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| **A. General Information** | | | | | |
| 01 | Dwelling Unit Name |  | 02 | Climate Zone |  |
| 03 | Dwelling Unit Total Conditioned Floor Area (ft2) |  | 04 | Number of Space Conditioning Systems in this dwelling unit |  |
| 05 | Certificate of Compliance Type |  | 06 | Method used to calculate HVAC loads |  |
| 07 | Calculated Dwelling Unit Sensible Cooling Load (Btu/h) |  | 08 | Calculated Dwelling Unit Heating Load (Btu/h) |  |
| 09 | Dwelling Unit Number of Bedrooms |  |  |  |  |

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| **MCH-01d - Space Conditioning Systems Ducts and Fans - For use with Performance E+A+A Certificate of Compliance** |

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| **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 |
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| Notes: | | | | | | | | | | | |

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| **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 | 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 | Minimum  Cooling Efficiency  SEER | Minimum  Cooling Efficiency  EER/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 |
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| **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 (ft2) | 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 |
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| **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? | Installing refrigerant containing component? | Installing new SC System component? | Installing more than 40 feet of ducts? | Installing entirely new duct system? | Installing entirely new SC system? | Alteration Type | Altered  Heating Components | Altered  Cooling Components |
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| **F. Installed Heating System 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) |
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| **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 | Cooling Efficiency  EER | 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) |
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| **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 |  |
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| Notes: | | | | | | | | | |

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| **I. 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 |
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| Notes: | | | | |

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| **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 | System Rated  Cooling Efficiency  EER | System Cooling Capacity at Design Conditions (Btu/h) | Condenser Nominal Cooling Capacity  (ton) |
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| Notes: | | | | | | | | | |

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| **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 | 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) |
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| Notes: | | | | | | | | | | | |

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| **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 | 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) |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
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| Notes: | | | | | | | | | | | | | | |

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| **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 the filter grille displaying the filter grille/rack design airflow rate 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 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  (inch2) | Air Filter Required  Minimum Face Area  (inch2) | Face Area Compliance | Design Allowable Pressure Drop for Air Filter Device  (inch W.C.) |
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| **N. Air Filter Device Requirements** | |
| 01 | The system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through the system's thermal conditioning components. |
| 02 | The 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. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |

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| **O. HERS Verification Requirements for Duct Systems** | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|  |  |  |  | MCH-20 | MCH-21 | MCH-22 | MCH-23 | MCH-28 | MCH-29 | MCH30 |
| 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 | Duct Leakage Test | Duct Location Verification | AHU Fan Efficacy (W/cfm) | AHU Airflow Rate  (cfm/ton) | Return Duct Design - Table 150.0-B or C | Supply Duct Surface Area R-Value Buried Ducts | Central Fan Ventilation Cooling Credit |
|  |  |  |  |  |  |  |  |  |  |  |
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| **P. HERS Verification Requirements for Space Conditioning Equipment** | | | | |
| 01 | 02 | 03 | 04 | 05 |
|  |  | MCH-25 | MCH-26 | MCH-33 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Refrigerant Charge | Rated  SC System  Equipment Verification | VCHP Compliance Credit |
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| Notes: | | | | |

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| **Q. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**  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(b). | |
| 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)2 and 3, and Section 150.0(m)9. | |
| 08 | | Condensing Unit Location: Condensing units shall not be placed within five (5) feet of a dryer vent outlet. See Section 150.0(h)3A. | |
| 09 | | 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. | |
| **Air Distribution System Ducts, Plenums and Fans** | | | |
| 10 | | Insulation: In all cases, unless ducts are enclosed entirely in directly conditioned space, the minimum duct insulation value is R-6. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1. | |
| 11 | | Connections and Closures: All installed air-distribution system ducts and plenums must be, sealed and insulated to meet the requirements of CMC Sections 601.0, 602.0, 603.0, 604.0, 605.0 and ANSI/SMACNA-006-2006: Supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 or enclosed entirely in directly conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8. | |
| **Heat Pump Thermostat** | | | |
| 12 | | A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c). | |
| 13 | | The thermostat shall be installed in accordance with the manufacturers published installation specifications. | |
| 14 | | First stage of heating shall be assigned to heat pump heating. | |
| 15 | | Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met. | |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | | | |

