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

**CERTIFICATE OF COMPLIANCE**

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

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

## A. General Information

| | | | | | |
|---|---|---|---|---|---|
| 01 | Project Name: | | 02 | Date Prepared: | |
| 03 | Project Location: | | 04 | Building Front Orientation (deg or cardinal): | |
| 05 | CA City: | | 06 | Number of Dwelling Units: | |
| 07 | Zip Code: | | 08 | Fuel Type: | |
| 09 | Climate Zone: | | 10 | Total Conditioned Floor Area ($ft^2$): | |
| 11 | Building Type: | | 12 | Slab Area ($ft^2$): | |
| 13 | Project Scope: | | 14 | Fenestration Exceptions: | |

## B. Building Insulation Details – Framed (Section 150.1(c)1)

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **Proposed** | | | | | **Required** | |
| | | | | | | | | Joint Appendix JA4 Reference | | | |
| Tag/ID | Assembly Type | Frame Type | Frame Depth (inches) | Frame Spacing (inches) | Cavity R-value | Continuous Insulation R-value | U-Factor | Table | Cell | U-Factor from Table 150.1-A | Comments |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

## C. Building Insulation Details – Nonframed (Section 150.1(c)1)

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| | | | **Proposed** | | | | | **Required** | |
| | | | | | | Joint Appendix JA4 Reference | | | |
| Tag/ID | Assembly Materials | Thickness (inches) | Core Insulation R-value | Continuous Insulation R-value | U-Factor | Table | Cell | U-Factor from Table 150.1-A | Comments |
| | | | | | | | | | |
| | | | | | | | | | |

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

**D. Building Insulation Details – Mass Walls** (150.1(c)1Bii)

**Note**: When insulation is added to the outside of a mass wall and/or when the inside is furred and insulated, the performance data may be adjusted using Equation 4-4 in the Reference Appendices, Joint Appendix, JA4.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **Proposed** | | | | | | | | | | **Required** | | | |
| | Above or Below Grade? | Mass Type | Mass Thickness (inches) | Mass Wall Joint Appendix JA4 Reference | | Exterior Insulation | | Interior Insulation | | Insulation Layer Joint Appendix JA4 Reference | | Exterior Insulation | | Interior Insulation | |
| Tag/ID | | | | Table | Cell | R-value | U-factor | R-value | U-factor | Table | Cell | R-value | U-factor | R-value | U-factor |
| | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | |

**E. Slab On Grade/Concrete Raised Floor Insulation** (Table 150.1-A)

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

| 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|
| | **Proposed** | | **Required** | | |
| Floor Type | Insulation R-value | Insulation U-factor | Insulation R-value | Insulation U-factor | Comments |
| | | | | | |
| | | | | | |

**F. Ceiling/Roof Insulation** (Section 150.1(c)1A)

Note:

- Cathedral ceilings cannot comply with prescriptive requirements. Performance compliance is required.
- Option B requires below deck insulation in climate zones 4 and 8-16. An air space is required if below deck insulation is required.
- Option C requires heating and cooling ducts be located inside the conditioned space.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| | | **Proposed** | | **Required** | | | |
| Option (B or C) | Air Space Required? | Below Roof Deck R-value | Ceiling Insulation R-value | Below Roof Deck R-value | Ceiling Insulation R-value | Radiant Barrier Required? | Comments |
| | | | | | | | |
| | | | | | | | |

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

**G. Roofing Products (Cool Roof)** (Section 150.1(c)11)

**Notes:**

- Exception : Any roof area covered by building integrated photovoltaic (PV) panels or solar thermal panels is exempt from the above Cool Roof requirements.
- Exception 2: Roof constructions with a weight of 25 pounds per square foot (lb/ft$^2$) or greater are also exempt.
- Liquid field applied coatings must comply with installation criteria from Section 110.8(i)4.

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

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

**H. Opaque Swinging Doors to Exterior** (Section 150.1(c)5)

Notes:

- Any door with 25 percent or more glass is counted as a fenestration product in Tables I and J.
- Do not include fire-rated doors between garage or unconditioned space and conditioned space.
- If using weighted average to achieve required maximum U-factor, attach CF1R-ENV-02-E.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| Tag/ID | Area | Proposed U-factor | Proposed U-factor Source | Required Maximum U-factor | Weighted Average (Yes/No) | Comments |
| | | | | | | |
| | | | | | | |

**I. Fenestration/Glazing Allowed Areas and Efficiencies** (Section 150.1(c)3)

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

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

**J. Fenestration Proposed Areas and Efficiencies** (Section 150.1(c)3)

Note:

