “Single Family Attached” and the parent document is the CF1R-PRF-01 then value will be automatically entered.
  - If dwelling type from section A equals “Single Family Attached” and the parent document is the CF1R-NCB-01 or CF1R-ADD-01 then user enter value (ft<sup>2</sup>).
5. Unshared Exterior Surface Area: This value may be filled out automatically or be user input.
  - If dwelling type from section A equals “single family detached”, an N/A value will be filled out automatically.
  - If dwelling type from section A equals “single family attached” and the parent document is the CF1R-PRF-01 then value will be automatically entered.
  - If dwelling type from section A equals “single family attached” and the parent document is the CF1R-NCB-01 or CF1R-ADD-01 then user enter value (ft<sup>2</sup>).
6. This value is automatically calculated using equation 150.0-F from the Energy Standards.

### Section D. Installed Ventilation – Total Ventilation Rate Method

1. User input text identifying the fan name for each installed ventilation fan.
2. User input text identifying the fan location for each installed ventilation fan.
3. Runtime (Min/Hr): This value may be filled out automatically or be user input.
  - If ventilation operation schedule from section B = “continuous”, then value of 60 will be automatically entered.
  - If ventilation operation schedule from section B = “short term average”, then user enter value of less than or equal to 60 for each installed ventilation fan.
4. User to enter CFM value from test procedures described in RA3.7.4 for each installed ventilation fan.

5. Equivalent continuous ventilation CFM is automatically calculated for each ventilation fan.
6. Total installed equivalent continuous ventilation CFM is automatically calculated based on the installed ventilation fans.

NORMATIVE APPENDIX B:

INFILTRATION EFFECTIVENESS WEATHER AND SHIELDING FACTORS (WSF)

TABLE B1 U.S. Climates

TMY3	wsf	Weather Station	Latitude	Longitude	State
690150	0.50	Twentynine Palms	34.30	–116.17	California
722860	0.43	March AFB	33.90	–117.25	California
722868	0.45	Palm Springs Intl	33.83	–116.50	California
722869	0.42	Riverside Muni	33.95	–117.45	California
722880	0.39	Burbank–Glendale–Pasadena AP	34.20	–118.35	California
722885	0.39	Santa Monica Muni	34.02	–118.45	California
722886	0.39	Van Nuys Airport	34.22	–118.48	California
722895	0.55	Lompoc (AWOS)	34.67	–120.47	California
722897	0.51	San Luis Co Rgnl	35.23	–120.63	California
722899	0.45	Chino Airport	33.97	–117.63	California
722900	0.38	San Diego Lindbergh Field	32.73	–117.17	California
722903	0.39	San Diego/Montgomery	32.82	–117.13	California
722904	0.40	Chula Vista Brown Field NAAS	32.58	–116.98	California
722906	0.39	San Diego North Island NAS	32.70	–117.20	California
722926	0.40	Camp Pendleton MCAS	33.30	–117.35	California
722927	0.38	Carlsbad/Palomar	33.13	–117.28	California
722930	0.39	San Diego Miramar NAS	32.87	–117.13	California
722950	0.42	Los Angeles Intl Arpt	33.93	–118.40	California
722956	0.38	Jack Northrop Fld H	33.92	–118.33	California
722970	0.38	Long Beach Daugherty Fld	33.83	–118.17	California
722976	0.34	Fullerton Municipal	33.87	–117.98	California
722977	0.36	Santa Ana John Wayne AP	33.68	–117.87	California
723805	0.51	Needles Airport	34.77	–114.62	California
723810	0.59	Edwards AFB	34.90	–117.87	California
723815	0.58	Daggett Barstow–Daggett AP	34.85	–116.80	California
723816	0.62	Lancaster Gen Wm Fox Field	34.73	–118.22	California
723820	0.57	Palmdale Airport	34.63	–118.08	California
723830	0.68	Sandberg	34.75	–118.72	California
723840	0.43	Bakersfield Meadows Field	35.43	–119.05	California
723890	0.45	Fresno Yosemite Intl AP	36.78	–119.72	California
723895	0.42	Porterville (AWOS)	36.03	–119.07	California
723896	0.43	Visalia Muni (AWOS)	36.32	–119.40	California
723910	0.45	Point Mugu Nf	34.12	–119.12	California

NORMATIVE APPENDIX B:  
INFILTRATION EFFECTIVENESS WEATHER AND SHIELDING FACTORS (WSF)  
TABLE X1 U.S. Climates

TMY3	wsf	Weather Station	Latitude	Longitude	State
723925	0.44	Santa Barbara Municipal AP	34.43	-119.85	California
723926	0.43	Camarillo (AWOS)	34.22	-119.08	California
723927	0.45	Oxnard Airport	34.20	-119.20	California
723940	0.52	Santa Maria Public Arpt	34.92	-120.47	California
723965	0.53	Paso Robles Municipal Arpt	35.67	-120.63	California
724800	0.55	Bishop Airport	37.37	-118.35	California
724815	0.46	Merced/Macready Fld	37.28	-120.52	California
724830	0.51	Sacramento Executive Arpt	38.50	-121.50	California
724837	0.45	Beale AFB	39.13	-121.43	California
724838	0.50	Yuba Co	39.10	-121.57	California
724839	0.51	Sacramento Metropolitan AP	38.70	-121.58	California
724915	0.49	Monterey Naf	36.60	-121.87	California
724917	0.54	Salinas Municipal AP	36.67	-121.60	California
724920	0.50	Stockton Metropolitan Arpt	37.90	-112.23	California
724926	0.47	Modesto City – County AP	37.63	-120.95	California
724927	0.53	Livermore Municipal	37.70	-121.82	California
724930	0.54	Oakland Metropolitan Arpt	37.72	-122.22	California
724935	0.47	Hayward Air Term	37.67	-122.12	California
724936	0.53	Concord – Buchanan Field	38.00	-122.05	California
724940	0.60	San Francisco Intl AP	37.62	-122.40	California
724945	0.48	San Jose Intl AP	37.37	-121.93	California
724955	0.55	Napa Co. Airport	38.22	-122.28	California
724957	0.49	Santa Rosa (AWOS)	38.52	-122.82	California
725845	0.44	Blue Canyon AP	39.30	-120.72	California
725846	0.66	Truckee–Tahoe	39.32	-120.13	California
725847	0.64	South Lake Tahoe	38.90	-120.00	California
725905	0.47	Ukiah Municipal AP	39.13	-123.20	California
725910	0.50	Red Bluff Municipal Arpt	40.15	-122.25	California
725920	0.47	Redding Municipal Arpt	40.52	-122.32	California
725945	0.56	Arcata Airport	40.98	-124.10	California
725946	0.60	Crescent City Faa Ai	41.78	-124.23	California
725955	0.55	Montague Siskiyou County AP	41.78	-122.47	California
725958	0.59	Alturas	41.50	-120.53	California
745090	0.45	Mountain View Moffett Fld NAS	37.40	-122.05	California
745160	0.67	Travis Field AFB	38.27	-121.93	California
746120	0.52	China Lake Naf	35.68	-117.68	California
747020	0.50	Lemoore Reeves NAS	36.33	-119.95	California
747185	0.46	Imperial	32.83	-115.58	California
747187	0.46	Palm Springs Thermal AP	33.63	-116.17	California
747188	0.48	Blythe Riverside Co Arpt	33.62	-114.72	California

**Section E. HRV or ERV Information**

1. Manufacturer Make – User input text
2. Manufacturer Model Number – User input text
3. Fan Efficacy Performance Rating – Reference information from CF1R or be user input

## **Section F. Requirements for balanced and supply only ventilation systems**

### **Section G. Fault Indicator Display**

1. Enter the manufacturer name or make of the approved Fault Indicator Display. Must match name shown on the list of approved devices kept by the Commission.
2. Enter the manufacturer model number of the approved Fault Indicator Display. Must match name shown on the list of approved devices kept by the Commission.
3. The installer must confirm that the FID display module is mounted adjacent to thermostat that controls the system being verified. This requirement is detailed in Residential Appendix JA17.
4. The installer must confirm that the installed FID is approved and appears the list of approved devices kept by the Commission. This requirement is detailed in Residential Appendix JA17.
5. The installer must confirm that the system has operated for at least 15 minutes and that they system is operating within acceptable parameters as specified by the FID and equipment manufacturers. This requirement is detailed in Residential Appendix JA17.

### **Section H. Fault Indicator Display – Additional Requirements**

### **Section I. Compliance Statement**

1. Compliance Statement: This field is filled out automatically

### **Section J - Other Requirements**

### **Section K - Air Moving Equipment**

### **Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

**RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 150.0-B OR C**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. System Information**

01	System Identification or Name	
02	System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Nominal Cooling Capacity (tons) of Condenser	
05	Number of Return Ducts Used for Compliance	
06	Number of Additional Return Ducts (Not Used for Compliance)	

**B. One Return Duct**

01	Return Duct Minimum Nominal Diameter (inches)	
02	Installed Return Duct Nominal Diameter (inches)	
03	Minimum Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
04	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
05	Compliance Statement:	

**C. Two Return Ducts**

01	Minimum Return Duct1 Nominal Diameter (inches)	
02	Installed Return Duct1 Nominal Diameter (inches)	
03	Minimum Return Duct2 Nominal Diameter (inches)	
04	Installed Return Duct2 Nominal Diameter (inches)	
05	Minimum Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
06	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )	
07	Compliance Statement:	

**D. Additional Requirements for Compliance**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Qualification for the Alternative to Section 150.0(m)13B and D requires that the ducted space conditioning system shall not use zoning dampers. Systems that use zoning dampers shall comply with the requirements of Section 150.0(m)13.
02	The return duct length for each return air filter grille shall not exceed 30 linear feet.
03	The return duct(s) shall not contain more than a total of 180° of bend.
04	If the return duct contains more than 90° of bend, one of the bends shall be a metal elbow.
05	Return grille devices shall be labeled in accordance with the requirements in section 150.0(m)12Biv to disclose the grille's design airflow rate and a maximum allowable clean-filter pressure drop of 25 Pa (0.1 inches water) for the air filter when tested using ASHRAE Standard 52.2, or as rated in accordance with AHRI Standard 680 for the design airflow rate for the return grille.

**E. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

Procedures for installing HSPP or PSPP are specified in RA3.3.1.1.

01	Method Used to Demonstrate Compliance with the HSPP/PSPP Requirement	
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RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 150.0-B OR C



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**F. Additional Return Ducts (Not Used for Compliance)**

01	02
Installed Return Duct Nominal Diameter (inches)	Installed Total Return Filter Grille Nominal Area (inch <sup>2</sup> )

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.



**RETURN DUCT DESIGN AND AIR FILTER DEVICE SIZING  
ACCORDING TO TABLES 150.0-B OR C**



CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-28-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-28-H User Instructions

### Section A. System Information

1. System Identification or Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. System Location or Area Served: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. Nominal Cooling Capacity (tons) of Condenser: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
5. Number of Return Ducts: Select the number of return ducts from the options given in the pull down list, either one or two return ducts. Those are the only options for this compliance approach. Other configurations will require that airflow and fan watt draw be verified by diagnostic testing.

### Section B. One Return Duct

1. Minimum Return Duct Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 150.0-B.
2. Installed Return Duct Nominal Diameter: Enter the installed return duct nominal diameter (inches).
3. Minimum Total Return Filter Grille Nominal Area: This field is automatically calculated based on A03. Refer to Table 150.0-B.
4. Installed Total Return Filter Grille Nominal Area: Enter the installed return filter grille nominal area (inch<sup>2</sup>). The nominal grille area is equal to the length (inches) multiplied by the width (inches) of the return grille.
5. Compliance Statement: This field is automatically populated based on the inputs to rows B02 and B04. Compliance requires that the installed duct nominal diameter meet or exceed the required duct nominal diameter AND the installed filter grille nominal area meet or exceed the required filter grille nominal area.

### Section C. Two Return Ducts

1. Minimum Return Duct1 Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 150.0-C.
2. Installed Return Duct1 Nominal Diameter: Enter the nominal diameter (inches) for the first return duct run.
3. Minimum Return Duct2 Nominal Diameter: This field is automatically calculated based on A03. Refer to Table 150.0-C.
4. Installed Return Duct2 Nominal Diameter: Enter the nominal diameter (inches) for the second return duct run.
5. Minimum Total Return Filter Grille Nominal Area: This field is automatically calculated based on A03. Refer to Table 150.0-C.
6. Installed Total Return Filter Grille Nominal Area: Enter the total return filter grille nominal area by summing up the two grille areas. The nominal area of each grille is equal to the length (inches) multiplied by the width (inches) of the return grille.
7. Compliance Statement: This field is automatically populated based on the inputs to C02, C04 and C06. Compliance requires that the installed duct nominal diameters meet or exceed the required duct nominal diameters AND the total installed filter grille nominal area meet or exceed the total required filter grille nominal area.

**Section D Additional Requirements for Compliance**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

**Section E. Hole for the Placement of a Static Pressure Probe (HSPP), and Permanently Installed Static Pressure Probe (PSPP) in the Supply Plenum**

1. A hole for a static pressure probe (HSPP) or a permanent static pressure probe (PSPP) is required when system airflow verification is required, whether the airflow test method used requires one or not. Select the appropriate choice from the following options using a dropdown box, the Static Pressure Measurement Method:
  - A. If an Hole Static Pressure Probe is installed then select “HSPP Installed”
  - B. If a Permanent Static Pressure Probe is installed then select “PSPP Installed”
  - C. If the system is configured such that an HSPP nor PSPP can be installed, an alternate location that provides access for making supply plenum pressure measurement may be used. Select “An alternative location has been provided and clearly labeled.”
  - D. If the system is such that an HSPP or PSPP is not applicable, select “HSPP/PSPP are not applicable to this system”.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.



# DUCT SURFACE AREA REDUCTION; R-VALUE; BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

*Note: Submit one Certificate of installation for each duct system that must demonstrate compliance in the dwelling.*

### A. Duct System Information

01	Space Conditioning System Name or Identification/Tag	
02	Space Conditioning System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Status - Duct Surface Area Reduction And R-Value Compliance Credit	
05	Status - Buried Ducts Compliance Credit	
06	Status - Deeply Buried Ducts Compliance Credit	

### B. Duct Surface Area Reduction and R-value Compliance Credit

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Credit is available for supply duct systems with reduced surface area in unconditioned space with varying combinations of higher performance insulation if the system complies with the following requirements.

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The duct system installation, including duct sizes, R-values, and lengths, and locations of supply & return registers shall conform to the duct system design layout approved by the enforcement agency.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.4.
05	The duct system installation shall not have severely twisted or compressed sections that would restrict required operating airflow.



# DUCT SURFACE AREA REDUCTION; R-VALUE; BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### C. Buried Ducts Compliance Credit

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Ducts partly or completely buried in blown attic insulation in dwelling units meeting the requirements for verified quality insulation installation may take credit for increased effective duct insulation if the system complies with the following requirements.