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| **Documentation Author's Declaration Statement** | | | |
| 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/HERS Certification Identification (If applicable): | |
| City/State/Zip: | | Phone: | |
| **Responsible Person's Declaration statement** | | | |
| I certify the following under penalty of perjury, under the laws of the State of California:The information provided on this Certificate of Installation is true and correct.  1. 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. 2. 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. 3. I will ensure 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 made available to the enforcement agency for all applicable inspections. 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. | | | |
| 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-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 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.
8. 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.
9. 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.
2. 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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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.
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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 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 40 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 40 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 that 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 2013 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 2013 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 in multifamily dwellings, and 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) 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) 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 in multifamily dwellings, and 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) 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) 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 40 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 may be qualified for exemptions from the minimum R-value requirement if all of the ducts are located entirely within conditioned space. There are also exemptions for ducts located in interior wall cavities, and for ducts located entirely in conditoned space. The user may select from available choices to indicate the exemption. Note: Selecting Ducts ≥R4.2 entirely in conditioned space will subject the duct system to additional HERS 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 may be qualified for exemptions from the minimum R-value requirement if all of the ducts are located entirely within conditioned space. There are also exemptions for ducts located in interior wall cavities, and for ducts located entirely in conditoned space. The user may select from available choices to indicate the exemption. Note: Selecting Ducts ≥R4.2 entirely in conditioned space will subject the duct system to additional HERS 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 2019 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. HERS 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. HERS 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.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A. General Information** | | | | | |
| 01 | Dwelling Unit Name | <<reference text from CF1R >> | 02 | Climate Zone | << reference text from CF1R>> |
| 03 | Dwelling Unit Total Conditioned Floor Area (ft2) | <<numeric: xxxxx;  **if1 parent is CF1R-PRF**, then  if2 project scope = Newly Constructed (Addition Alone)  then prompt user to enter a value equal to dwelling unit  existing CFA + addition CFA  else reference the value from CF1R endif2  **elseif parent is CF1R-NCB-01**, then  **if3 project scope = New Addition greater than 1,000 ft2**  then prompt user to enter a value equal to dwelling unit  existing CFA + addition CFA  **elseif project scope = Newly Constructed Building, then**  if4 building type = Single Family, then  reference value from CF1R-NCB field A10  elseif Building Type=Multifamily, then  reference value from CF1R-NCB field M02 endif4  endif3  **elseif parent is CF1R-ADD-01**, then  if5 building type= Single Family, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ADD-01  Section J.  elseif Building Type=Multifamily, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ADD-01  Section L. endif5  **elseif parent is CF1R-ALT-01**, then  if6 building type= Single Family, then  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ALT-01  Section G.  **elseif Building Type=Multifamily, then**  reference value from field A08 from the CF1R-ALT-02 that is  required for the dwelling unit according to CF1R-ALT-01  Section letter I. endif6  elseif parent is CF1R-ALT-02, then  reference value from CF1R-ALT-02 field A08. endif1  allow user to override default and input a value; flag overridden values and report in project status notes field >> | 04 | Number of Space Conditioning Systems in this dwelling unit | <<integer: xx; If parent is CF1R-ALT-02 doc type, then use as default the value referenced from CF1R ALT-02 Section A (field A10); or allow user to override the default and input a new value; flag non-default values and report in project status notes field;  elseif parent is not CF1R-ALT-02 doc type, then user input the integer value>> |
| 05 | Certificate of Compliance Type | << reference document type property from CF1R: allowed values: performance (CF1R-PRF); or prescriptive additions/alterations (CF1R-ADD/CF1R-ALT); or prescriptive newly constructed (CF1R-NCB)>> | 06 | method used to calculate HVAC loads | <<user select from list:  \*ASHRAE Handbook;  \*SMACNA Residential Comfort System Installation Standards Manual;  \*ACCA Manual J  \*n/a equipment changeout, like-for-like>> |
| 07 | Calculated Dwelling Unit Sensible Cooling Load (Btu/h) | <<user entry: numeric: xxxxx (allow n/a entry if "n/a equipment changeout, like-for-like" is selected in A06) >> | 08 | Calculated Dwelling Unit Heating Load (Btu/h) | <<user entry: numeric: xxxxx (allow n/a entry if "n/a equipment changeout, like-for-like" is selected in A06) >> |
| 09 | Dwelling Unit Number of Bedrooms | <<<<calculated field: integer xx:  if CertComplianceType=performance, then use as default the value referenced from CF1R-PRF or allow user to override the default and input a new value constrained to be greater than or equal to the default value from the CF1R-PRF;  flag non-default values and report in project status notes field;  elseif parent is not CF1R-PRF doc type, then user input the integer value xx>> | 10 | Determination of Mech01 type (this field not visible to user) | <<calculated field:  if1 CertComplianceType=performance, then  if2 CF1R-PRF Project Scope=one of the  following two types:  \*\*Addition and/or Alteration  \*\*Newly Constructed - Addition Alone  then display doc variation MCH-01d;  elseif CF1R-PRF Project Scope=Newly  Constructed,  then display doc variation MECH01a  endif2  elseif CertComplianceType=prescriptive additions/alterations,  then display doc variation MECH01b,  elseif CertComplianceType=prescriptive newly constructed,  then display doc variation MECH01c  (this field not visible to user) endif1>> |