- If meeting Exception 1 to 150.1(c)3A, Installing less than or equal to 3 square feet ($ft^2$) glass in door, it is assumed to meet the minimum required U-factor (0.30) & SHGC (0.23).
- If meeting Exception 1 to 150.1(c)3A, Installing less than or equal to 3 square feet ($ft^2$) tubular skylight, it is assumed to meet the minimum required U-factor (0.55) & SHGC (0.30).
- Doors with greater than or equal to 25 percent glazing area are treated as a fenestration product.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tag/ID | Fenestration Type | Frame Type | Dynamic Glazing | Orientation N, S, W, E | Number of Panes | Proposed Fenestration Area ($ft^2$) | Proposed West Facing Fenestration Area ($ft^2$) | Proposed U-factor | Proposed U-factor Source | Proposed SHGC | Proposed SHCG Source | Exterior Shading Device | Combined SHGC from CF1R-ENV-03 |
| | | | | | | | | | | | | | |
| 15 | Total Proposed Fenestration Area | | | | | | | | | | | | |
| 16 | Maximum Allowed Fenestration Area | | | | | | | | | | | | |
| 17 | Compliance Statement: | | | | | | | | | | | | |
| 18 | Total Proposed West-Facing Fenestration Area | | | | | | | | | | | | |
| 19 | Maximum Allowed West-Facing Fenestration Area | | | | | | | | | | | | |
| 20 | Compliance Statement: | | | | | | | | | | | | |
| 21 | Proposed Fenestration U-factor (Windows) | | | | | | | | | | | | |
| 22 | Required Fenestration U-factor (Windows) | | | | | | | | | | | | |
| 23 | Compliance Statement: | | | | | | | | | | | | |
| 24 | Proposed Fenestration SHGC (Windows) | | | | | | | | | | | | |
| 25 | Required Fenestration SHGC (Windows) | | | | | | | | | | | | |
| 26 | Compliance Statement: | | | | | | | | | | | | |
| 27 | Proposed Fenestration U-factor (Skylights) | | | | | | | | | | | | |
| 28 | Required Fenestration U-factor (Skylights) | | | | | | | | | | | | |
| 29 | Compliance Statement: | | | | | | | | | | | | |
| 30 | Proposed Fenestration SHGC (Skylights) | | | | | | | | | | | | |
| 31 | Required Fenestration SHGC (Skylights) | | | | | | | | | | | | |
| 32 | Compliance Statement: | | | | | | | | | | | | |

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

**K. Space Conditioning (SC) Systems – Heating/Cooling/Ducts** (Section 150.1(c)7)

Notes:

- Any gas heating, heat pump, or cooling appliance sold in California will meet the minimum appliance efficiency standard. Models can be checked at the Modern Appliance Efficiency Database System (MAEDbS) at https://cacertappliances.energy.ca.gov/Pages/ApplianceSearch.aspx.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SC System Identification or Name | Heating System Type | Heating Efficiency Type | Proposed Heating Efficiency | Cooling System Type | Cooling Efficiency Type | Proposed Cooling Efficiency | Distribution System Type | Duct Location | Duct R-value | Thermostat Type | Comments |
| | | | | | | | | | | | |
| | | | | | | | | | | | |

**L. Ventilation Cooling in Climate Zones 8-14** (Section 150.1(c)12)

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 |
|---|---|---|---|---|---|---|---|
| **Proposed** | | | | | **Required** | | |
| Air Flow Rate (in CFM) for Certified Whole House Fan (CFM) | Number of Fans | Total CFM | Directly Vented to Outside | Attic Free Vent Area (in $ft^2$) | Airflow Rate (CFM) | Minimum Attic Vent Free Area ($in^2$) | Location/Comments |
| | | | | | | | |
| | | | | | | | |

**M. Water Heating Systems** (Section 150.1(c)8)

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

Options:

1. A single 240 volt heat pump water heater (HPWH). Installed in conditioned space or garage.
   a. In climate zone 1, compact hot water distribution is required.
   b. In climate zone 16, compact hot water distribution and a drain water heat recovery system (HERS) is required.
2. A single 240 volt HPW rated Tier 3 or higher by Northwest Energy Efficiency Alliance (NEEA). Installed in conditioned space or garage.
   a. In climate zone 16, a drain water heat recovery (HERS) is also required.
3. A solar water-heating system with a minimum annual solar savings fraction of 0.7 and an electric backup meeting the installation criteria specified in Reference RA4.
4. In climate zones 3, 4, 13, and 14, a gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank may be installed.
   a. Space conditioning system shall be a heat pump as specified in Section 150.1(c)6.

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b. In new dwelling units that are 500 square feet or less, an instantaneous electric water heater with point of use distribution.

5. In new dwelling units that are 500 square feet or less, an instantaneous electric water heater with point of use distribution.

Note:
A single 120V HPWH may be installed in place of a 240V HPWH for new dwelling units with 1 bedroom or less.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
|---|---|---|---|---|---|---|---|---|---|
| Water Heating System ID or Name | Water Heating System Type | System Option (from §150.1(c)8) | # of Water Heaters/ Compressors in System | Water Heater Type | Fuel Type | Rated Input | Tank Location | Distribution Type | Minimum Solar Savings Fraction |
| | | | | | | | | | |
| | | | | | | | | | |

**N. Photovoltaic (PV) Requirements** (Section 150.1(c)14)
Exceptions:

1. Solar Access Roof Area (SARA) is less than 80 contiguous square feet.
2. No PV system is required when the minimum PV system size specified by Section 150.1c(14) is less than 1.8 kWdc.
3. Enforcement authority determines it is not possible for PV system to meet the requirements of the American Society of Civil Engineers, Standard 7-16, Chapter 7, Snow loads.
4. Buildings approved prior to January 1, 2020
5. PV system size is reduced by 25% when installed with a battery storage system meeting the Joint Appendix JA12 requirements with a minimum useable capacity of 7.5 kWh.