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The installed duct system and attic insulation shall conform to the design details in the enforcement agency approved LMCC-PRF-01-E. These installation details include, duct nominal diameter, R-value, and length of each segment, ceiling insulation depth, type (i.e. fiberglass or cellulose), and R-value, and supply and return register locations.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.5. Verification of duct system installation shall be completed prior to burial of ducts. Verification of insulation installation shall be completed by a second ECC inspection after ducts are buried.
05	Ducts shall not have severely twisted or compressed sections that would restrict required operating airflow.
06	Ducts shall be buried by a uniform level of insulation (i.e. no mounding attic insulation to achieve burial level), lay directly or within 3.5 inches of ceiling gypsum board, and have at least 6 inches of space between the duct outer jacket and the roof sheathing.
07	The dwelling shall comply with all Quality Insulation Installation requirements as documented on the applicable CF2R and LMCV.

### D. Deeply Buried Ducts Compliance Credit

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

Duct segments meeting the requirements for buried ducts and covered by at least 3.5 inches of insulation can take credit for effective duct insulation levels greater than buried ducts. Deeply buried ducts have the option of using lowered portions of the ceiling or durable containment systems to achieve burial depth greater than the overall attic insulation level. Deeply buried duct systems must comply with the following requirements.

01	The duct system design shall be detailed in the special features section of the LMCC-PRF-01-E approved by the enforcement agency.
02	A duct design layout that conforms to the duct system design details in the special features section of the LMCC-PRF-01-E shall be documented on the building design plans approved by the enforcement agency.
03	The installed duct system and attic insulation shall conform to the design details in the enforcement agency approved LMCC-PRF-01-E. These installation details include, duct nominal diameter, R-value, and length of each segment, ceiling insulation depth, type (i.e. fiberglass or cellulose), and R-value, lowered chase or containment system locations, and supply and return register locations.
04	The duct system installation shall be verified by an ECC rater according to the requirements in RA3.1.4.1.6. Verification of duct system installation shall be completed prior to burial of ducts. Verification of insulation installation shall be completed by a second ECC inspection after ducts are buried.
05	Ducts shall not have severely twisted or compressed sections that would restrict required operating airflow.
06	Ducts shall be buried by a uniform level of insulation (i.e. no mounding attic insulation to achieve burial level), lay directly or within 3.5 inches of ceiling gypsum board, and have at least 6 inches of space between the duct outer jacket and the roof sheathing.
07	The dwelling shall comply with all Quality Insulation Installation requirements as documented on the applicable LMCI and LMCV.
08	Containment systems shall have walls at least 7 inches wider than the duct outer diameter, extend at least 3.5 inches above the duct jacket, be filled completely with blown insulation, and have the duct centered between the containment walls.



# DUCT SURFACE AREA REDUCTION; R-VALUE; BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-29-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

## E. Duct System Design Details

01	02	03	04	05	06	07	08	09
Duct Segment Identification	Nominal Diam. (in)	Duct R-value	Length (ft)	Attic Insulation R-value	Attic Insulation Depth (in)	Attic Insulation Type	Containment System or Lowered Chase	Duct Burial Level

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



# DUCT SURFACE AREA REDUCTION; R-VALUE; BURIED DUCTS COMPLIANCE CREDIT

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-29-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### DOCUMENTATION AUTHOR'S DECLARATION STATEMENT

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-MCH-29-H
Supply Duct Compliance Credits - Location; Surface Area; R-value	(Page 1 of 2)

## CF2R-MCH-29-H User Instructions

### Section A. Duct Information

1. *System Identification or Name*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
2. *System Location or Area Served*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
3. *Indoor Unit Name*: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. *Status – Duct Surface Area Reduction and R-Value Compliance Credit*: This field is auto-filled from the CF1R-PRF-01-E indicating if the credit is being used. If not, then N/A will be displayed.
5. *Status – Buried Ducts Compliance Credit*: This field is auto-filled from the CF1R-PRF-01-E indicating if the credit is being used. If not, then “N/A” will be displayed.
6. *Status – Deeply Buried Ducts Compliance Credit*: This field is auto-filled from the CF1R-PRF-01-E indicating if the credit is being used. If not, then “N/A” will be displayed.

### Section B. Supply Duct Surface Area Reduction and R-value Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

### Section C. Buried Ducts Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.

### Section D. Deeply Buried Ducts Compliance Credit

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement (or not applicable) for the system to comply.
7. This field must be a true statement (or not applicable) for the system to comply.
8. This field must be a true statement (or not applicable) for the system to comply.

### Section E. Duct System Design Details

This table is a calculated field: table copied from CF1R-PRF-01

1. Reference information from CF1R-PRF-01, which must be completed prior to this document.
2. Reference information from CF1R-PRF-01, which must be completed prior to this document.
3. Reference information from CF1R-PRF-01, which must be completed prior to this document.
4. Reference information from CF1R-PRF-01, which must be completed prior to this document.



CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-MCH-29-H
Supply Duct Compliance Credits - Location; Surface Area; R-value	(Page 2 of 2)

5. Reference information from CF1R-PRF-01, which must be completed prior to this document.
6. Reference information from CF1R-PRF-01, which must be completed prior to this document.
7. Reference information from CF1R-PRF-01, which must be completed prior to this document.
8. Reference information from CF1R-PRF-01, which must be completed prior to this document.
9. Reference information from CF1R-PRF-01, which must be completed prior to this document.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

*NOTE: When the Certificate of Compliance indicates a Central Fan Ventilation Cooling system (CFVCS) is installed, the following items must be verified.*

**A. Central Fan Ventilation Cooling System (VCS) Equipment Information**

01	Space Conditioning System Identification or Name	
02	Space Conditioning System Location or Area Served	
03	Indoor Unit Name or Description of Area Served	
04	Central FanVCS Equipment - Manufacturer Name	
05	Central Fan VCS Equipment - Manufacturer Model #	
06	Central FanVCS Equipment - Fan Type Required	
07	Central FanVCS Equipment - Fan Type Installed	
08	Central FanVCS Equipment - Manufacturer Documentation Status	
09	Duct Leakage Verification Status	
10	Airflow Rate Verification Status	
11	Fan Efficacy Verification Status	
12	Compliance Statement:	

**B. Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	When the Central Fan Ventilation Cooling system directs its relief airflow into the dwelling's attic, the attic vent free area shall be equal to or greater than 1 ft <sup>2</sup> per 750 CFM of the system's rated Ventilation Cooling airflow.
02	Variable speed motor systems shall be capable of varying system airflow rate in a continuous range between full airflow rate (100%) and a minimum airflow rate of no more than 25% of the full airflow rate.
03	Central fan ventilation cooling system controls shall include proper installation of an indoor thermostat.
04	Central fan ventilation cooling system controls shall include installation of an outdoor temperature sensor to initiate or terminate ventilation cooling operation automatically in response to user preference or availability of ventilation cooling capacity of outside air.
05	Central fan ventilation cooling system controls shall include proper installation of an air handler temperature sensor, or damper end switches, or other control device(s) that ensure correct outdoor air damper position.
06	The central fan ventilation cooling system manufacturer shall provide detailed system operation documentation to the building owner that describes how to configure the system controls and operate the system to obtain the maximum energy savings benefit. The manufacturer's system operation documentation shall also describe how the system's control strategy is implemented; how the fan speed is controlled during ventilation cooling mode; and how ventilation cooling rates are determined. System target ventilation cooling rate calculations (if applicable) shall occur at time intervals of 24 hours or less to ensure the system responds correctly to changes in weather patterns.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-30-E User Instructions

### Section A. Central Fan Ventilation Cooling System (VCS) Equipment Information

1. Enter the Central Fan Ventilation Cooling System (CFVCS) Name or identification tag to help identify this system from other systems in the house. This field is automatically filled in as referenced from the MCH-01 description for this system.
2. Enter the Location or Area Served by the Central FanVCS. This is a tag to distinguish this system from other systems in the house. This field is automatically filled in as referenced from the MCH-01 description for this system.
3. Indoor Unit Name: This field is filled out automatically. It is referenced from the CF2R-MCH-01, which must be completed prior to this document.
4. Enter the Central FanVCS Manufacturer Name.
5. Enter the Central FanVCS Manufacturer Model Number.
6. The Central FanVCS Fan Type Required is specified by the performance approach software. This field is filled in automatically as referenced from the CF1R.
7. Enter the Central FanVCS Fan Type Installed. The choices are “Fixed Flow” or “Variable Flow”. Variable fans receive more compliance credit. The installed fan type should match the fan type specified on the CF1R.
8. Installer must verify/confirm that the Central FanVCS Equipment is included in the Energy Commission listing of approved CFVCS devices and that the fan type, “Fixed” or “Variable”, matches what is shown on the list.
9. Compliance Credit for Central Fan VCS also requires that the system conforms to the maximum Duct Leakage verification requirements. This row automatically queries the project data to confirm that a MCH-20 has been registered indicating that the system passed the duct leakage criterion.
10. Compliance Credit for Central FanVCS also requires that the system pass the Airflow Rate requirements. This row automatically queries the project data to confirm that the applicable MCH-23 Airflow Rate verification has been registered indicating that the system passed.
11. Compliance Credit for Central FanVCS also requires that the system pass the Fan Efficacy requirements. This row automatically queries the project data to confirm that a MCH-22 Fan Efficacy verification has been registered indicating that the system passed.
12. Compliance Statement. The system must comply with all verification requirements in Section A in order to pass.

### Section B. Additional Requirements

The System must comply with all of the additional requirements that are applicable in order to be in compliance with the Central Fan Ventilation Cooling System (CFVCS) compliance credit requirements.

1. This field must be a true statement for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.
6. This field must be a true statement for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Whole House Fan Measurement Procedures**

01	Whole House Fan Airflow/Watts Measurement Procedure:	
----	--	--

**B. Required Whole House Fan Specifications**

01	02	03
Fan Name	WHF Modeled Airflow (CFM)	WHF Modeled Fan Power (Watts)

**C1. Tested Whole House Fan Equipment Information – Airflow and watts measured per Whole House Fan**

Requirements for Whole House Fans are given in Sections 150.1(b)2.B.vi and 150.1(c)12

01	02	03	04	05	06
Fan Name	Fan Location	WHF Manufacturer Name	WHF Model Number	WHF Tested Airflow (CFM) Per RA3.9.4.1	WHF Tested Watts Per RA3.9.4.2

**C2. Tested Whole House Fan Equipment Information – Airflow measured per whole house fan and watts measured as a total value**

Requirements for Whole House Fans are given in Sections 150.1(b)2.B.vi and 150.1(c)12

01	02	03	04	05	06
Fan Name	Fan Location	WHF Manufacturer Name	WHF Model Number	WHF Tested Airflow (CFM) Per RA3.9.4.1	WHF Tested Watts Per RA3.9.4.2

**D. Whole House Fan Compliance Calculations**

01	Required CFM	
02	Installed CFM	
03	Required Fan Efficacy (Watts/CFM)	
04	Installed Fan Efficacy (Watts/CFM)	

**E. Compliance Statement**

--

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Additional Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The installed fan shall be listed in the Home Ventilating Institute Certified Products Directory
02	The homeowner shall be provided with user instructions documentation that describes the proper use of the whole house fan necessary to obtain the full energy savings benefit.

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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



**CF2R-MCH-31-H User Instructions****Section A. Whole House Fan Measurement Procedures**

1. Select the procedure used to measure whole house fan Airflow.
2. Select the procedure used to measure whole house fan Watts.

**Section B. Required Whole House Fan Specifications**

1. Fan name will be auto populated from CF1R.
2. Whole House Fan (WHF) airflow in CFM will be auto populated from CF1R.
3. Whole House Fan (WHF) power in Watts will be auto populated from CF1R.

**Section C1. Whole House Fan (WHF) Equipment Information** (This section is required if procedure in A01 uses a Portable Meter)

1. Fan name will be auto populated from CF1R.
2. Enter the location where each whole house fan is installed in the house.
3. Enter the name of the manufacturer for each whole house fan installed in the house.
4. Enter the model number for each whole house fan installed in the house.
5. Enter the tested airflow in CFM per RA3.9.4.1 for each whole house fan installed in the house.
6. Enter the tested the Watts per RA3.9.4.2 for each whole house fan installed in the house.

**Section C2. Whole House Fan (WHF) Equipment Information** (This section is required if procedure in A01 uses a Revenue Meter)

1. Fan name will be auto populated from CF1R.
2. Enter the location where each whole house fan is installed in the house.
3. Enter the name of the manufacturer for each whole house fan installed in the house.
4. Enter the model number for each whole house fan installed in the house.
5. Enter the tested airflow in CFM per RA3.9.4.1 for each whole house fan installed in the house.
6. Enter the total tested Watts per RA3.9.4.2 for all whole house fans installed in the house.

**Section D. Whole House Fan Compliance Calculations**

1. This field is automatically populated from Section B.
2. This field is automatically populated from Section C.
3. This field is automatically populated from Section B.
4. This field is automatically calculated from section C.

**E. Compliance Statement**

To comply, the total installed whole house fan airflow must equal to or greater than the required airflow and the installed fan efficacy must be less than or equal to the required fan efficacy.

**F. Additional Requirements**

1. To qualify for the whole house fan compliance credit the installed whole house fan must be listed in Home Ventilating Institute Certified Products Directory, <https://www.hvi.org/hvi-certified-products-directory/>.
2. The homeowner shall be provided with user instructions documentation that describes the proper use of the whole house fan necessary to obtain the full energy savings benefit.
3. This must be a true statement to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

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ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.



## LOCAL MECHANICAL EXHAUST

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-32-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### CERTIFICATE OF INSTALLATION

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

Title 24, Part 6, Section 150.0(o) **Ventilation for Indoor Air Quality**. All dwelling units shall meet the requirements of ASHRAE Standard 62.2, Ventilation and Acceptable Indoor Air Quality in Residential Buildings, subject to the amendments specified in Section 150.0(o)1.