| 01 | 02 | 03 | 04 | 05 | 06 | 07 |
|---|---|---|---|---|---|---|
| PV Array ID or Name | Value A from Table 150.1-C | Value B from Table 150.1-C | Minimum PV Size | PV System Sizing Exception Applies | Adjusted PV System Size | Comments |
| | | | | | | |
| | | | | | | |

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

**O. Indoor Air Quality (IAQ) Fan Information**

| 01 | 02 | 03 |
|---|---|---|
| Fan Name | IAQ Type | Comments |
| | | |

**P. HERS Verification Summary**

The enforcement agency shall pay special attention to the HERS Measures specified in this checklist below. A registered Certificate of Verification for all the measures specified shall be submitted to the building inspector before final inspection.

**Quality Insulation Installation – Section 150.1(c)1E**

- The dwelling unit shall meet all requirements of Quality Insulation Installation (QII) as specified in Reference Appendices, Residential Appendix, RA3.5 as verified by a HERS rater.

**Duct Leakage Verification – Section 150.0(m)11**

- Duct leakage testing is required (Reference Appendices, Residential Appendix, RA3.1) in all climate zones for ducted heating and cooling systems.

**Zonally Controlled Systems – Bypass Dampers - Section 150.1(c)13**

- If system is zonally controlled, no bypass ducts are allowed, as confirmed by HERS verification (Reference Appendices, Residential Appendix, RA 3.4.1.6).

**Refrigerant Charge Verification – Section 150.1(c)7a**

- Refrigerant charge testing is required (Reference Appendices, Residential Appendix, RA3.2) in climate zones 2 and 8-15 for all air-cooled air conditioners and air source heat pumps.
- Some exceptions apply to factory charged package systems.

**Central System Air Handlers – Air Flow and Fan Efficacy Verification – Section 150.0(m)13**

- Airflow (minimum 350 cfm/ton) and Fan Efficacy (max 0.45 Watts/cfm for gas furnace air handlers, and 0.58 Watts/cfm for air handlers that are not gas furnaces) on systems with ducted air conditioning as field verified by a HERS rater or Return Duct and Filter System Design according to Tables 150.0-B/C will be HERS verified
- Heat-only systems with Central Fan Integrated (CFI) ventilation are required to have less than 0.45 Watts/cfm as verified by a HERS rater.

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- Small duct high velocity systems: airflow (minimum 250 cfm/ton) and fan efficacy (max 0.62 Watts/cfm) as verified by a HERS rater.

**Indoor Air Quality (IAQ) Mechanical Ventilation – Section 150.0(o)**

- Mechanical ventilation airflow rate according to American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) 62.2 is required to be verified by a HERS rater (Reference Appendices, Residential Appendix, RA3.7).

CALIFORNIA ENERGY COMMISSION

CEC-CF1R-NCB-01-E

***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: |
| Company: | Date Signed: |
| Address: | CEA/ HERS Certification Identification (if applicable): |
| City/State/Zip: | Phone: |

## RESPONSIBLE PERSON'S DECLARATION STATEMENT

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

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

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

## CF1R-NCB-01-E User Instructions

Minimum requirements for prescriptive compliance can be found in Building Energy Efficiency Standards Section 150.1(c), and Table 150.1-A (Package A). Completing these compliance documents will require that you have the Reference Appendices for the 2019 Building Energy Efficiency Standards, which contains the Joint Appendices used to determine climate zone and to complete the table for opaque surfaces. When the term CF1R is used it means the CF1R-NCB-01. Worksheets are identified by their entire name and subsequently by only the worksheet number, such as CF1R-ENV-02.

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

### A. General Information

1. Project Name: Identifying information, such as owner's name.
2. Date: Date of document preparation.
3. Project Location: Legal street address of property or other applicable location identifying information.
4. Building Front Orientation: Building front expressed in degrees, where North = 0, East = 90, South = 180, and West = 270. Indicate cardinal if it is a subdivision or multifamily project that will be 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 (including duplexes and townhomes),. NOTE: Duplexes and townhomes are single family and require a single CF1R for each dwelling unit.
7. Zip Code: 5-digit zip code for the project location (used to determine climate zone).
8. Fuel Type: Natural Gas, or Liquefied Propane Gas.
9. Climate zone: Use the EZ Building Climate Zone search tool at http://caenergy.maps.arcgis.com/apps/webappviewer/index.html?id=4831772c00eb4f729924167244bbca22.
10. Total Conditioned Floor Area: Enter the total new conditioned floor area in $ft^2$, as measured from the outside of exterior walls. If the project is an addition, this form is used only for additions that are greater than 1,000 $ft^2$.
11. Building Type: Single Family (includes duplex),.

12. Slab Area: Area of the first floor slab (if any) in $ft^2$.
13. Project Scope: Newly constructed building, or new addition greater than 1,000 $ft^2$.
14. Fenestration Exceptions: Installing less than or equal to 3 square feet ($ft^2$) glass in door, Installing less than or equal to 3 $ft^2$ tubular skylight, Installing less than or equal to 16 $ft^2$ skylight, or Not Applicable.

**B. Building INsulation Details – Framed Walls/Framed Floors**

1. Tag/ID: A label (if any) from the plans, such as A1.4 or wall.
2. Assembly Type: Wall or Floor (NOTE: ceilings, structural insulated panels (SIP) walls, mass walls and concrete raised floors are entered in different tables).
3. Frame type: Enter wood or metal. If the assembly is a concrete raised floors enter N/A.
4. Frame Depth: Nominal dimensions (in inches) of framing material; such as 2x4 or 2x6.
5. Frame Spacing: 16, 24, or 48 (inches on center).
6. Proposed Cavity R-value: Cavity R-value of insulation installed between framing members.
7. Proposed Continuous Insulation R-value: R-value of rigid or continuous insulation (not interrupted by framing).
8. Proposed U-factor: The U-factor for the proposed assembly from either Reference Appendices, Joint Appendix, JA4 or CF1R ENV-02-E if calculating a weighted average. Must be less than or equal to Column 09 or have an attached CF1R-ENV-02-E to show that a weighted U-factor for multiple assemblies will meet the maximum value.
9. Joint Appendix JA4 Table: Table number used to determine the R-value or U-factor (e.g., a wood framed wall is 4.3.1).
10. Joint Appendix JA4 Cell: Cell number used to determine the R-value or U-factor (e.g., a 2x6 wall R-21 cavity insulation and R-5 continuous insulation is D7).
11. Required U-factor from Table 150.1-A (single family)): Value required based on climate zone and assembly type.
12. Comments: Any notes regarding location, unique conditions, or attachments.

**C. Building Insulation Details – Nonframed**

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Assembly materials: Structural insulated panel (SIP) oriented strand board (OSB), SIP I-Joist, SIP Single 2x, SIP Double 2x, ICF see Reference Appendices, Joint Appendix, JA4 for guidance.
3. Thickness: Thickness in inches.
4. Proposed Core Insulation R-value: Insulation installed within the materials or on the inside. See Reference Appendices, Joint Appendix, JA4 for guidance.
5. Proposed Continuous Insulation R-value: Insulation installed on the exterior. See Reference Appendices, Joint Appendix, JA4 for guidance.

6. Proposed U-factor: Assembly U-factor from Reference Appendices, Joint Appendix, JA4 or CF1R-ENV-02. Must be less than or equal to Column 9 or have an attached CF1R-ENV-02-E to show that a weighted U-factor for multiple assemblies will meet the maximum value in Column 9.
7. Joint Appendix JA4 Table: Table number used to determine the R-value or U-factor (e.g., an insulating concrete form (ICF) wall is 4.3.13).
8. Joint Appendix JA4 Cell: Cell number used to determine the R-value or U-factor (e.g., an 8-inch thick insulated concrete form (ICF) wall with 2 inches of expanded polystyrene (EPS) (R-15.4) is A6).
9. Required U-factor from Table 150.1-A: Based on assembly type and climate zone.
10. Comments: Any notes regarding location, unique conditions, or attachments.

**D. Building Insulation Details – Mass Walls**

1. Tag/ID: A label (if any) from the plans, for example, A1.4 or wall.
2. Walls Above Grade: Yes or No.
3. Mass Type: Clay Brick, Clay Hollow Unit, concrete masonry unit (CMU) Light Weight, CMU Medium Weight, CMU Normal Weight, Concrete. See Reference Appendices, Joint Appendix, JA4 for guidance.
4. Mass Thickness: Thickness (in inches) of mass.
5. Mass Joint Appendix JA4 Reference Table: Table number used to determine the R-value or U-factor (e.g., an insulated concrete form (ICF) wall is 4.3.13).
6. Mass Joint Appendix JA4 Reference Cell: Cell number used to determine the R-value or U-factor (e.g., an 8-inch thick insulated concrete form (ICF) wall with 2 inches of expanded polystyrene (EPS) (R-15.4) is C1).

7-8. Proposed Exterior Insulation R-value or U-factor: Enter the R-value or U-factor of proposed insulation on the outside surface of the mass wall. See Reference Appendices, Joint Appendix, JA4 for guidance. Use the same descriptor (R-value or U-factor) throughout Table D.

9-10. Proposed Interior Insulation R-value or U-facto) of proposed insulation on the inside surface of the mass wall. See Reference Appendices, Joint Appendix, JA4 for guidance. Use the same descriptor (R-value or U-factor) throughout Table D.

11. Insulation Joint Appendix JA4 Table: Table number used to determine the R-value or U-factor (e.g., an insulated concrete form (ICF) wall is 4.3.13).
12. Insulation Joint Appendix JA4 Cell: Cell number used to determine the R-value or U-factor (e.g., an 8-inch thick insulated concrete form (ICF) wall with 2 inches of expanded polystyrene (EPS) (R-15.4) is A6).

13-14. Required Exterior Insulation R-value or U-factor: The required R-value or U-factor (whichever descriptor was selected in Column 7 or 8) for exterior insulation will be completed based on the Table 150.1-A requirements for the wall type.