#### A. Local Mechanical Exhaust - General Information

01	Dwelling Unit Name	
02	Building Type	
03	Total Kitchen Floor Area	
04	Kitchen Average Ceiling Height	
05	Kitchen Total Conditioned Volume	
06	Kitchen Type	
07	Dwelling Unit Total Floor Area	
08	Kitchen Range (Cooking Stove) Fuel Type	

#### B. Local Mechanical Exhaust System (Section 150.0(o)1G) – Fan Selection and Duct Design Criteria for Compliance

Local mechanical exhaust fans shall be installed in each kitchen and bathroom in accordance with Section 150.0(o)1G. Systems shall be rated for airflow in accordance with ASHRAE 62.2 section 7.1. Delivered local ventilation rates:

- *All local ventilation rates have been measured using a flow hood, flow grid, or other airflow measuring device and meet the requirements of Tables 150.0-E, 150.0-F, or 150.0-G; OR*
- *The airflow rating at a pressure of 0.25 in. w.c. of a certified fan is assumed because the local ventilation system duct sizing meets the prescriptive requirements of Table 150.0-H.*

**Table 150.0-E  
Demand-Controlled Local Ventilation Exhaust Airflow Rates and Capture Efficiency**

Application	Airflow
Enclosed Kitchen or Nonenclosed Kitchen	Vented range hood, including appliance-range hood combinations shall meet either the capture efficiency (CE) or the airflow rate specified in Table 150.0-G as applicable.
Enclosed Kitchen or Nonenclosed Kitchen	Other kitchen exhaust fans, including downdraft: 300 cfm (150 L/s)
Bathroom	50 cfm (25 L/s)

**Table 150.0-F  
Continuous Local Ventilation Exhaust Airflow Rates**

Application	Airflow
Enclosed kitchen	5 ach, based on kitchen volume
Bathroom	20 cfm (10 L/s)

**Table 150.0-G  
Kitchen Range Hood Airflow Rates (cfm) and ASTM E3087 Capture Efficiency (CE) Ratings According to Dwelling Unit Floor Area and Kitchen Range Fuel Type**

Dwelling Unit Floor Area (ft <sup>2</sup> )	Hood Over Electric Range	Hood Over Natural Gas Range
>1500	50% CE or 110 cfm	70% CE or 180 cfm
>1000 - 1500	50% CE or 110 cfm	80% CE or 250 cfm
750 - 1000	55% CE or 130 cfm	85% CE or 280 cfm
<750	65% CE or 160 cfm	85% CE or 280 cfm

**Table 150.0-H  
Prescriptive Ventilation System Duct Sizing**

Fan Airflow Rating, CFM at minimum static pressure of 0.25 in. water	≤50 (25)	≤80 (40)	≤100 (50)	≤125 (60)	≤150 (70)	≤175 (85)	≤200 (95)	≤250 (120)	≤350 (165)	≤400 (190)	≤450 (210)	≤700 (330)	≤800 (380)
Duct Type	Minimum Duct Diameter, in. (mm) <sup>a,b</sup>												
Rigid duct	4 <sup>e</sup> (100)	5 (125)	5 (125)	6 (150)	6 (150)	7 (180)	7 (180)	8 (205)	9 (230)	10 (255)	10 (255)	12 (305)	12 <sup>d</sup> (305)
Flex duct <sup>c</sup>	4 (100)	5 (125)	6 (150)	6 (150)	7 (150)	7 (180)	8 (205)	8 (205)	9 (230)	10 (255)	NP	NP	NP

a. For noncircular ducts, calculate the diameter as four times the cross-sectional area divided by the perimeter.

b. NP = application of the prescriptive table is not permitted for this scenario.

c. Use of this table for verification of flex duct systems requires flex duct to be fully extended and any flex duct elbows to have a minimum bend radius to duct diameter ratio of 1.0.

d. For this scenario, use of elbows is not permitted.

e. For this scenario, 4 in. (100 mm) oval duct shall be permitted, provided the minor axis of the oval is greater than or equal to 3 in. (75 mm)

f. When a vented range hood utilizes a capture efficiency rating to demonstrate compliance with 150.0(o)1Giib, a static pressure greater than or equal to 0.25 in. of water at the rating point shall not be required, and the airflow listed in the approved directory corresponding to the compliant capture efficiency rating point shall be applied to Table 150.0-H for determining compliance.



## LOCAL MECHANICAL EXHAUST

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-MCH-32-H

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

### C. Kitchen Exhaust Systems

01	02	03	04	05	06	07	08	09a	09	10a	10	11	12
System Name	Manufacturer Name	System Type	HVI or AHAM Directory Listed Model Number	HVI or AHAM Directory Listed Rated Airflow	HVI or AHAM Directory Listed Sound Rating	Minimum Airflow (defaults to rated airflow)	Operation Schedule	Method of Compliance	Required Minimum Ventilation Rate	Exception to Maximum Sound Rating	Maximum Sound Rating	Compliance Statement for Airflow	Compliance Statement for Sound

### D. Continuous Kitchen Exhaust

01	Total Continuous Ventilation Airflow	
02	Required Minimum Continuous Ventilation Airflow	
03	Compliance Statement	

### E. Kitchen Range Hood Capture Efficiency Option

01	Manufacturer Name	
02	CEC-Approved Directory Listed Model Number	
03	CEC-Approved Directory Listed Rated Capture Efficiency	
04	Required Minimum Capture Efficiency ( <i>Table 150.0-G</i> )	
05	Compliance Statement	

### F. Other Requirements

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

*The items listed below correspond to the information given in Section 150.0(o)1G. Refer also to Chapter 4.6 of the Residential Compliance Manual for information describing these requirements in more detail. The signature of the Responsible Person in the declaration statement below certifies that the building complies with these requirements if applicable.*

01	Demand control exhaust systems shall be provided with at least one of the following: 1. A readily accessible occupant-controlled on-off control. 2. An automatic control that does not impede occupant on control.
02	Nonenclosed kitchens shall be provided with a demand-controlled mechanical exhaust system.
03	Each continuous mechanical exhaust system shall be provided with a readily accessible manual on-off control. (Multifamily dwellings are exempt from readily accessible requirement.)
04	Continuous mechanical exhaust systems shall be designed to operate during all occupiable hours.
05	Exhaust fans in separate dwelling units shall not share a common exhaust duct. Exhaust inlets from more than one dwelling unit may be served by a single exhaust fan downstream of all the exhaust inlets if the fan is designated and intended to run continuously or if each inlet is equipped with a back-draft damper to prevent cross-contamination when the fan is not running.

Registration Number:

Registration Date/Time:

ECC Provider:

CA Building Energy Efficiency Standards - 2025 Single-Family Compliance

January 1, 2026

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-32-H User Instructions

### Section A. Local Mechanical Exhaust - General Information

1. Dwelling Unit Name: This field is filled out automatically and referenced from the MCH-01
2. Building Type: This field is filled out automatically and referenced from the CF1R.
3. Total Kitchen Floor Area: Enter the total floor area for an enclosed kitchen or N/A for a non-enclosed kitchen.
4. Kitchen Average Ceiling Height: Enter the kitchen ceiling height for an enclosed kitchen or N/A for a non-enclosed kitchen.
5. Kitchen Total Conditioned Volume: This field is filled out automatically and calculated based on the kitchen area and ceiling height.
6. Kitchen Type: Enter the type of kitchen (enclosed or non-enclosed).
7. Dwelling Unit Total Floor Area: This field is filled out automatically and referenced from the MCH-01.
8. Kitchen Range Fuel Type: Select the fuel type of the kitchen range.

### Section C. Kitchen Exhaust System

1. System Name: Enter a unique name for the kitchen exhaust system
2. Manufacturer Name: Enter manufacturer name for the kitchen exhaust system.
3. System Type: Select the type of kitchen exhaust system. Options are vented range hood, downdraft, and other.
4. HVI or AHAM Directory Listed Model Number: Enter the kitchen exhaust system model number matching the installed equipment and HVI or AHAM directory.
5. HVI or AHAM Directory Listed Rated Airflow: Enter the rated airflow listed in the HVI or AHAM directory for the above model number.
6. HVI or AHAM Directory Listed Sound Rating: Enter the sound rating listed in the HVI or AHAM directory for the above model number.
7. Minimum Airflow (defaults to rated airflow): Defaults to rated airflow from HVI directory, but editable if exhaust system minimum airflow rate is less than HVI listed value.
8. Operation Schedule: Select the kitchen exhaust system operation schedule. Options are demand control and continuous.
- 9a. Method of Compliance: Select the method of compliance. Options are airflow and capture efficiency.
9. Required Minimum Ventilation Rate (if demand controlled): This field is filled out automatically and is calculated based on the system operation schedule and type, and kitchen type and volume, and Table 150.0-E and Table 150.0-G. This field is only used for demand control exhaust systems. Continuous exhaust required minimum ventilation rate is determined in Section D.
- 10a. Exception to Maximum Sound Rating: User select: No Exception or Remote mounted fan with min. 4-ft of duct between fan and intake grille.
10. Maximum Sound Rating: This field is filled out automatically and is calculated based the system operation schedule and minimum airflow.
11. Compliance Statement for Airflow: This field is filled out automatically based on the installed system listed airflow rate and minimum required ventilation rate. This field only determines compliance using airflow ratings for demand-controlled kitchen exhaust systems. Continuous system ventilation rate compliance is determined in Section D. Vented range hoods utilizing the capture efficiency rating for compliance is determined in Section E.
12. Compliance Statement for Sound. This field is filled out automatically based on the installed system listed sound rating and maximum sound rating allowed.

**Section D. Continuous Kitchen Exhaust**

1. Total Continuous Ventilation Airflow: This field is filled out automatically and is equal to the sum of the listed airflow for all continuously operated kitchen exhaust systems.
2. Required Minimum Continuous Ventilation Airflow: This field is filled out automatically and is equal to five times the enclosed kitchen volume.
3. Compliance Statement: This field is filled out automatically and is based on the total installed continuous ventilation airflow and the required minimum continuous ventilation airflow.

**Section E. Kitchen Range Hood Capture Efficiency Option**

**Note: This table is used only when complying with local exhaust requirements by utilizing the capture efficiency rating instead of the airflow rating.**

1. Manufacturer Name: Enter manufacturer name for the kitchen range hood.
2. CEC-Approved Directory Listed Model Number: Enter the kitchen range hood model number matching the installed equipment and a CEC-approved directory listing.
3. CEC-Approved Directory Listed Rated Capture Efficiency: Enter the rated capture efficiency in the CEC-approved directory for the above model number.
4. Required Minimum Capture Efficiency: This field is filled out automatically and is determined by the dwelling unit square footage, kitchen range fuel type, and Table 150.0-G.
5. Compliance Statement. This field is filled out automatically based on the installed system listed capture efficiency rating and required minimum capture efficiency.

**Section F. Other Requirements**

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. VCHP System Information**

Procedures for verification of VCHP compliance credit eligibility are described in the Energy Code Reference Appendices Section RA3.4.4.3.

01	SC System ID/Name from CF1R	
02	SC System Description of Area Served	
03	Conditioned Floor Area Served by the System (ft <sup>2</sup> )	
04	Status: Refrigerant charge verification from MCH-25	
05	Verification: Is conditioned airflow supplied to all habitable rooms in accordance with the procedure in RA3.1.4.1.7?	
Notes:		

**B. VCHP Indoor Unit Information**

Ducted indoor units are required to be certified to the Energy Commission as low static systems, and included in the list of certified indoor units published on the Energy Commission website at the following URL: <https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency/manufacturer-certification-building-equipment>.

01	02	03	04	05	06	07	08	09
Indoor Unit Name or Description of Area Served	Installed Indoor Unit Type	Indoor Unit Duct Status	Conditioned Floor Area Served By The Indoor Unit (ft <sup>2</sup> )	Number of Air Filter Devices on Indoor Unit	Indoor Unit Required Minimum System Airflow Rate (cfm)	Status: Airflow Rate Verification from MCH-23	Is Field Verification of Default Non-Continuous Fan Operation Required?	Verification: Is Ducted Low Static Indoor Unit Certified to CEC?
Notes:								



## VARIABLE CAPACITY HEAT PUMP COMPLIANCE CREDIT

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****C. Verification: Ducted Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.3.8**

Ducted indoor units shall be verified in accordance with the Verified Low Leakage Ducts in Conditioned Space procedure in Section RA3.1.4.3.8.

01	02	03	04
Indoor Unit Name or Description of Area Served	A Visual Inspection Shall Confirm the Space Conditioning Distribution System Location(RA3.1.4.1.3)	Measured Duct Leakage to Outside (cfm) Using RA3.1.4.3.4	Compliance Statement:
Notes:			

**D. Verification: Ductless Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.1.8**

A visual inspection shall confirm that ductless indoor units are located entirely in conditioned space in accordance with the procedures of RA3.1.4.1.8.

01	02	03
Indoor Unit Name or Description of Area Served	Indoor Unit Installation Location Verification	Compliance Statement:
Notes:		

**E. Verification: Wall Mounted Thermostats - RA3.4.5**

Field verification according to the procedure in RA3.4.5 shall confirm that VCHP space conditioning zones that are greater than 150 ft<sup>2</sup>, are controlled by a permanently installed wall-mounted thermostat.

01	02	03	04	05
Indoor Unit Name or Description of Area Served	Is a Wall-mounted Thermostat Installed in the Zone Served by the Indoor Unit?	Does the Thermostat Control the Zone's Indoor Unit?	Is the Thermostat Mounted Permanently to the Wall?	Compliance Statement:
Notes:				

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Verification: Non-Continuous Fan Operation - RA3.4.6**

If the certificate of compliance indicates non-continuous indoor unit fan operation was specified for compliance credit, then the system shall be field verified in accordance with the procedures in RA3.4.6 to confirm that the installed system's indoor unit + outdoor unit combination does not operate the fan continuously when the system thermostat is not calling for conditioning.

01	02	03	04	05
Indoor Unit Name or Description of Area Served	Is Non-Continuous Default Fan Operation Shown in CEC Certification Listings?	Does Indoor Unit Air Distribution Fan Operate When There Is No Call For Heating?	Does Indoor Unit Air Distribution Fan Operate When There Is No Call For Cooling?	Compliance Statement:
Notes:				

**G. Verification: Installed Air Filter Sizing and Pressure Drop - RA3.1.4.7 and RA3.1.4.8**

Nominal 2-inch or greater depth air filters shall be sized by the system designer to accommodate a maximum allowable clean-filter pressure drop of 0.1 inch W.C. at the air filter's design airflow rate as verified according to the procedures in RA3.1.4.8. Nominal one-inch minimum depth air filters shall be allowed if the filter face area is sized based on a maximum face velocity of 150 ft per minute at the air filter design airflow rate according to the procedures in RA3.1.4.7. In order to inform the occupant of the airflow and clean filter pressure drop performance required for replacement air filters, the installer shall place a sticker in or near the filter grille displaying the air filter design airflow rate and the maximum allowed clean filter pressure drop at the design airflow rate as required by Standards Section 150.0(m)12Biv.

01	02	03	04	05	06	07	08	09	10	11	12
Indoor Unit Name or Description of Area Served	Air Filter Name or Description of Location	Air Filter Device Type	Design Airflow Rate for Air Filter Device (cfm)	Air Filter Nominal Depth (inch)	Air Filter Nominal Length (inch)	Air Filter Nominal Width (inch)	Air Filter Calculated Nominal Face Area (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Air Filter Rated Pressure Drop at Design Airflow Rate (inch W.C.)	Air Filter Pressure Drop Compliance
Notes:											

**H. VCHP System Compliance Statement**

01	
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

**CF2R-MCH-33-H User Instructions****Section A. VCHP System Information**

1. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from the CF2R-MCH-25 which must be completed prior to this document.
5. Perform the verification specified by RSC3.1.4.1.7 and select the value that describes the result of the verification.

**Section B. VCHP Indoor Unit Information**

1. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
4. Enter the conditioned floor area served by the indoor unit - a value in ft<sup>2</sup>.
5. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the CF2R-MCH-23 which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the CF2R-MCH-23 which must be completed prior to this document.
8. This field is filled out automatically. It is referenced from the Certificate of Compliance which must be completed prior to this document.
9. Navigate to the URL for the Manufacturer certification listings and determine whether the installed system is included in the CEC listing, then select the value that describes the result of the verification.