15-16. Required Interior Insulation R-value or U-factor: The required R-value or U-factor (whichever descriptor was selected in Column 9 or 10) for interior insulation will be completed based on the Table 150.1-A requirements for the wall type.

**E. Slab On Grade/Concrete Raised Floor Insulation**

This section is for insulation requirements for slab on grade, heated slab and concrete raised floors. Slab edge performance specifications and installation criteria are found in Sections 150.0(l) and 150.1(c)1D (Table 150.1-A). Requirements vary by climate zone and slab conditions. Heated slab insulation requirements are from Table 110.8-A.

1. Floor type: Types include slab-on-grade, concrete raised floor, or heated slab.
    - Slab-on-grade floors require slab edge insulation in climate zone 16 only.
    - Concrete raised floors must be insulated to R8 in climate zones 1, 2, 11, 13, 14 and 16, R-4 in climate zones 12 and 15, and no insulation is required in climate zones 3-10.
2. Proposed R-value: When required, insulation can be specified by either R-value or U-factor. If specifying an R-value complete column 2.
3. Proposed U-Factor: When required, specify the U-factor of the proposed insulation in Column 3.
4. Required Insulation R-value: Auto input.
5. Required Insulation U-factor: Auto input.
6. Comments: Any notes regarding location, unique conditions, or attachments.

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

**F. Ceiling/Roof Insulation**

1. Option (B or C): Option B (may require Below Roof Deck Insulation), or Option C (requires any ducts in conditioned space).
2. Air Space Required: Yes or No. If the climate zone and attic/roof option selected require roof deck insulation, an air space is required.
3. Proposed Below Roof Deck R-value: Whether below roof deck insulation is required will vary depending on climate zone.
4. Proposed Ceiling Insulation R-value: The required insulation R-value will vary depending on the option and climate zone.
5. Required Below Roof Deck R-value: This field will be auto populated. The required below roof deck R-value will vary depending on option and climate zone.
6. Required Ceiling Insulation R-value: This field will be auto populated. The required insulation R-value will vary depending on option and climate zone.
7. Radiant Barrier Required?: This field will be auto populated. The radiant barrier requirement will vary depending on option and climate zone.
8. Comments: Any notes regarding location, unique conditions, or attachments.

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

Roofing requirements are found in Sections 110.8(i) and 150.1(c)11. Depending on the climate zone and roof slope, a cool roof (defined as a minimum aged solar reflectance and thermal emittance, or a minimum SRI) may be required for prescriptive compliance.

Exceptions include (1) low-sloped roofs (pitch less than 2:12) in climate zones 1-12, 14 and 16; (2) steep-sloped roofs (pitch greater than or equal to 2:12) in climate zones 1-9 and 16; (3) roof constructions that have thermal mass over the roof membrane with at least 25 pounds per square foot ($lb/ft^2$); and (4) any roof area covered by building integrated photovoltaic (PV) panels and/or solar thermal panels (the area of roof not covered would still need to meet any applicable cool roof requirements).

1. Tag/ID: A label (if any) from the plans, such as R1.
2. Exception: Select 1, 2, or none. (1) roof area with photovoltaic (PV) panels or solar thermal panels, (2) roof constructions with 25 pounds per square foot ($lb/ft^2$) or greater. If exception 1 or 2 exist, the roof is not required to have a cool roof even if the climate zone specifies minimum performance requirements.
3. Roof Pitch: Select from either greater than or equal to 2:12, or pitch is less than 2:12. Typical expressed as 4:12 meaning the roof rises 4 feet in a span of 12 feet. When roofs have multiple pitches the requirements are based on the pitch of 50 percent or more of the roof.
4. Method of Compliance: Indicate if the method of compliance is based on Aged Solar Reflectance and Thermal Emittance, or on the Solar Reflectance Index (SRI).
5. Product Type: See Cool Roof Rating Council's Directory at https://coolroofs.org/directory/roof. Product types include single-ply roof, wood shingles, asphalt roof, metal roof, tile roof.
6. The CRRC Product ID Number is obtained from the Cool Roof Rating Council's Rated Product Directory at https://coolroofs.org/directory/roof. Products are listed by manufacturer, brand, type of installation, roofing material, and color, as well as product performance.
7. Proposed Initial Solar reflectance: Based on the product chosen from the Cool Roof Rating Council's Rated Product Directory at https://coolroofs.org/directory/roof. If using default assumption indicate NA since the Aged Solar Reflectance is available.
8. Proposed Aged Solar Reflectance: Value is from the Cool Roof Rating Council's Rated Product Directory at https://coolroofs.org/directory/roof. If the aged value is not available, calculate the calculated Aged Solar Reflectance using the Solar Reflectance Index (SRI) Calculation worksheet located on the California Energy Commission website at https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiencyor the aging equation $\rho_{aged}=[0.2+\beta[\rho_{initial}-0.2]$, where $\rho_{initial}$ = the initial solar reflectance and soiling resistance β is listed by product type below.

VALUES OF SOILING RESISTANCE β BY PRODUCT TYPE

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

9. Proposed Thermal Emittance: From the product specification default value. If using a calculated solar reflectance index (SRI) place the Thermal Emittance used to calculate SRI.
10. Proposed SRI (optional): It is optional to meet the solar reflectance index (SRI) but if chosen to do so, use the Solar Reflectance Index (SRI) Calculation Worksheet found on the California Energy Commission website at https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency
11. Minimum Required Aged Solar Reflectance: Based on climate zone and roof slope.
12. Minimum Required Thermal Emittance: Based on climate zone and roof slope.
13. Minimum Required SRI (optional): Based on climate zone and roof slope.

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

**H. Opaque Swinging Doors to Exterior**

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

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

a. Maximum Allowed Fenestration Area for All Orientations: Calculated value based on conditioned floor area multiplied by 20 percent for all orientations.

b. Maximum Allowed West-Facing Fenestration Area Only: Calculated value based on conditioned floor area multiplied by 5 percent (Used in climate zones 2, 4, and 6-16 for west-facing fenestration).
c. Maximum Allowed U-factor (Windows): Maximum U-factor from Table 150.1-A. This field will always be 0.30.
d. Maximum Allowed U-factor (Skylights): Maximum U-factor from Table 150.1-A. This field will almost always be 0.30 unless meeting one of the Exceptions to 150.1(c)3A. If meeting one of the Exceptions, this field will be 0.55.
e. Maximum Allowed SHGC (Windows): Maximum SHGC from Table 150.1-A. This field will either be 0.23 or N/R, depending on the climate zone. N/R means there is no maximum SHGC required in this climate zone. The SHGC will be the area weighted averaged, CF1R-ENV-02, with other higher fenestration windows.
f. Maximum Allowed SHGC (Skylights): Maximum SHGC from Table 150.1-A. This field will almost always be 0.23 unless meeting one of the Exceptions to 150.1(c)3A. If meeting one of the Exceptions, this field will be 0.30.
**g.** Comments: Any notes regarding location, unique conditions, or attachments.

**J. Fenestration Proposed Areas and Efficiencies**

1. Tag/ID: Provide a name or designator for each unique type of fenestration surface. This designator should be used consistently throughout the plan set (elevations, finish schedules, etc.) such as Window-1, Skylight-1, etc. to identify each surface. It should also be consistently used on the other forms in the compliance documentation.
2. Fenestration Type: Indicate the type of fenestration construction (e.g., Fixed Window, Operable Window, Skylight, Tubular Skylight, or Glass in Door).

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

3. Frame Type: Indicate the frame type as either metal, metal thermal break, or nonmetal.
4. Dynamic Glazing: Indicate whether the fenestration has an integrated shading device, chromogenic glazing, or none for no dynamic glazing. Chromogenic glazing shall be considered separately from other fenestration types.
5. Orientation: Orientation can be North, East, South, West. If documentation is for a building that may be built in any direction, in a climate zone that limits west-facing fenestration, complete this section assuming the side of the building with the most fenestration faces west.

   NOTE: West includes any vertical fenestration oriented to within 45 degrees of true west, excluding 45 degrees south of west; any skylights oriented west; and skylights facing any direction with a pitch of less than 1:12.

6. Number of Panes: Indicate the number of panes for each Tag/ID; is it a single, double, or triple pane window?
7. Proposed Fenestration Area ($ft^2$): Indicate the area in square feet ($ft^2$) of each exterior fenestration type, excluding west-facing fenestration.
8. Proposed West Facing Fenestration Area ($ft^2$): In climate zones 2, 4, and 6-16, indicate the area in square feet ($ft^2$) of each exterior west-facing fenestration type separately.

   NOTE: Skylights installed in a roof with a pitch less than 1:12 are considered to face west.

9. Proposed U-factor: Enter
   (a) the NFRC U-factor based on the proposed brand and type of fenestration using National Fenestration Rating Council certified values at https://search.nfrc.org/search/Searchdefault.aspx, or
   (b) the default value from Table 110.6-A, or
   (c) the NA6.2 alternate default U-factor (for non-rated site-built fenestration only), or
   (d) the Area-weighted Average from CF1R-ENV-02.

   If any products (other than the exceptions) have a higher U-factor than 0.30, first complete a form CF1R-ENV-02 to calculate the Area-Weighted Average U-factor, which must be 0.30 or less, and attach it to the CF1R-NCB-01.

   NOTE: (1) For the exceptions – up to 3 square feet ($ft^2$) of tubular skylights and up to 16 $ft^2$ of skylight area, enter 0.55.
   (2) For the exception – up to 3 square feet ($ft^2$) of glass in door, enter 0.30.
   (3) Dynamic glazing is a glazing system that changes its performance U-factor and solar heat gain coefficient (SHGC) based on the physical environment. Dynamic glazing includes chromogenic glazing or integrated shading systems (this does not include internally or externally mounted shading devices). If using dynamic glazing, use the lowest tested U-factor and SHGC in Columns 9 and 10.