**Section C. Verification: Ducted Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.3.8**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the statement that best describes the location of the ducted distribution system.
3. Enter the leakage to outside airflow determined from the RA3.1.4.3.8
4. This field is filled out automatically

**Section D. Verification: Ductless Indoor Units Located Entirely in Directly Conditioned Space - RA3.1.4.1.8**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the statement that best describes the indoor unit installation location as determined according to RA3.1.4.1.8.
3. This field is filled out automatically

**Section E. Verification: Wall Mounted Thermostats - RA3.4.5**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Answer yes or no to the question: Is a wall-mounted thermostat installed in the zone served by the indoor unit?
3. Answer yes or no to the question: Does the thermostat control the zone's indoor unit?
4. Answer yes or no to the question: Is the thermostat mounted permanently to the wall?
5. This field is filled out automatically

**Section F. Verification: Non-Continuous Fan Operation RA3.4.6**

1. This field is filled out automatically. It is referenced from a different section of this document.
2. Select the best response to the question: Is non-continuous default fan operation shown in CEC certification listings?
3. Select the best response to the question: Does indoor unit air distribution fan operate when there is no call for heating?
4. Select the best response to the question: Does indoor unit air distribution fan operate when there is no call for cooling?
5. This field is filled out automatically

**Section G. Verification: Installed Air Filter Sizing and Pressure Drop - RA3.1.4.7 and RA3.1.4.8**

1. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
3. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
4. This field is filled out automatically. It is referenced from another section on this document, or from the CF2R-MCH-01 which must be completed prior to this document.
5. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
6. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
7. This field is filled out automatically. It is referenced from the CF2R-MCH-01 which must be completed prior to this document.
8. This field is filled out automatically by calculating the product of air filter length and air filter width.
9. This field is filled out automatically based on the depth of the filter.
10. This field is filled out automatically
11. Input the pressure drop at the design airflow rate from the performance data information published on the air filter label.
12. This field is filled out automatically

**Section H. VCHP System Compliance Statement**

1. This field is filled out automatically.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Pre-Cooling Verification**

01	02	03
SC System ID/Name from CF1R	Thermostat Type	Pre-Cooling

**B. Mandatory Requirements for Occupant Controlled Smart Thermostats**

Below is a list of required functional specifications and behaviors. Consult Joint Appendix JA5 for more information.

01	<b>Setback Capabilities.</b> An OCST shall meet the requirements of Section 110.2(c). Thermostats for heat pumps shall also meet the requirements of Section 110.2(b).
02	<b>Restart Settings.</b> In the event of a disruption of power to the device that results in power off or restart, upon device restart, the device shall automatically restore the most recently programmed settings, including reconnection to a network, if the device was previously enabled and network connectivity is available.
03	<b>Automatic Rejoin.</b> AN OCST shall connect and remain connected in its communication path and control end point. The OCST shall incorporate an automatic rejoin function. When physical and/or logical communication is lost, the OCST shall trigger its automatic rejoin function to restore the physical and/or logical communication.
04	<b>Event Responses.</b> Event response, unless overridden by the occupant or modified by an energy management control system or service, may be triggered by price signals or Demand Response Signals. The OCST shall provide one set of event responses for price signals and one set of event responses for Demand Response Signals. The responses may be common for both types of events.
05	<b>User Display and Interface.</b> The OCST shall have the capability to display information to the user.
06	<b>Require Functional Behavior.</b> (a) <i>Normal Operation.</i> Normal operation of an OCST is defined to be the OCST's prevailing mode of operation as determined by the occupant's prior settings and use of features provided by the OCST manufacturer's design. Aspects of normal operation of an OCST may be modified or interrupted in response to occupant subscribed price signals or when Demand Response Periods are in progress, but only to the extent specified by the occupants or their representatives. (b) <i>Demand Responsive Control.</i> Upon receiving a price signal or a Demand Response Signal, OCSTs shall be capable of automatic event response by adjusting the currently applicable temperature set point by the number of degrees indicated in the temperature offset (heating or cooling, as appropriate).
07	<b>HVAC System Interface.</b> HVAC wiring terminal designations shall be clearly labeled.

**C. Compliance Statement**

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-MCH-34-E User Instructions

### A. Pre-Cooling Verification

1. This field is filled out automatically. It is referenced from the Certificate of Compliance (CF1R), which must be completed prior to this document.
2. This field is filled out automatically. It is referenced from the Certificate of Installation (CF2R-MCH-01), which must be completed prior to this document.
3. States “capable” for all systems listed.

### B. Mandatory Requirements for Occupant Controlled Smart Thermostats

This table lists the requirements for all occupant controlled smart thermostats. Installer must ensure all the requirements in this table are met.

### C. Compliance Statement

To comply, the total installed whole house fan airflow must equal to or greater than the required airflow and the installed fan efficacy must be less than or equal to the required fan efficacy.

### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note: This table completed by ECC Registry.**

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Design Dwelling Unit Water Heating Systems Information (other than HPWH)**

This table reports features of the water heating system(s) other than HPWH systems specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	07	08	09	10
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Dwelling Unit DHW System Distribution Type	Compact Distrib.

**A2. Design Dwelling Unit HPWH System Information**

This table reports the water heating system(s) that were specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	06a	07	08	09
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Tank Volume	Dwelling Unit DHW System Distribution Type	Compact Distribution	Simulated Equipment Make and Model

**B. Installed Dwelling Unit Water Heating Systems Information**

This table reports features of the water heating system other than HPWH systems installed in this project.

01	02	03	04	05	06	07	08	09	10
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Dwelling Unit DHW System Distribution Type	Compact Distrib.



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**B2. Installed Dwelling Unit HPWH System Information**

This table reports the water heating system(s) installed in this project.

01	02	03	04	05	06	06a	07	08
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Tank Volume	Dwelling Unit DHW System Distribution Type	Compact Distribution

**C. Design Dwelling Unit Water Heating Efficiency Information**

This table reports the water heater(s) efficiency features specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank Location

**D. Installed Dwelling Unit Water Heating Efficiency Information**

This table reports the water heater(s) efficiency features installed in this project.

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank Location

**E. Installed Water Heater Manufacturer Information**

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Mandatory Measures for Single Dwelling Systems**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
02	Unfired storage tanks are insulated with an external R-3.5 or combination of R-16 internal and external Insulation. (Section 110.3(c)3).
03	<p>Domestic hot water piping insulation requirements (Section 150(J)):</p> <ul style="list-style-type: none"> <li>• All domestic hot water piping shall be insulated as specified in Section 609.12 of the California Plumbing Code. Insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.</li> <li>• Pipe insulation shall fit tightly and all elbows and tees shall be fully insulated.</li> <li>• Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.</li> <li>• Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.</li> <li>• Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation shall not be required to have pipe insulation.</li> </ul>
04	<p>For Gas or Propane Water Heaters: Ensure either a or b are installed (Section 150.0(n))</p> <p>a) designated space at least 2.5 feet by 2.5 feet and 7 feet tall within 3 feet from the water heater</p> <ul style="list-style-type: none"> <li>• A dedicated 125V, 20A electrical receptacle connected to the electric panel with a 120/240V 3 conductor, branch circuit rated at 30 amps minimum, within 3 feet from the water heater and is accessible with no obstructions;</li> <li>• The conductor shall be labeled with the word "Spare" on both ends; and</li> <li>• A reserved single pole circuit breaker space next to the circuit breaker next to the branch circuit labeled "Future 240V use" shall be provided.</li> <li>• A condensate drain no more than 2 inches higher than the base of the water heater, and allows natural draining without pump assistance.</li> </ul> <p>b) A designated space at least 2.5 feet by 2.5 feet and 7 feet tall more than 3 feet from the water heater</p> <ul style="list-style-type: none"> <li>• A dedicated 240 volt branch circuit shall be installed within 3 feet from the designated space. The</li> <li>• branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as "240V ready"; and</li> <li>• The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future HPWH installation. The reserved space shall be permanently marked as "For Future 240V use"; and</li> <li>• Either a dedicated cold water supply, or the cold water supply shall pass through the designated HPWH location just before reaching the gas or propane water heater; and</li> <li>• The hot water supply pipe coming out of the gas or propane water heater shall be routed first through the designated HPWH location before serving any fixtures; and</li> <li>• The hot and cold water piping at the designated HPWH location shall be exposed and readily accessible for future installation of a HPWH; and</li> <li>• A condensate drain no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.</li> </ul>
05	<p>For Air-Source Heat Pump Water Heaters (HPWH), the following shall be met (Section 110.3(c)7)</p> <p>A. Backup heat is required when inlet air is unconditioned, unless the compressor cutout cut-off temperature is below the Heating Winter Median of Extreme. Backup heat may be internal or external to the HPWH</p> <p>B. Meet <b>one</b> of the ventilation requirements below. Minimum volume and opening size requirements shall be the sum of all HPWHs installed within the same space. Compressor capacity shall be determined using AHRI 540 Table 4 reference conditions for refrigeration with the "High" rating test point:</p> <p>a. Installed using a method provided by the manufacturer to meet or exceed the level of performance provided by the ventilation requirements of Section 110.3(c)7B2 through Section 110.3(c)B4.</p> <p>b. For HPWH installation without ducts, the installation space shall have a volume not less than the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method; or</p> <p>c. For HPWH installation without ducts, the installation space shall be vented to a communicating space via permanent openings, according to the following requirements:</p> <ol style="list-style-type: none"> <li>i. Communicating space shall meet the minimum volume of Section 110.3(c)7B12 above, minus the volume of the HPWH installation space; and</li> <li>ii. Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum Net Free Area (NFA) the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent openings shall be fully louvered doors or two openings of equal area, one in the upper half of the enclosure and one in the bottom half of the enclosure. The top of the upper opening must be 12 inches or less from the enclosure top and the bottom of the lower vent must be 12 inches or less from the enclosure bottom; or</li> </ol>

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	<p>d. For HPWH installations with ducts, the following requirements shall be met:</p> <ul style="list-style-type: none"> <li>i. The space joined to the installation space via ducts shall meet the minimum volume of Section 110.3(c)7B2 above, minus the volume of the HPWH installation space; and</li> <li>ii. All duct connections and building penetrations shall be sealed; and</li> <li>iii. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to minimum of R-6; and</li> <li>iv. Where only the HPWH inlet or outlet is ducted, installation space shall include permanent openings which consist of a single layer of fixed flat slat louvers or grilles in the bottom half of the room, and/or a door undercut. With a ducted inlet, the minimum NFA shall be equal to the cross-sectional area of the duct. With a ducted exhaust, the minimum NFA shall be the larger of 20 square inches or the minimum NFA provided by the manufacturer for this method; and</li> <li>v. Where the inlet and outlet ducts both terminate within the same pressure boundary, airflow from the termination points shall be diverted away from each other.</li> </ul>
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**Compact Hot Water Distribution (RA4.4.6)**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor

**H. Central Parallel Piping Requirements (RA4.4.4)**

Systems that utilize this distribution type shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Each central manifold has 15 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For instance, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in TABLE 120.3-A-1.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****I. Point of Use Requirements (POU) (RA4.4.5)**

Systems that utilize this distribution type shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	All hot water supply pipe run lengths are equal to or less than the maximum values shown below, based on the pipe diameter. If a combination of piping is used in a single run, then one half the allowed length of each size is the maximum installed length. The maximum allowed length of piping for the longest run terminating in:
	3/8 inch - For only one pipe size - max length allowed is 15 feet For combination pipe sizes the max allowed length of 3/8-inch piping is 7.5 feet, of 1/2 inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.
	1/2 inch - For only one pipe size – max length allowed is 10 feet For combination pipe sizes the allowed length of 1/2-inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.
	3/4 inch - For only one pipe size = 5 feet

**J. Mandatory Requirements for all Recirculation Systems (RA4.4.7)**

Systems that utilize a recirculation system shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	A check valve located between the recirculation pump and the water heater to prevent unintentional recirculation.
02	Piping must take the most direct path between water heater and fixtures.
03	Insulation is not required on the cold water line when it is used as the return.
04	If more than one loop is installed, each loop shall have its own pump and controls.

**K. Recirculation Non-Demand Controls Requirements (RA4.4.8)**

Systems that utilize this distribution type shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The active control shall be either: timer, temperature, or time and temperature. Timers shall be set to less than 24 hours. The temperature sensor shall be connected to the piping and to the controls for the pump.
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****L. Demand Recirculation; Manual Control (RA4.4.9)/Sensor Control (RA4.4.10) Requirements**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

Systems that utilize either of these distribution types shall comply with these requirements.

01	The system operates "on-demand", meaning that the pump begins to operate shortly before or immediately after hot water draw begins, and stops when the return water temperature reaches a certain threshold value. For Demand Recirculation Manual Control, the pump shall be turned on using a manual switch system. For Demand Recirculation Sensor Control, the pump shall be turned on using a sensor system.
02	The controls shall be located in the kitchen, bathroom, and any hot water fixture location that is at least 20 feet from the water heater.
03	Manual controls may be activated by wired or wireless mechanisms. Each control shall have standby power of 1 Watt or less.
04	Sensor controls may be activated by wired or wireless mechanisms, including buttons, motion sensors, door switches and flow switches. Each control shall have standby power of 1 Watt or less.
05	Pump and control placement shall meet one of the following criteria: <ul style="list-style-type: none"><li>• When a dedicated return line has been installed the pump, controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop; or</li><li>• The pump and controls are installed on the dedicated return line near the water heater and the thermo-sensor is installed in an accessible location as close to the end of the supply portion of the recirculation loop as possible; or</li><li>• When the cold water line is used as the return, the pump, demand controls and thermo-sensor shall be installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).</li></ul>
06	After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises to one of the following values: <ul style="list-style-type: none"><li>• Not more than 10°F (5.6°C) above the initial temperature of the water in the pipe; or</li><li>• Not more than 102°F (38.9°C).</li></ul>
07	Controls shall limit operation to no more than 5 minutes following activation.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

**CF2R-PLB-02-E User Instructions****A. Design Dwelling Unit Water Heating Systems Information**

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

**A2. Design Dwelling Unit HPWH System Information**

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

**B. Installed Dwelling Unit Water Heating Systems Information**

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name - Reference information from Table A.
2. Water Heating System ID or Name – Reference information from Table A.
3. Water Heating System Type – Reference information from Table A. The different kinds of water heating system type are DHW, or Combined Hydronic.
4. Water Heater Type – Reference information from Table A. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
5. # of Like (or Identical) Water Heaters in system – Reference information from Table A.
6. Fuel Type – Reference information from Table A. The different kinds of fuel types are heat pump, electric resistance, natural gas, and propane.
7. Rated Input Type – Reference information from Table A. For natural gas and propane, the input type is Btu/hr. For heat pump and electric resistance the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the CF1R.
9. Dwelling Unit DHW System Distribution Type - Reference information from Table A.
10. Compact Distribution - Reference information from Table A.

**B2. Installed Dwelling Unit HPWH System Information**

This table reports the water heating system information that is being installed. Require one line for each installed water heater. Not applicable for central systems.

1. Dwelling Unit Name – Reference information from Table A2.
2. Modeled Equipment Make and Model – User input must be equal to the value indicated on Table A2 as default and allow user to override with an equivalent system based on the simulated equipment in Table A2. A2 as default and allow user to override with an equivalent system based on the simulated equipment in Table A2.04
3. Water Heating System ID or Name – Reference information from Table A2.
4. # of Like (or Identical) Water Heaters in System – Reference information from Table A2.

5. Tank Location – User input. Must be equal to value indicated in Table A2.
6. Exterior Tank Insulation R-value – User input. Must be equal to or higher than value indicated in Table A2.
- 6a. Tank Volume – User input must equal reference information on Table A2.
7. Dwelling Unit DHW System Distribution Type –Reference information from Table A2.
8. Compact Distribution — Reference information from Table A2.

### C. Design Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

### D. Installed Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system efficiency features installed in this project.

1. Water Heating System ID or Name – Reference information from Table C.
2. Heating Efficiency Type – Reference information from Table C. Different efficiency types are: Energy Factor, AFUE, UEF and Thermal Efficiency.
3. Heating Efficiency Value – User input must be equal to or higher efficiency than value indicated on Table C.
4. Standby Loss – User input. Must be equal to or less than value indicated in Table C. Value may be N/A if CF1R value is N/A.
5. Exterior Insulation R-Value – User input. Must be equal to or higher than value indicated in Table C. Value may be N/A if CF1R value is N/A.
6. Water Heater Storage Volume (gal) – User input. Must be equal to the value indicated in Table C. Value may be N/A if water heater type is instantaneous with zero storage.
7. Tank location – User input. Must be equal to value indicated in Table C.

### E. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater. Not applicable for central systems.

1. Water Heating System ID or Name – Reference information from Table B or B2.
2. Manufacturer – User input. Enter the name of the water heater manufacturer.
3. Model Number – User input. Enter the model number of the water heater.

### F. Mandatory Measures for Single Dwelling Systems

This table lists the requirements for all DHW systems. ECC rater must ensure all the requirements on this table are met.

### G. Compact Hot Water Distribution

If performance compliance is used, this table lists the values used in the performance calculation and require no user input.

If prescriptive compliance is used, fill out this table.

1. Dwelling Name. Reference information from Table A2.
2. Enter the master bath distance of furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.

3. Enter the kitchen distance from furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.
4. Enter furthest third fixtures from fixture to water heater in feet. For multiple water heaters, enter the average of the furthest distance of each water heater.
5. Weighted Distance - Calculated value – no user input required.
6. Qualification Distance - Calculated value – no user input required.

#### H. Central Parallel Piping Requirements

This table only applies to systems indicated as **Parallel Piping**. In addition to the mandatory requirements in Table J, the installer must ensure the requirements in this table are met.

#### I. Point of Use Requirements

This table only applies to systems indicated as **Point of Use**. In addition to the mandatory requirements in Table J, the installer must ensure the requirements in this table are met.

#### J. Mandatory Requirements for all Recirculation System

The requirements of this table apply to all recirculation systems listed below.

#### K. Recirculation Non-Demand Controls Requirements

This table only applies to systems indicated as **Recirculation Non-demand Controls**. In addition to the mandatory requirements in Table J and M, the installer must ensure the requirements in this table are met.

#### L. Demand Recirculation Manual Control/Sensor Control Requirements

This table only applies to systems indicated as **Demand Recirculation Manual Control** or **Demand Recirculation Sensor Control**. In addition to the mandatory requirements in Table H and K, the installer must ensure the requirements in this table are met.

#### Documentation Declaration Statements

1. The person who prepared the CF2R 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.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Pool and Spa System Type**

01	Pool and Spa System Type	
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**B. Pool and Spa Systems and Equipment Requirements (Section 110.4(a) and 110.5)*****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	A pool or spa heating system or equipment subject to State or federal appliance efficiency standards shall comply with the applicable provisions of Section 110.1A.
02	A readily accessible on-off switch is mounted on the outside of the heater, which allows the heater to be shut off without the user adjusting the thermostat setting.
03	A weatherproof plate or card providing the energy efficiency rating and instructions for the energy-efficient operation of the pool and/or spa heater is permanently mounted and easily readable.
04	Heating system has no pilot light.

**C. Pool and Spa System Installation Requirements (Section 110.4(b))*****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Equipment installed to heat water for pools and/or spas shall be selected from equipment meeting the standards shown in Table 110.4-A.
02	At least 18 inches of horizontal or vertical pipe shall be installed between the filter and the heater or dedicated suction and return lines, or built-in or built-up connections shall be installed to allow for future solar heating equipment are provided.
03	Outdoor pools and/or spas with electric or gas heating equipment shall be installed with a pool cover.
04	Pool system has directional inlets to adequately mix the pool water.
05	Pool system has a permanent time switch that allows all pumps to be set or programmed to run during off-peak periods only, and for the minimum time necessary to maintain the water in the condition required by applicable public health standards

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****D. Pool and Spa System Heating Source Sizing Requirements (Section 110.4(c))**

01	Total Pool or Spa surface area (ft <sup>2</sup> )	
02	Method of Compliance	
03	Qualifying Exceptions to Section 110.4(c)	
04	This project requires a solar pool heating system with a solar collector surface area that is equivalent to 60 percent or greater of the pool and/or spa surface area. The minimum solar collector surface area required.	
05	This project requires a Heat Pump Pool Heater (HPPH) as the primary heat source. The HPPH shall be sized according to the HPPH manufacturer's specifications. If the HPPH manufacturer's specifications do not include information on HPPH sizing, use the sizing provisions in Reference Joint Appendix JA16.3. The supplementary heater can be of any energy source.	
06	This project requires an on-site renewable or on-site recovery energy source that provides at least 60 percent of the calculated annual energy consumption of the pool and/or spa heater. The mechanical engineer or responsible person shall provide documentation and submit together with this CF2R.	
07	This project requires a combination solar pool heater and heat pump pool heater. The system shall have no additional supplementary heater.	
08	The system shall be verified as an CEC Executive Director approved alternative.	
09	The responsible person shall provide documentation for the qualifying exception and submit together with this CF2R.	

**E. Controls for Heat Pump Pool Heaters with Supplementary Heating Requirements (Section 110.4(c))**

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Supplementary heater shall not operate when the heating load can be met by the heat pump pool heater alone; and
02	The cut-on temperature for heat pump heating is higher than the cut-on temperature for supplementary heating, and the cut-off temperature for heat pump heating is higher than the cut-off temperature for supplementary heating

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****F. Pool Pump Sizing and Flow Rate Specification (Section 150.0(p))*****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	Dedicated-purpose pool pumps and replacement dedicated-purpose pump motors subject to State or federal appliance efficiency standards shall be listed in the CEC's directory of certified equipment. Dedicated-purpose pool pumps shall meet the applicable standards set forth in 20 CCR § 1605.1(g)(7) of the Appliance Efficiency Regulations. Replacement dedicated-purpose pool pump motors shall meet the applicable standards set forth in 20 CCR § 1605.3 of the Appliance Efficiency Regulations			
02	The pool pump flow rate shall not exceed the maximum pump flow rate calculated based on pool sizing in the table below. The return pipe diameter, suction pipe diameter, and filter area shall be at least as large as the required minimums shown in the table. Alternatively, a flow calculation or flow test result shall be provided to demonstrate that the pump flow rate is less than 6 hour filtration turnover, and the return pipe flow rate does not exceed 8 fps and that the suction pipe flow rate does not exceed 6 fps.			
03	An alternative compliance calculation or a flow test result is provided for this pool or spa use (must attach flow calculation or flow test result to this form)			
04	Dedicated-purpose pool pumps with more than one speed shall have controls which default to the filtration flow rate when no auxiliary pool loads are operating.			
05	For dedicated-purpose pool multispeed pumps with more than one speed, the controls shall default to the filtration flow rate setting within 24 hours and shall have an override capability for servicing.			
06	Volume of Pool (gallons)			
07	Filter Type (Cartridge, Sand, DE)			
	08a Required Min Return Pipe Diameter (inches)	08b Required Min Suction Pipe Diameter (inches)	08c Required Min Filter Area (ft <sup>2</sup> )	08d Required Max Pump Flow (gpm)
09	Return Pipe Diameter (inches)			
10	Suction Pipe Diameter (inches)			
11	Filter Surface Area (ft <sup>2</sup> )			
12	Max Pump Flow Rate (gpm)			
13	Measured Flow Rate Return Line (fps)			
14	Measured Flow Rate Suction Line (fps)			
15	Compliance Statement:			

**G. Pool System Piping (Section 150.0(p)2)*****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The suction side pipe is straight for at least 4 pipe diameters before entering the pump (See table below for the required straight run lengths for various pipe sizes).
02	All elbows are sweep elbows, or an elbow type that has a pressure drop that is less than the pressure drop of a straight pipe with a length of 30 pipe diameters.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****H. Pool Filters and Valves** (Section 150.0(p)3 and 4)

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	If a filter is used in a pool intended for public use: The size of the filter is at least the size specified in NSF/ANSI 50.
02	If a backwash valve is used: The diameter of the backwash valve is at least 2 inches, or the diameter of the return pipe, whichever is greater.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

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

## CF2R-PLB-03-E User Instructions

### A. Pool and Spa System Type

Pick from Pool only, Spa only, or Pool and Spa

### B. Pool and Spa Systems and Equipment Requirements (Section 110.4(a) and 110.5)

Before any pool or spa heating system or equipment may be installed, the manufacturer must certify to the Energy Commission that the system or equipment complies with §110.4 and §110.5. The requirements include minimum heating efficiency according to Appliance Efficiency Regulations, an on-off switch outside the heater, permanent and weatherproof operating instructions, no continuous pilot light.

### C. Pool and Spa System Installation Requirements (Section 110.4(b))

A permanent time switch or similar control mechanism must be installed as part of the pool water circulation control system that will allow all pumps to be set or programmed to run only during the off-peak electric demand period and for the minimum time necessary to maintain the water in the condition required by applicable public health standards.

### D. Pool and Spa System Heating Source Sizing Requirements (Section 110.4(c))

This table lists the requirements for Pool and Spa System Heating Source Sizing. Pick from Method of Compliance list and Qualifying Exceptions to Section 110.4(c) list.

### E. Controls for Heat Pump Pool Heaters with Supplementary Heating Requirements (Section 110.4(d))

This table lists the requirements for Controls for Heat Pump Pool Heaters with Supplementary Heating. Installer must ensure all the requirements on this table are met.

### F. Pool Pump Sizing and Flow Rate Specification (Section 150.0(p))

The pool filtration flow rate may not be greater than the rate needed to turn over the pool water volume in 6 hours or 36 gpm, whichever is greater. Calculate Max Flow Rate using the following equation:

$$\text{Max Flow Rate (gpm)} = \frac{\text{Pool Volume (gallons)}}{360\text{min.}}$$

Pool piping must be sized according to the maximum flow rate needed for all auxiliary loads. Show work to calculate return and suction line flow rate, minimum filter area, and the maximum pump flow rate correspond to the pool volume in accordance to section 150.0(p), or refer to Table C below for the prescriptive values. The maximum velocity allowed is 8 fps in the return line and 6 fps in the suction line, and the maximum pump flow rate is less than 6 hour filtration turnover.

3. Select whether the alternative calculation is used.
6. Enter the Pool Volume (gal).
7. Enter Filter Type (Cartridge, Sand, DE).
- 8a Enter the Required Minimum Return Pipe Diameter (inches).
- 8b Enter the Required Minimum Suction Pipe Diameter (inches).
- 8c Enter the Required Minimum Filter Area (ft<sup>2</sup>).
- 8d Enter the Required Maximum Pump Flow (gpm).
9. Enter Return Pipe Diameter (inches).
10. Enter Suction Pipe Diameter (inches).
11. Enter Filter Surface Area (ft<sup>2</sup>).
12. Enter the Maximum Pump Flow Rate (gpm).
13. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.
14. Enter the Measured Flow Rate of the Return Line in fps. This is only used if the alternative calculation is used.
15. Automatically completed Compliance Statement.

#### **G. Pool System Piping** (Section 150.0(p)2)

There must be a length of straight pipe that is greater than or equal to at least 4 inches pipe diameters installed before the pump. Refer to Table D below for the required pipe length. Traditional hard 90° elbows are not allowed. All elbows must be sweep elbows or a type of elbow that has a pressure drop less than the pressure drop of straight pipe with a length of 30 pipe diameters.

#### **H. Pool Filters and Valves** (Section 150.0(p)3 and 4)

Backwash valves must be sized to the diameter of the return pipe or 2 inches, whichever is greater. Multiport backwash valves have a high pressure drop and are discouraged.

**Table C**

**Pool sizing (Values are based on a maximum allowable turnover rate of 6- hours)**

*Note: For pumps greater than 1 hp. The maximum Pump Flow is the lowest speed default filtration*

Max Pool Volume (gallons)	Min Pipe D or Greater (inches)		Min Filter Area or more (square feet)			Max Pump Flow (gpm)
	Return	Suction	Cartridge	Sand	DE	
13,000	1.5	1.5	100	2.4	20	36
17,000	1.5	2	130	3.1	25	47
21,000	2	2	160	3.9	30	58
28,000	2	2.5	210	5.2	40	78
42,000	2.5	3	320	7.8	60	117
48,000	3	3	360	8.9	70	133

**Table D**

**Pipe Diameter/Pipe Length**

Pipe Diameter (inch)	Required Pipe Length leading into pump (inch)
1.5	6
2	8
2.5	10
3	12

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.



# VERIFIED SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

CEC-CF2R-PLB-22-H

## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### CERTIFICATE OF INSTALLATION

Note: This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Date Permit Issued:

#### A. Design Verified Dwelling Unit Water Heating Systems Information (other than HPWH)

This table reports features of the water heating system(s) other than **HPWH** system specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	07	08	09	10	11
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Dwelling Unit DHW System Distribution Type	Compact Distrib.	Drain Water Heat Recovery

#### A2. Design Verified Dwelling Unit HPWH System Information

This table reports the water heating system(s) that were specified on the registered CF1R compliance document for this project.

01	02	03	04	05	06	06a	07	08	09	10
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Tank Volume	Dwelling Unit DHW System Distribution Type	Compact Distribution	Drain Water Heat Recovery	Simulated Equipment Make and Model

#### B. Installed Verified Dwelling Unit Water Heating Systems Information

This table reports features the water heating system other than **HPWH** systems installed in this project

01	02	03	04	05	06	07	08	09	10	11
Dwelling Unit Name	Water Heating System ID or Name	Water Heating System Type	Water Heater Type	# of Like (or Identical) Water Heaters in System	Fuel Type	Rated Input Type	Rated Input Value	Dwelling Unit DHW System Distribution Type	Compact Distrib.	Drain Water Heat Recovery

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### B2. Installed Verified Dwelling Unit HPWH System Information

This table reports the water heating system(s) installed in this project.