10. Source: National Fenestration Rating Council (NFRC), Tables 110.6-A and 110.6-B, Equations NA6-1 and NA6-2, or Area-Weighted Average Worksheet (CF1R-ENV-02). The source of the U-factor data for the fenestration product.
11. Proposed SHGC: In climate zones 2, 4, and 6-16, enter the solar heat gain coefficient (SHGC) from
    (a) National Fenestration Rating Council (NFRC) rated certification information; or
    (b) default Table 110.6-B; or
    (c) the NA6.3 alternate default SHGC (for non-rated site-built fenestration only);, or
    (d) the Area-weighted Average from CF1R-ENV-02.

If any products (other than the exceptions) have a higher SHGC than required by Package-A, first complete a form CF1R-ENV-02 to calculate the Area-Weighted Average SHGC and attach it to the CF1R-NCB-01.

NOTE: (1) For the exceptions – up to 3 square feet ($ft^2$) of tubular skylights and up to 16 $ft^2$ of skylight area, enter 0.30.
(2) For the exception – up to 3 square feet ($ft^2$) of glass in door, enter 0.23.

12. Source: National Fenestration Rating Council (NFRC), Tables 110.6-A and 110.6-B, Equations NA6-1 and NA6-2, or Area-weighted Average Worksheet (CF1R-ENV-02). The source of the solar heat gain coefficient (SHGC) data for the fenestration product.
13. Exterior Shading Device: If exterior shading devices are used to meet the solar heat gain coefficient (SHGC) requirement, indicate the type of device (from Table S-1 of CF1R-ENV-03-E Solar Heat Gain Coefficient Worksheet) and attach the CF1R-ENV-03-E.

    NOTE: An exterior shading device is not used for products with an National Fenestration Rating Council (NFRC) rated U-factor and solar heat gain coefficient (SHGC) based on a factory integrated shading device.
    Chromogenic glazing shall be considered separately from other fenestration.

14. Combined SHGC from CF1R-ENV-03: If exterior shading devices are combined with the solar heat gain coefficient (SHGC) value of the fenestration to meet the prescriptive SHGC requirements (as indicated in column I. 13), indicate the SHGC calculated on form CF1R-ENV-03 and attach the form for each window with an exterior shading device.
15.–32. Automatically completed entries; no user input required.

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

1. Space Conditioning System Identification or Name: Provide a unique name for each unique space conditioning system type in the building. If the same space conditioning system type is used in more than one location in the building, it is sufficient to list the unique space conditioning system type only once. In order for one space conditioning system type to be considered the same as another, it must have the same description in Columns 2 through 9.
2. Heating System Type: Indicate heating system type as furnace, central heat pump, boiler, hydronic, wood heat, wall furnace, room heat pump, or electric resistance.
3. Heating Efficiency Type: AFUE, HSPF, HSPF2, COP
4. Proposed Heating Efficiency: Equipment must be certified to the California Energy Commission at https://www.energy.ca.gov/rules-and-regulations/building-energy-efficiency.
5. Cooling System Type: Indicate cooling system type or specify “no cooling system installed.” Categories include central air split system, central air package system, heat pump, room air or room heat pump, mini-split heat pump or air conditioner, multi-split heat pump or air

conditioner, VRF (variable refrigerant flow (VRF) heat pump or air conditioner, small duct high velocity heat pump or air conditioner, or no cooling.

6. Cooling Efficiency Type: SEER, SEER2, EER, EER2, CEER.
7. Proposed Cooling Efficiency: For central cooling systems, the minimum efficiency required by the appliance efficiency standards is 14 SEER. Any cooling appliance sold in California is acceptable.
8. Distribution System Type: This could be ducted, radiant floor, piping, or ductless.
9. Duct Location: If the system has ducts, indicate where they will be installed. Locations include attic, garage, conditioned space, radiant floor. In climate zones 4 and 8-16, unless roof deck insulation is included in Table F (roof option B), the ducts must be located inside conditioned space.
10. Duct R-value: This value is from Table 150.1-A. If system is ductless this field will be N/A.
11. Thermostat Type: Select a setback thermostat or an Energy Management System (EMS) for most systems, or N/A if exempt. Controls for most systems can be by a device that allows a person to program up to 4 temperature setpoints within 24 hours.
12. Comments: Include any comments here.

**L. Ventilation Cooling in Climate Zones 8-14**

One or more whole house fans are required to provide night-time cooling ventilation in climate zones 8-14. The requirement is found in Section 150.1(c)12.

1. Proposed air flow rate for certified whole house fan: Value from appliance directory listing at https://cacertappliances.energy.ca.gov/Pages/Search/AdvancedSearch.aspx
2. Proposed number of fans: Number of fans.
3. Proposed total air flow rate: Column 1 x column 2.
4. Directly vented to outside: Default is No. Yes or No to indicate if the fan is directly vented to outside (not typical).
5. Attic free vent area (in $ft^2$): If column 4 is No, this is the amount of attic venting required for the venting of air from the attic (minimum from column 07
6. Required Whole House Fan Airflow Rate (CFM): 1.5 CFM per square foot ($ft^2$) of conditioned floor area (auto complete).
7. Required Minimum Attic Free Vent Area ($in^2$): Minimum attic vent free area = Column 1 multiplied by 144 and divided by 750, which is equivalent to multiplying by 0.192 (auto complete).
8. Location/Comments: Include any comments or fan location.