01	02	03	04	05	06	06a	07	08	09
Dwelling Unit Name	Water Heating System ID or Name	Modeled Equipment Make and Model	# of Like (or Identical) Water Heaters in System	Tank Location	Exterior Tank Insulation R-value	Tank Volume	Dwelling Unit DHW System Distribution Type	Compact Distribution	Drain Water Heat Recovery

### C. Design Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features specified on the registered CF1R compliance document for this project. (Not needed for central systems)

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank Location

### D. Installed Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heater(s) efficiency features installed in this project. (Not needed for central systems)

01	02	03	04	05	06	07
Water Heating System ID or Name	Heating Efficiency Type	Heating Efficiency Value	Standby Loss (%)	Exterior Insulation R-Value	Water Heater Storage Volume (gal)	Tank Location

### E. Installed Water Heater Manufacturer Information

01	02	03
Water Heating System ID or Name	Manufacturer	Model Number

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### F. Mandatory Measures for Single Dwelling Systems

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Equipment shall meet the applicable requirements of the Appliance Efficiency Regulations (Section 110.3(b)1).
02	Unfired storage tanks are insulated with an external R-3.5 or combination of R-16 internal and external Insulation. (Section 110.3(c)3).
03	<p>Domestic hot water piping insulation requirements (Section 150(J)):</p> <ul style="list-style-type: none"> <li>• All domestic hot water piping shall be insulated as specified in Section 609.12 of the California Plumbing Code. Insulation buried below grade must be installed in a waterproof and non-crushable casing or sleeve.</li> <li>• Pipe insulation shall fit tightly and all elbows and tees shall be fully insulated.</li> <li>• Piping that penetrates framing members shall not be required to have pipe insulation for the distance of the framing penetration.</li> <li>• Piping that penetrates metal framing shall use grommets, plugs, wrapping or other insulating material to assure that no contact is made with the metal framing. Insulation shall butt securely against all framing members.</li> <li>• Piping surrounded with a minimum of 1 inch of wall insulation, 2 inches of crawlspace insulation, or 4 inches of attic insulation shall not be required to have pipe insulation.</li> </ul>
04	<p>For Gas or Propane Water Heaters: Ensure either a or b are installed (Section 150.0(n))</p> <p>a) designated space at least 2.5 feet by 2.5 feet and 7 feet tall within 3 feet from the water heater</p> <ul style="list-style-type: none"> <li>• A dedicated 125V, 20A electrical receptacle connected to the electric panel with a 120/240V 3 conductor, branch circuit rated at 30 amps minimum, within 3 feet from the water heater and is accessible with no obstructions;</li> <li>• The conductor shall be labeled with the word "Spare" on both ends; and</li> <li>• A reserved single pole circuit breaker space next to the circuit breaker next to the branch circuit labeled "Future 240V use" shall be provided.</li> <li>• A condensate drain no more than 2 inches higher than the base of the water heater, and allows natural draining without pump assistance.</li> </ul> <p>b) A designated space at least 2.5 feet by 2.5 feet and 7 feet tall more than 3 feet from the water heater</p> <ul style="list-style-type: none"> <li>• A dedicated 240 volt branch circuit shall be installed within 3 feet from the designated space. The</li> <li>• branch circuit shall be rated at 30 amps minimum. The blank cover shall be identified as "240V ready"; and</li> <li>• The main electrical service panel shall have a reserved space to allow for the installation of a double pole circuit breaker for a future HPWH installation. The reserved space shall be permanently marked as "For Future 240V use"; and</li> <li>• Either a dedicated cold water supply, or the cold water supply shall pass through the designated HPWH location just before reaching the gas or propane water heater; and</li> <li>• The hot water supply pipe coming out of the gas or propane water heater shall be routed first through the designated HPWH location before serving any fixtures; and</li> <li>• The hot and cold water piping at the designated HPWH location shall be exposed and readily accessible for future installation of a HPWH; and</li> <li>• A condensate drain no more than 2 inches higher than the base of the installed water heater, and allows natural draining without pump assistance.</li> </ul>
05	<p>For Air-Source Heat Pump Water Heaters (HPWH), the following shall be met (Section 110.3(c)7)</p> <p>A. Backup heat is required when inlet air is unconditioned, unless the compressor cutout cut-off temperature is below the Heating Winter Median of Extreme. Backup heat may be internal or external to the HPWH</p> <p>B. Meet <b>one</b> of the ventilation requirements below. Minimum volume and opening size requirements shall be the sum of all HPWHs installed within the same space. Compressor capacity shall be determined using AHRI 540 Table 4 reference conditions for refrigeration with the "High" rating test point:</p> <p>a. Installed using a method provided by the manufacturer to meet or exceed the level of performance provided by the ventilation requirements of Section 110.3(c)7B2 through Section 110.3(c)B4.</p> <p>b. For HPWH installation without ducts, the installation space shall have a volume not less than the greater of 100 cubic feet per kBtu per hour of compressor capacity, or the minimum volume provided by the manufacturer for this method; or</p> <p>c. For HPWH installation without ducts, the installation space shall be vented to a communicating space via permanent openings, according to the following requirements:</p> <p>i. Communicating space shall meet the minimum volume of Section 110.3(c)7B12 above, minus the volume of the HPWH installation space; and</p> <p>ii. Permanent openings shall consist of a single layer of fixed flat slat louvers or grilles, with a total minimum Net Free Area (NFA) the larger of 125 square inches plus 25 square inches per kBtu per hour of compressor capacity, or the minimum provided by the manufacturer for this method. The permanent openings shall be fully louvered doors or two openings of equal area, one in the upper half of the enclosure and one in the bottom half of the enclosure. The top of the upper opening must be 12 inches or less from the enclosure top and the bottom of the lower vent must be 12 inches or less from the enclosure bottom; or</p>

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

	d. For HPWH installations with ducts, the following requirements shall be met: <ul style="list-style-type: none"><li>i. The space joined to the installation space via ducts shall meet the minimum volume of Section 110.3(c)7B2 above, minus the volume of the HPWH installation space; and</li><li>ii. All duct connections and building penetrations shall be sealed; and</li><li>iii. Exhaust air ducts and all ducts which cross pressure boundaries shall be insulated to minimum of R-6; and</li><li>iv. Where only the HPWH inlet or outlet is ducted, installation space shall include permanent openings which consist of a single layer of fixed flat slat louvers or grilles in the bottom half of the room, and/or a door undercut. With a ducted inlet, the minimum NFA shall be equal to the cross-sectional area of the duct. With a ducted exhaust, the minimum NFA shall be the larger of 20 square inches or the minimum NFA provided by the manufacturer for this method; and</li><li>v. Where the inlet and outlet ducts both terminate within the same pressure boundary, airflow from the termination points shall be diverted away from each other.</li></ul>
--	--

**G. Verified Compact Hot Water Distribution Expanded Credit (CHWDS-H-EX) (RA3.6.5)**

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor
10	No hot water piping >1 inch diameter is allowed.							
11	Length of 1 inch diameter piping is limited to 8 feet or less.							
12	Two and three story buildings cannot have hot water distribution piping in the attic, unless the water heater is also located in the attic.							
13	Eligible recirculating systems must be Verified Demand Recirculation: Manual Control conforming to RA4.4.17.							

**H. Compact Hot Water Distribution (RA4.4.6)**

For dwelling units with multiple systems, enter the master bath distance and kitchen distance to the closest water heater, and enter the average of the furthest fixture to each water heater.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	02	03	04	05	06	07	08	09
Dwelling Name	Number of Stories	Master Bath distance of furthest fixture to Water Heater in feet	Kitchen distance from furthest fixture to Water Heater in feet	Furthest Third furthest fixture to Water Heater in feet (Avg for multiple water heaters)	Weighted Distance	Qualification Distance	Design Compactness Factor	Calculated Compactness Factor





# VERIFIED SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

CALIFORNIA ENERGY COMMISSION

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## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### I. Verified Drain Water Heat Recovery System (DWHR-H) (RA3.6.9)

DWHR devices shall comply with these requirements.

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

#### Design DWHR System Information

01	02	03	04
System ID/Name	Rated Effectiveness	Installation Configuration	Percent of shower served by the DWHR device

#### Installed DWHR System Information

05	06	07	08	09	10	11
System ID/Name	Manufacturer	Model Number	Rated Effectiveness	Installation Configuration	Percent of shower served by the DWHR device	DWHR System Certified by CEC (Yes/No)
12	For water heating system serving a single dwelling, the DWHR system shall, at the minimum, recover heat from the master bathroom shower and must transfer that heat either back to the respective shower(s) or the water heater.					
13	For central water heating system serving multiple dwellings, the DWHR system shall, at the minimum, recover heat from half the showers located above the first floor and must transfer that heat either back to all the respective showers or the water heater.					
14	The DWHR unit(s) shall be installed within 1 degree of the rated slope. Sloped DWHR shall have a minimum lengthwise slope of 1 degree. The lateral level tolerance shall be within plus or minus 1 degree.					

### J. Verified Pipe Insulation for Single Dwelling Systems (RA3.6.2)

Systems that utilize this distribution type shall comply with these requirements.

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	ECC rater shall perform a visual inspection that all hot water piping complies with the insulation requirements in 150.0(j).
----	--

### K. Verified Central Parallel Piping Requirements (PP-H) (RA3.6.4)

Systems that utilize this distribution type shall comply with these requirements.

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Each central manifold has 5 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For example, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in Table 120.3-A-1.

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# VERIFIED SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

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## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### L. Central Parallel Piping Requirements (RA4.4.4)

Systems that utilize this distribution type shall comply with these requirements.

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	Each central manifold has 15 feet or less of pipe between manifold and water heater.
02	For manifolds that include valves, the manifold must be readily accessible in accordance with the plumbing code.
03	Hot water distribution system piping from the manifold to the fixtures and appliances must take the most direct path. For instance, piping from a second story manifold cannot supply the first floor.
04	The hot water distribution piping must be separated by at least 2 inches from any other hot water supply piping, and at least 6 inches from any cold water supply piping. Alternatively, the hot water supply piping must be insulated to the thicknesses shown in Table 120.3-A-1.

### M. Point of Use Requirements (POU) (RA4.4.5)

Systems that utilize this distribution type shall comply with these requirements.

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	<p>All hot water supply pipe run lengths are equal to or less than the maximum values shown below, based on the pipe diameter. If a combination of piping is used in a single run, then one half the allowed length of each size is the maximum installed length. The maximum allowed length of piping for the longest run terminating in:</p> <p>3/8 inch - For only one pipe size - max length allowed is 15 feet For combination pipe sizes the max allowed length of 3/8-inch piping is 7.5 feet, of 1/2 inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.</p> <p>1/2 inch - For only one pipe size – max length allowed is 10 feet For combination pipe sizes the allowed length of 1/2inch piping is 5 feet, and 3/4 inch piping is 2.5 feet.</p> <p>3/4 inch - For only one pipe size = 5 feet</p>
----	---

### N. Mandatory Requirements for all Recirculation Systems (RA4.4.7)

Systems that utilize a recirculation system shall comply with these requirements.

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	A check valve located between the recirculation pump and the water heater to prevent unintentional recirculation.
02	Piping must take the most direct path between water heater and fixtures.
03	Insulation is not required on the cold water line when it is used as the return.

### O. Recirculation Non-Demand Controls Requirements (RA4.4.8)

Systems that utilize this distribution type shall comply with these requirements.

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	The active control shall be either: timer, temperature, or time and temperature. Timers shall be set to less than 24 hours. The temperature sensor shall be connected to the piping and to the controls for the pump.
----	---

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# VERIFIED SINGLE DWELLING UNIT HOT WATER SYSTEM DISTRIBUTION

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## SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS

### P. Demand Recirculation; Manual Control (RA4.4.9)/Sensor Control (RA4.4.10) Requirements

Systems that utilize either of these distribution types shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	The system operates "on-demand", meaning that the pump begins to operate shortly before or immediately after hot water draw begins, and stops when the return water temperature reaches a certain threshold value. For Demand Recirculation Manual Control, the pump shall be turned on using a manual switch system. For Demand Recirculation Sensor Control, the pump shall be turned on using a sensor system.
02	The controls shall be located in the kitchen, bathroom, and any hot water fixture location that is at least 20 feet from the water heater.
03	Manual controls may be activated by wired or wireless mechanisms. Each control shall have standby power of 1 Watt or less.
04	Sensor controls may be activated by wired or wireless mechanisms, including buttons, motion sensors, door switches and flow switches. Each control shall have standby power of 1 Watt or less.
05	Pump and control placement shall meet one of the following criteria: <ul style="list-style-type: none"><li>• When a dedicated return line has been installed the pump, controls and thermo-sensor are installed at the end of the supply portion of the recirculation loop; or</li><li>• The pump and controls are installed on the dedicated return line near the water heater and the thermo-sensor is installed in an accessible location as close to the end of the supply portion of the recirculation loop as possible; or</li><li>• When the cold water line is used as the return, the pump, demand controls and thermo-sensor shall be installed in an accessible location at the end of supply portion of the hot water distribution line (typically under a sink).</li></ul>
06	After the pump has been activated, the controls shall allow the pump to operate until the water temperature at the thermo-sensor rises to one of the following values: <ul style="list-style-type: none"><li>• Not more than 10°F (5.6°C) above the initial temperature of the water in the pipe; or</li><li>• Not more than 102°F (38.9°C).</li></ul>
07	Controls shall limit operation to no more than 5 minutes following activation.

### Q. Verified Demand Recirculation Manual Control (RDRmc-H) (RA3.6.6)/Sensor Control (RDRsc-H) (RA3.6.7) Requirements

Systems that utilize this distribution type shall comply with these requirements.

***The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.***

01	ECC - rater shall perform a visual inspection to verify that the demand pump, manual/sensor controls and thermo-sensor are present and operating properly consistent with the applicable requirements of RA4.4.9 and RA4.4.10
----	---

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 installation is true and correct.
2. I am either: a) a responsible person eligible under division 3 of the business and professions code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this certificate of installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this certificate of installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the certificate of compliance, plans, and specifications approved by the enforcement agency.
4. I understand that an ECC-Rater will check the installation to verify compliance and if such checking determines the installation fails to comply, I am required to offer any necessary corrective action at no charge to the building owner.
5. I understand that a registered copy of this certificate of installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
6. I understand that a registered copy of this certificate of installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-PLB-22-H User Instructions

### A. Design Verified Dwelling Unit Water Heating Systems Information

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

### A2. Design Verified Dwelling Unit HPWH System Information

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

### B. Installed Verified Dwelling Unit Water Heating Systems Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name - Reference information from Table A.
2. Water Heating System ID or Name – Reference information from Table A.
3. Water Heating System Type – Reference information from Table A. The different kinds of water heating system type are DHW, or Combined Hydronic.
4. Water Heater Type – Reference information from Table A. The different kinds of water heaters are Large/Commercial Storage, Small/Consumer Storage, Residential-Duty Commercial Storage, Heat Pump, Boiler, Large/Commercial Instantaneous, Small/Consumer Instantaneous, Residential-Duty Commercial Instantaneous or Indirect.
5. # of Like (or Identical) Water Heaters in system – Reference information from Table A.
6. Fuel Type – Reference information from Table A. The different kinds of fuel types are heat pump, electric resistance, natural gas, and propane.
7. Rated Input Type – Reference information from Table A. For natural gas and propane, the input type is Btu/hr. For heat pump and electric resistance, the input type is kW.
8. Rated Input Value – User input. Numerical value of the rated input. Must be equal to or less than value indicated on the CF1R.
10. Dwelling Unit DHW System Distribution Type - Reference information from Table A.
11. Compact Distribution - Reference information from Table A.
12. Drain Water Heat Recovery - Reference information from Table A.

### B2. Installed Verified Dwelling Unit HPWH System Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Dwelling Unit Name - Reference information from Table A2.
2. Water Heating System ID or Name – Reference information from Table A2.
3. Modeled Equipment Make and Model number – User input must be equal to the value indicated on Table A2 as default and allow user to override.
4. # of Like (or Identical) Water Heaters in system –Reference information from Table A2.
5. Tank Location – User input must equal reference information on Table A2.
6. Exterior Tank Insulation – User Input must be equal to or greater than reference information from Table A2.
- 6a. Tank Volume – User input must equal reference information on Table A2.
7. Dwelling Unit DHW System Distribution Type –Reference information from Table A2.

8. Compact Distribution - Reference information from Table A2.
9. Drain Water Heat Recovery - Reference information from Table A2.

### C. Design Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

### D. Installed Verified Dwelling Unit Water Heating Efficiency Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater.

1. Water Heating System ID or Name – Reference information from Table A.
2. Heating Efficiency Type – Reference information from Table C. Different efficiency types are Energy Factor, AFUE, UEF and Thermal Efficiency.
3. Heating Efficiency Value – User input must be equal to or higher efficiency than value indicated on the CF1R.
4. Standby Loss – User input. Must be equal to or less than value indicated in Table C. Value may be N/A if CF1R value is N/A.
5. Exterior Insulation R-Value – User input. Must be equal to or higher than value indicated in Table C. Value may be N/A if CF1R value is N/A.
6. Water Heater Storage Volume (gal) – User input. Value may be N/A if water heater type is instantaneous with zero storage.
7. Tank location – User input. Must be equal to system type indicated in Table C.

### E. Installed Water Heater Manufacturer Information

This table reports the manufacturer information of the installed water heater(s). Require one line for each installed water heater

1. Water Heating System ID or Name – Reference information from CF1R.
2. Manufacturer – User input. Enter the name of the water heater manufacturer.
3. Model Number – User input. Enter the model number of the water heater.

### F. Mandatory Measures for Single Dwelling Systems

This table lists the requirements for Single Dwelling systems. ECC rater must ensure all the requirements in this table are met.

### G. Verified Compact Hot Water Distribution Expanded Credit and H. Compact Hot Water Distribution Basic

If performance compliance is used, this table lists the values used in the performance calculation and require no user input.

If prescriptive compliance is used, fill out this table.

1. Reference information from CF1R
2. Enter the master bath distance of furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.
3. Enter the kitchen distance from furthest fixture to water heater in feet. For multiple water heaters, enter the distance to the closest water heater.
4. Enter furthest third fixtures from fixture to Water Heater in feet. For multiple water heaters, enter the average of the furthest distance of each water heater.

5. Weighted Distance - Calculated value – no user input required.
6. Qualification Distance - Calculated value – no user input required.

### I. Verified Drain Water Heat Recovery System

This table lists the requirements for all drain water heat recovery systems. ECC rater must ensure all the requirements in this table are met.

1. Reference information from CF1R.
2. Reference information from CF1R.
3. Reference information from CF1R.
4. Reference information from CF1R.
5. Reference information from CF1R.
6. Drain Water Heat Recovery Manufacturer's Name- Enter the name of the manufacturer.
7. Drain Water Heat Recovery Manufacturer's Model Number – Enter the model number.
8. Rated Effectiveness – Enter the rated effectiveness of the DWHR device.
9. Installation Configuration – Enter type of configuration. Available options are: Equal flow, unequal to shower, and unequal to water heater
10. Percent of showers served by the DWHR device – Enter the percent of showers served by this DWHR device.
11. DWHR System Certified by CEC – Enter “Yes” if certified or else enter “No”.

### J. Verified Pipe Insulation for Single Dwelling Systems

This table only applies to systems indicated as Verified Pipe Insulation . In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

### K. Verified Central Parallel Piping Requirements

This table only applies to systems indicated as Verified Central Parallel Piping. In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

### L. Central Parallel Piping Requirements

This table only applies to systems indicated as Central Parallel Piping. In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

### M. Point of Use Requirements

This table only applies to systems indicated as Point of Use In addition to the mandatory requirements in Table F, the installer must ensure the requirements in this table are met.

### N. Mandatory Requirements for all Recirculation Systems

The requirements of this table apply to all recirculation systems listed below.

### O. Recirculation Non-Demand Controls Requirements

This table only applies to systems indicated as Recirculation Non-demand Controls. In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.

### P. Demand Recirculation Manual Control/Sensor Control Requirements

This table only applies to systems indicated as Demand Recirculation Manual Control, Demand Recirculation Sensor Control, Verified Demand Recirculation Manual Control or Verified Demand Recirculation Sensor Control.

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-PLB-22-H
Verified Single Dwelling Unit Hot Water System Distribution	(Page 4 of 4)

In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.

#### **Q. Verified Demand Recirculation Manual Control/Sensor Control Requirements**

This table only applies to systems indicated as Verified Demand Recirculation Manual Control or Verified Demand Recirculation Sensor Control. In addition to the mandatory requirements in Table F and N, the installer must ensure the requirements in this table are met.

#### **Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION ONLY. NOT VALID UNTIL REGISTERED WITH AN ECC PROVIDER.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**Note:** This Certificate of Installation document is only applicable if a PV system is in the proposed design or PV Exceptions are selected in the CF1R-PRF-01 or CF1R-NCB-01.

**A. General Information**

01	Project Location (City)		02	Building Type	
03	Climate Zone		04	Method of Compliance:	
05	Qualifying Exceptions		06	Community Solar	

**B. Design Photovoltaic Systems Information**

01	02	03	04	05	06	07	08	09	10	11	12	13
PV Array ID or Name	Adjusted Minimum PV Size (kW)	Adjusted Minimum PV Size from qualified exception requirement	Module Type	CFI (Yes/No)	Azimuth (deg)	Tilt Input (Deg/Pitch)	Angle/Tilt	Annual Solar Access (%)	Inverter Efficiency (%)	Shading Requirement Compliance Path	Array Type	Module Level Power Electronics
14	Total DC System Size (kW)											

**C. Installed Photovoltaic Systems Information**

**If the installer certifies that the installed PV system matches or exceeds the design PV system, the building complies with the PV system requirement, otherwise it does not comply.**

01	02	03	04	05	06	07	08	09	10
PV Array ID or Name	DC System Size (kW)	Module Type	Azimuth (deg)	Tilt Input (Deg/Pitch)	Angle/Tilt	Annual Solar Access (%)	Inverter Efficiency (%)	Array Type	Module Level Power Electronics
11	Total DC System Size (kW)								

**D. Solar Access Verification**

**The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	The installer shall provide documentation that demonstrates the shading condition of the actual installation of the PV module is consistent with the annual solar access % in Table B. The verification must be done by measurements from an approved solar assessment tool or other CEC approved alternative methods. The satellite, drone or other digital image of the obstructions that cast shadows on the PV array must be created and dated after the installation of the photovoltaic system. If the image is dated before the installation, then additional on-site pictures must be attached to clearly show that the installed system matches the system modeled in the solar assessment report.
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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****E. System Monitoring Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

All installed PV system must have a working web based portal and a mobile device application provide access to the following information

01	Nominal kW rating of the PV system
02	Number of PV modules and nominal watt rating of each module
03	Hourly (or 15 min), daily, monthly and annual kWh production in numeric and graphic format
04	Running total of daily kWh production
05	Daily kW peak power production
06	Current kW production of the entire PV system

**F. Qualifying Exception Requirement**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

<b>Limited Solar Access</b>
The installer shall provide documentation of the solar access roof area (SARA) limitations that justify the exception. Documentation may include roof plans, aerial photos, satellite images, 3D model, or other documentation that clearly shows the available solar access roof areas that meet the definition of SARA in 150.1(c)14
<b>Declared emergency area</b>
If a building is damaged or destroyed in a declared emergency area prior to 1/1/2020 (AB-178), it must comply with PV requirement applicable on originally constructed permit date. Eligibility to this exception, such as income or insurance requirements, shall be confirmed by the enforcement agency.
<b>Snow Load</b>
The installer shall provide roof design, PV system design, and/or ASCE Standard 7-22, Chapter 7, Snow Loads calculation to the enforcement authority. The enforcement authority must determine that it is not possible for the PV system, including panels, modules, components, supports, and attachments to the roof, to meet ASCE Standard 7-22, Chapter 7, Snow Loads.
<b>10-109(k) PV Requirement Determination</b>
Only buildings within the jurisdiction of Trinity Public Utility District qualify for this exception.

**G. SMUD Solar Share Program**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Required kW	
02	Standard Design kW (CFI1 orientation and 98% solar access)	
03	Attach a copy of SMUD Attestation of Premise Registration in Neighborhood SolarShares (Attestation).	

**H. Compliance Statement**

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

## CF2R-PVB-01-E User Instructions

### A. General Information

1. For information only and requires no user input.
2. For information only and requires no user input.
3. User choose from list of qualifying exceptions to the PV requirements. If no exception applicable, choose N/A
4. For information only and requires no user input.
5. For information only and requires no user input.
6. For information only and requires no user input.

### B. Design Photovoltaic Systems Information

This table reports the PV system features that were specified on the registered CF1R compliance document for this project. For information only and requires no user input.

### C. Installed Photovoltaic Systems Information

1. PV Array ID or Name - Reference information from CF1R.
2. DC System Size – Enter the kWdc of the array. Must be equal or greater the adjusted design system size for this array.
3. Module Type – If the array meets the California Flexible Installation criteria, then enter the Module Type. Different module types are Standard and Premium.
4. Azimuth - If the array meets the California Flexible Installation criteria, then enter the azimuth of the array in degrees from North.
5. Tilt Input - Different Tilt input are Degree and Pitch.
6. Angle/Tilt - Enter the value of the angle or tilt.
7. Annual Solar access – Enter the percent of solar access
8. Inverter Efficiency – Enter the inverter efficiency in percent. Must be equal or greater the design inverter efficiency for this array.
9. Array Type – Choose from: fixed (open rack), tracking (one axis), tracking (two axis)
10. Module Level Power Electronics – Choose from: microinverters or DC power optimizers

### D. Solar Access Verification

Installer must ensure all the requirements on this table are met.

### E. System Monitoring Requirements

Installer must ensure all the requirements on this table are met.

### F. Qualifying Exception Verification

Installer must ensure all the requirements on this table are met.

### G. SMUD Solar Share Program

Installer must ensure all the requirements on this table are met.

**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

01	Project Location (City)		02	Building Type	
03	Climate Zone		04	Method of Compliance:	

**B. Design Battery Energy Storage System (BESS) Information**

01	02	03	04	05
Battery Compliance Cycling Capacity (kWh)	Control	Charging Efficiency (%)	Discharging Efficiency (%)	Round Trip Efficiency (%)

**C. Installed Battery Energy Storage System (BESS) Information**

*The responsible builder/installer certifies that the battery energy storage system installer has installed the 2025 JA12 compliant battery energy storage system. The list of JA12 compliant battery energy storage systems are available at:*

<https://solarequipment.energy.ca.gov/Home/EnergyStorage> for Integrated BESS

<https://solarequipment.energy.ca.gov/Home/BatteryList> for Field-Assembled BESS

01	02	03	04	05	06	06b
Manufacturer	Model #	Battery Compliance Cycling Capacity (kWh)	Control During Commissioning	Charging Efficiency (%)	Discharging Efficiency (%)	Round Trip Efficiency (%)
07	Battery Energy Storage System (BESS) Certified by CEC for JA12-2025. <input type="checkbox"/> Yes <input type="checkbox"/> No					

**D. Compliance Statement**

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**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

CERTIFICATE OF INSTALLATION – USER INSTRUCTIONS	CF2R-PVB-02-E
Battery Energy Storage System (BESS)	(Page 3 of 1)

## CF2R-PVB-02-E User Instructions

### A. General Information

This table reports the general information that were specified on the registered CF1R compliance document for this project. For information only and requires no user input.

### B. Design Battery Energy Storage System (BESS) Information

This table reports the BESS features that were specified on the registered CF1R compliance document for this project. For information only and requires no user input.

### C. Installed Battery Energy Storage System (BESS) Information

1. Manufacturer – Enter the name of the manufacturer
2. Model # - Enter the model number of the BESS
3. Battery Capacity – Enter the rated battery capacity in kWh
4. Control – Enter the control strategy of the BESS. The options are basic, TOU, and Advanced DR
5. Charging Efficiency – Enter the rated charging efficiency in %
6. Discharging Efficiency – Enter the rated discharging efficiency in %
- 6a Round Trip Efficiency (%) - Enter the rated trip efficiency (%)
7. BESS Certified and listed be CEC – Check whether the BESS is certified and listed in the CEC website.

### Documentation Declaration Statements

1. The person who prepared the CF2R 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.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. General Information**

Only use this form if the newly constructed do not have a PV system installed.

01	Method of Compliance:	
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**B. Building Meets the Solar Readiness Requirements**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Compliance with Solar Readiness Requirements	
02	The construction documents indicate: <ul style="list-style-type: none"><li>• The solar zone</li><li>• A location for inverters and metering equipment</li><li>• A pathway for routing of conduit from the solar zone to the point of interconnection with the electrical service</li><li>• A Pathway for routing of plumbing from the solar zone to the water heating system</li><li>• The structural design loads for roof dead load and roof live load, in the solar zone</li></ul>	
03	A copy of the construction documents including all the information above will be provided to the occupant.	
04	<ul style="list-style-type: none"><li>• The main electric service panel shall have a minimum busbar rating of 200 amps.</li><li>• The main electric service panel shall have reserved space to allow for the installation of a double pole circuit breaker. The reserved space shall be positioned at the opposite (load) end from the input feeder location or main circuit location. The reserved space shall be permanently marked as "For Future Solar Electric".</li></ul>	

**C. Residence Not in an Applicable Subdivision**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	The single family residence is located in a newly constructed subdivision with fewer than ten single family residences.	
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**D. Permanently Installed Solar Water Heating System**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	Solar Water Heating System Rating	
02	Solar Savings Fraction of the Proposed Solar Water Heating System	
03	Compliance Statement:	

**E. Smart Thermostats and Alternative Efficiency Measure**

*The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.*

01	All thermostats comply with Reference Joint Appendix JA5 and are capable of receiving and responding to Demand Response Signals prior to granting of an occupancy permit by the enforcing agency.	
02	Alternative Efficiency Measure:	

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:
Third Party Quality Control Program (TPQCP) Status:	Name of TPQCP (if applicable):	

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

CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-SRA-01-E
Sample Form – Not Valid For Submission To Building Departments	(Page 1 of 1)

## CF2R-SRA-01-E User Instructions

### A. General Information

1. Method of Compliance: User selects Method of Compliance from the available options.

### B. Building Meets the Solar Readiness Requirements – Optional table based on user selection in cell A02:

1. Compliance with Solar Readiness Requirement: Auto filled text based on the existence of a registered CF2R-SRA-02.

### C. Residence is not in Applicable Subdivision – Optional table based on user selection in cell A01.

### D. Permanently Installed Solar Water Heating System – Optional table based on user selection in cell A01:

1. Solar Water Heating System Rating: User selects Solar Water Heating System Rating from the available options.
2. Required Minimum Solar Savings Fraction of the Proposed Solar Water Heating System: Auto filled minimum solar savings fraction required.
3. Solar Savings Fraction of the Proposed Solar Water Heating System: Auto filled proposed solar savings fraction from a registered CF1R-STH-01 or CF1R-STH-02.
4. Compliance Statement: Auto filled compliance statement text, based on the answers to questions E01 through E03.