**M. Water Heating Systems for Individual Dwelling Units**

1. Water Heating System Identification or Name: Provide a unique name for each unique water heating system type in the building. If the same water heating system type is used in more than one location in the building, it is sufficient to list the unique water heating system type only once.
2. Water Heater 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 are when the water heater will provide both space conditioning and domestic hot water. A central water heater serves multiple dwelling units in a multi-family building.
3. System option:
    1. A single 240 volt heat pump water heater (HPWH). Installed in conditioned space or garage.
        A. In climate zone 1, compact hot water distribution is required.
        B. In climate zone 16, compact hot water distribution and a drain water heat recovery system (HERS) is required.
    2. A single 240 volt HPW rated Tier 3 or higher by Northwest Energy Efficiency Alliance (NEEA). Installed in conditioned space or garage.
        a. In climate zone 16, a drain water heat recovery (HERS) is also required.
    3. A solar water-heating system with a minimum annual solar savings fraction of 0.7 and an electric backup meeting the installation criteria specified in Reference RA4.
    4. In climate zones 3, 4, 13, and 14, a gas or propane instantaneous water heater with an input of 200,000 Btu per hour or less and no storage tank may be installed.
        a. Space conditioning system shall be a heat pump as specified in Section 150.1(c)6.
    5. In new dwelling units that are 500 square feet or less, an instantaneous electric water heater with point of use distribution.
4. # of Water Heaters/Compressors in System: Indicate the number of water heaters/compressors in each system.
5. Water heater Type: Tankless, storage, heat pump.
6. Fuel Type: Gas, Propane, heat pump.
7. Rated Input (Range): Select the maximum input rating
8. Tank Location: List based on which system option was chosen.
9. Distribution Type: Pick Standard, Demand Recirculation – Manual Control, Demand Recirculation – Sensor Control.
10. Minimum Solar Savings Fraction: Field is auto filled based on which system option was chosen.

**N. Photovoltaic (PV) Requirements**

Tables referenced in this section may be found in either the Energy Standards or Chapter 7 of the Residential Compliance Manual.

1. PV Array ID or Name
2. Adjustment Factor (A): Auto-filled look up value from Table 150.1-C.
3. Adjustment Factor (B): Auto-filled look up value from Table 150.1-C.
4. Minimum PV Size: Calculated value for the minimum PV size before any adjustments or exceptions.
5. PV System Sizing Exception Applies: Indicate what, if any, exception is being taken.
6. Adjusted PV System Size: After all adjustments made, required PV.
7. Comments: Include any comments here.

**O. Indoor Air Quality (IAQ) Fan Information**

1. Fan Name: User input
2. IAQ Type: User pick from list: Supply, Exhaust, Balanced, Balanced – ERV, Balanced – HRV, Central Fan Integrated (CFI), Central Ventilation System – Supply, Central Ventilation System – Exhaust, Central Ventilation System – Balanced
3. Comments: User input

**P. HERS Verification Summary**

1. Quality Insulation Installation: All buildings must comply with Quality Insulation Installation (QII) criteria. Multiple inspections, starting with a framing inspection, are required by a HERS rater. QII criteria is specified in Reference Appendices, Residential Appendix, RA3.5.
2. Duct Leakage verification: All ducted systems must meet maximum duct leakage requirements. Typically, the maximum leakage is 5 percent but varies for when the duct leakage test is performed and the type of building (single family, townhouse,). The only exception is if the heating and cooling systems are ductless.
3. Zonally Controlled Systems - Bypass Dampers: The prescriptive requirements preclude the use of bypass ducts in association with zonally controlled systems. A HERS Rater will verify that zonally controlled systems have no bypass ducts.
4. Refrigerant Charge Verification: Some type of refrigerant charge verification or Fault Indicator Display (FID) is required in climate zones 2 and 8-15 for most common systems such as ducted split and packaged systems, and mini-split systems. See Section 150.1(c)7A. or Reference Appendices, Residential Appendix, RA3.2. If a building is built in climate zones 1, 3-17 or 16, or has no cooling system, no refrigerant charge verification is required.
5. Central System Air Handlers - Airflow Rate and Fan Efficacy Verification: Unless a building has no cooling system or has a non-ducted cooling system, the system must meet mandatory and prescriptive requirements for airflow and fan efficacy.
    a. A typical central forced air unit is required to have 350 CFM or greater per ton of nominal cooling capacity, and a fan efficacy less than or equal to 0.45 Watts/CFM; or

b. A central ducted heat pump is required to have 350 CFM or greater per ton of nominal cooling capacity and a fan efficacy of less than or equal to 0.58 Watts/CFM; or
c. Small duct high velocity systems must meet an airflow requirement 250 cfm/ton or greater and a fan efficacy of at least 0.62 Watts/cfm.

See 150.0(m)13, 150.1(c)10, and Reference Appendices, Residential Appendix, RA3.

6. Indoor Air Quality Mechanical Ventilation: All new dwellings are required to meet the whole-building mechanical ventilation airflow rate according to ASHRAE 62.2 is required (RA3.7).

**Documentation Declaration Statements**

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