### E. Smart Thermostats and Alternative Efficiency Measure – Optional table based on user selection in cell A01.

1. Alternative Efficiency Measure: User selects the alternative efficiency option installed.

### Documentation Declaration Statements

1. The person who prepared the CF2R 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.



**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

**CERTIFICATE OF INSTALLATION**

**Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

Solar Zone Area (requirements in §110.10 (b)1A Exception 1 or 6.

This worksheet applies to:

- Single family residences without PV that wish to show compliance with the Solar Readiness requirements (Section 110.10(b) by providing a solar zone on the roof of the residence. Note that Exceptions 1 and 6 to Section 110.10(b)1A exempt a residence from the solar Readiness requirements and are documented on the Certificate of Installation document CF2R-SRA-01-E. Check the exception being used and fill in the relevant details.

**A. Minimum Required Solar Zone Area for Single Family Residence**

01	Does the residence have three stories or more, and a total floor area less than or equal to 2,000 ft <sup>2</sup> ?	
02	Is the residence located in Climate zones 8-14, in a Wildland-Urban Interface Fire Area as defined in Title 24, Part 2, and have a whole house fan?	
03	What is the total area of low-sloped roofs where the annual solar access is 70% or greater (ft <sup>2</sup> )?	
04	What is the total area of steep-sloped roofs oriented between 90 and 300 degrees relative to true north, where the annual solar access is 70% or greater (ft <sup>2</sup> )?	
05	Solar Zone Area – Solar Access Method (ft <sup>2</sup> )	
06	Are all the thermostats Occupant Controlled Smart Thermostats (OCSTs), certified to the Energy Commission and listed on the Commission's appliances database? Alternatively, a networked system of devices may be installed that provides functionality equivalent to an OCST.	
07	Minimum Required Solar Zone Area (ft <sup>2</sup> ):	

**B. Schedule of Solar Zone Sub-Areas**

**Notes:**

- “A roof is either low-sloped or steep-sloped. Low-sloped” means a rise-to-run of 2:12 or less (9.5 degrees from horizontal). “Steep-sloped” means a rise-to-run greater than 2:12 (9.5 degrees from horizontal)
- The solar zone shall comply with access, pathway, smoke ventilation, and spacing requirements as specified in Title 24, Part 9 or other Parts of Title 24 or in any requirements adopted by a local jurisdiction.
- No obstructions, including but not limited to, vents, chimneys, architectural features, and roof mounted equipment, shall be located in the solar zone.
- If there are any obstructions located south of the most northerly point of the solar zone, then the nearest point of the solar zone must be located no closer than twice the distance, measured in the

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS**

horizontal plane, of the height difference between the highest point of the obstruction and the nearest point of the solar zone, measured in the vertical plane.

01	02	03	04	05	06	07	08	09	10	11
Subarea ID	Building Plan Reference	Slope of Roof or Overhang (Note A)	Is Steep Slope, roof or overhang is oriented between 90 and 300 degrees relative to true north?	Subarea Complies with Part 9 of Title 24 (Note B)	Plane Containing the Solar Zone is Free of Obstructions (Note C)	Subarea is Located the Appropriate Distance from Obstructions (Note D)	Smallest Dimension is 5 feet or Greater	Subarea is at least 80 ft <sup>2</sup> (160 ft <sup>2</sup> for a Building with Roof Area >10,000ft <sup>2</sup> )	Subarea Qualifies	Area (ft <sup>2</sup> )
12	Total Proposed Solar Zone Area (ft <sup>2</sup> )									
13	Compliance Statement:									

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

### CF2R-SRA-02-E User Instructions

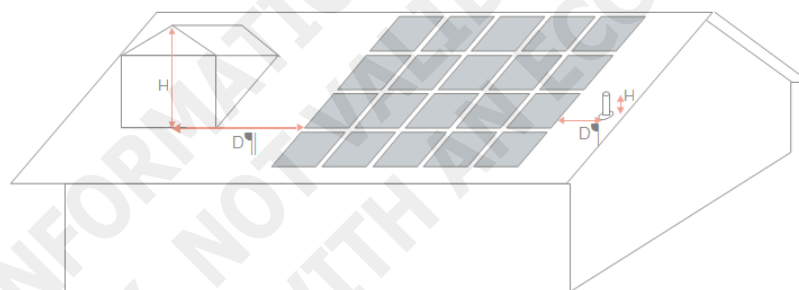
**A. Minimum Required Solar Zone Area for Single Family Residence** (Complete this section only if ‘Single Family’ is selected in A01)

1. User chooses whether the building has three or more stories and a total floor area less than or equal to 2,000 ft<sup>2</sup>.
2. User chooses whether the residence is located in climate zones 8-14, is in a Wildland-Urban Interface Fire Area as defined in Title 24, Part 2 and has a whole house fan.
3. User enters the total area in units of ft<sup>2</sup> of low-sloped roof where the annual solar access is 70% or greater. Note that a Low Sloped Roof is defined as having a rise to run less than or equal to 2:12 or 9.5 degrees from horizontal. If this value is not known, then the user would enter ‘N/A’. To determine the annual solar access during the design phase, designers will first evaluate whether there are any objects external to the building project that will shade the rooftop (or other prospective solar zone areas such as overhangs or parking shade structures). If an existing object is located to the north of all potential solar zones, the object will not shade the solar zone. Similarly, if the horizontal distance (“D”) from the object to the solar zone is at least two times the height difference (“H”) between the highest point of the object and the horizontal projection of the nearest point of the solar zone then the object will not shade the solar zone (see Figure 9.2). If objects external to the building project could shade the solar zone, annual solar access can be quantitatively determined using several computer-aided design (CAD) software packages which can import a CAD file of the building and perform a shading analysis or several online solar quoting tools which make use of both overhead and orthogonal aerial imagery. Annual solar access can be qualitatively determined using several three-dimensional modeling programs.
4. User enters the total area in units of ft<sup>2</sup> of steep-sloped roof oriented between 90 and 300 degrees relative to true north, where the annual solar access is 70% or greater. Note that a Steep Sloped Roof is defined as having a rise to run of greater than 2:12 or 9.5 degrees from horizontal. If this value is not known, then the user would enter ‘N/A’. To determine the annual solar access during the design phase, designers will first evaluate whether there are any objects external to the building project that will shade the rooftop (or other prospective solar zone areas such as overhangs or parking shade structures). If an existing object is located to the north of all potential solar zones, the object will not shade the solar zone. Similarly, if the horizontal distance (“D”) from the object to the solar zone is at least two times the height difference (“H”) between the highest point of the object and the horizontal projection of the nearest point of the solar zone then the object will not shade the solar zone (see Figure 9.2). If objects external to the building project could shade the solar zone, annual solar access can be quantitatively determined using several computer-aided design (CAD) software packages which can import a CAD file of the building and perform a shading analysis or several online solar quoting tools which make use of both overhead and orthogonal aerial imagery. Annual solar access can be qualitatively determined using several three-dimensional modeling programs.
5. The Designated Solar Zone Area is auto calculated using the equation  $(B03+B04)*0.5$ . Note if either B03 or B04 equals N/A, then this field will be marked N/A.
6. User chooses whether or not all thermostats are Occupant Controlled Smart Thermostats (OCSTs) which have been certified to the Energy Commission.
7. The Minimum Required Solar Zone Area is auto calculated and based on the numbers and answers previously entered in this table.

## B. Schedule of Solar Zone Sub-Areas

1. User enters Solar Zone Area identification information which matches the callouts shown on the building plans e.g., solar-1.
2. User enters the building plan reference number which includes a drawing of the solar zone subarea.
3. User selects whether the solar zone subarea is located on a low-sloped or steep-sloped section of the roof.
4. If user selects steep slope in B03, then the user must select whether the roof or overhang is oriented between 110 and 270 degrees relative to true north. If user selects low slope in D03, then this question will be answered with N/A.
5. User selects whether the subarea complies with all requirements of Title 24, Part 9.
6. User selects whether the plane(s) containing the solar zone are free of obstructions such as vents or chimneys.
7. User selects whether the solar zone subarea is located an appropriate distance from any on-roof obstructions. If user selects yes in D06, then this question will be answered with N/A. For single family residences buildings, any obstruction, located on the roof or any other part of the building that projects above the solar zone shall be located at a sufficient horizontal distance away from the solar zone, in order to reduce the resulting shading of the solar zone. For each obstruction, the horizontal distance (“D”) from the obstruction to the solar zone shall be at least two times the height difference (“H”) between the highest point of the obstruction and the horizontal projection of the nearest point of the solar zone ( $D \geq 2 \times H$ ).

**Figure 7.1 Artistic Depiction of “H” and “D”**



Source: California Energy Commission

8. User selects whether the smallest dimension of the solar zone subarea is five feet or greater.
9. User selects whether the solar zone subarea covers at least 80 ft<sup>2</sup> of roof space for a roof with a roof area of 10,000 ft<sup>2</sup> or less. If the roof area is greater than 10,000 ft<sup>2</sup>, the solar zone subarea must be no smaller than 160 ft<sup>2</sup>.
10. The Sub-area qualification is auto calculated and is based on the information entered in this table.
11. User enters the square footage of the solar zone subarea.
12. The Total Solar Zone Area (ft<sup>2</sup>) is calculated by summing the areas of all qualifying solar zone subareas.
13. The building complies if the solar zone area (ft<sup>2</sup>) is greater than the minimum required solar zone area (ft<sup>2</sup>) found in A07.



**Documentation Declaration Statements**

1. The person who prepared the CF2R 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.

FOR INFORMATION AND DATA COLLECTION  
ONLY. NOT VALID UNTIL REGISTERED  
WITH AN ECC PROVIDER.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****CERTIFICATE OF INSTALLATION****Note:** This table completed by ECC Registry.

Project Name:	Enforcement Agency:
Dwelling Address:	Permit Number:
City and Zip Code:	Permit Application Date:

**A. Design Solar Water Heating Systems Information**

01	02	03	04	05	06	07	08	09	10
System Name	Collector Manufacturer	Collector Brand	Collector Model	# of Collectors	Azimuth from North	Tilt from Horizontal	Tank Volume (gal)	SRCC/IAPMO Number	Solar Savings Fraction

**B. Installed Solar Water Heating Systems Information**

01	02	03	04	05	06	07	08	09	10
System Name	Collector Manufacturer	Collector Brand	Collector Model	# of Collectors	Azimuth from North	Tilt from Horizontal	Tank Volume (gal)	SRCC/IAPMO Number	Solar Savings Fraction

**C. Mandatory Measures for Solar Water Heating Systems****The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.**

01	Backup storage tanks for solar water-heating systems have R-3.5 external insulation, or R-16 internal insulation where the internal insulation R-value indicated on the exterior of the tank. (§150.0(j)1).
02	All domestic hot water piping (including solar) shall be insulated (§150.0(j)2A).
03	The collectors are located in a position that is not shaded by adjacent buildings or trees.
04	<b>OG-300 System only</b> - The collectors shall face within 35° of south and be tilted at a slope of at least 3:12.

**SAMPLE FORM – NOT VALID FOR SUBMISSION TO BUILDING DEPARTMENTS****DOCUMENTATION AUTHOR'S DECLARATION STATEMENT**

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

Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/AEA/ECC 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 Installation is true and correct.
2. I am either: a) a responsible person eligible under Division 3 of the Business and Professions Code in the applicable classification to accept responsibility for the system design, construction, or installation of features, materials, components, or manufactured devices for the scope of work identified on this Certificate of Installation, and attest to the declarations in this statement, or b) I am an authorized representative of the responsible person and attest to the declarations in this statement on the responsible person's behalf.
3. The constructed or installed features, materials, components or manufactured devices (the installation) identified on this Certificate of Installation conforms to all applicable codes and regulations and the installation conforms to the requirements given on the Certificate of Compliance, plans, and specifications approved by the enforcement agency.
4. I understand that a registered copy of this Certificate of Installation shall be posted or made available with the building permit(s) issued for the building and shall be made available to the enforcement agency for all applicable inspections. I will take the necessary steps to fulfill this requirement.
5. I understand that a registered copy of this Certificate of Installation is required to be included with the documentation the builder provides to the building owner at occupancy. I will take the necessary steps to fulfill this requirement.

Responsible Builder/Installer Name:	Responsible Builder/Installer Signature:	
Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)	Position With Company (Title):	
Address:	CSLB License:	
City/State/Zip:	Phone:	Date Signed:

CERTIFICATE OF INSTALLATION - USER INSTRUCTIONS	CF2R-STH-01-E
Solar Water Heating Systems	(Page 1 of 1)

## CF2R-STH-01-H User Instructions

### Section A. Design Solar Water Heating Systems Information

This table reports the water heating system features that were specified on the registered CF1R compliance document for this project. This section is for information/verification purposes only and requires no user input.

### Section B. Installed Solar Water Heating Systems Information

This table reports the water heating system information that is being installed. Require one line for each installed water heater. For OG-100 systems, the installed system must match the designed in Table A.

1. System Name - Reference information from Table A.
2. Collector Manufacturer – User input for OG-300 systems.
3. Collector Brand – User input for OG-300 systems.
4. Collector Model – User input for OG-300 systems.
5. # of Collectors – User input for OG-300 systems.
6. Azimuth from North - User input for OG-300 systems. Must be between 145 to 215 degrees from North
7. Tilt from Horizontal - User input for OG-300 systems. Must be between 14 to 90 degrees from horizontal
8. SRCC/IAPMO Number - User input for OG-300 systems.
9. Solar Savings Fraction - User input for OG-300 systems. Must be equal or better than the solar savings fraction in Table A

### Section C. Mandatory Measures for Solar Water Heating Systems

1. Verify that all storage tanks that are part of the solar system are insulated with either R-3.5 external insulation or labeled that they have at least R-19 internal insulation.
2. Verify that all piping in the solar system meets minimal insulation levels per §150.0(j)2A.
3. The collectors shall be located in a position that is not shaded by adjacent buildings or trees between 9:00 AM and 3:00 PM. Inspect site to determine if any structural component of the building, adjacent structures, or tree may shade the collector area.
4. OG-300 System only - Collector System orientation shall be within 35° from true south Declination from true north for the site should be calculated and included in this measurement.

### Documentation Declaration Statements

1. The person who prepared the CF2R 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.