|  |
| --- |
| **MCH-01d - Space Conditioning Systems Ducts and Fans - For use with Performance E+A+A Certificate of Compliance** |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **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.  <<require one row of data for each SC System identified on the CF1R report that is applicable to this dwelling unit; do not allow user to overwrite these referenced data >> | | | | | | | | | | | |
| 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 |
| <auto filled text: referenced from CF1R>> | << auto filled text: Reference from CF1R>> | <<if on the CF1R, Y02\_ResidentialHeatingSystemType=VCHP, then allow user to select from list: \*VCHP-Ducted, \*VCHP-Ductless, \*VCHP-Ducted+Ductless; else autofill from CF1R>>Note: assume the VCHP and multisplit system types will be included in CBECC, thus included in the allowed values in this field:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*ducted mini-split HP | <<if on the CF1R, Y02\_ResidentialHeatingSystemType=VCHP, then allow user to select from list: \*VCHP-Ducted, \*VCHP-Ductless, \*VCHP-Ducted+Ductless; else autofill from CF1R>>  Note: assume the VCHP and multisplit system types will be included in CBECC, thus included in the allowed values in this field:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*multisplit AC-ducted  \*multisplit AC-ductless  \*multisplit AC-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*ducted mini-split AC  \*ducted mini-split HP | <<if on the CF1R, Central Fan Vent Cooling credit is not claimed for this system or if value is not available from CF1R, then value=N/A, else autofill value from CF1R. allowed values are:  \*variable flow  \*fixed flow>> | << If on the CF1R-PRF Y02\_ResidentialHeatingSystemType = VCHP\_IndoorUnitDucted, VCHP\_IndoorUnitDuctless, or VCHP\_IndoorUnitDuctedandDuctless, then report N/A; else auto filled text: referenced from CF1R>> | <<auto filled text referenced from CF1R>> | <<auto filled text referenced from CF1R,  if cooling system type (B04) = NoCooling,  then display result=N/A  >> | <<auto filled text referenced from CF1R, if cooling system type (B04) = NoCooling,  then display result=N/A  >> | <<if on CF1R  LowLkgAH=  true, then value=  \*Has Low Leakage Air Handler,  elseif LowLkgAH=  false or if value is not available from CF1R, then value=  \*None>> | <<calculated field: reference value from CF1R for this system name.  values are:  \*\*new  \*\*altered  \*\*existing>> | <<calculated field: if B06=  DuctsNone, then value=N/A,  else reference value from CF1R for this system name.  allowed values are:  \*\*new  \*\*altered  \*\*existing  \*\*existing+new;  Elseif value is not available from CF1R, value = N/A >> |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 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.  <<require one row of data for each SC System in Section B; do not allow user to overwrite these referenced data>> | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 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 | Minimum  Cooling Efficiency  SEER | Minimum  Cooling Efficiency  EER/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 |
| <<auto filled text: referenced from B01>> | <<If B03 = ‘Combined Hydronic’ then report NA; else auto fill text referenced from CF1R for this system name>> | <<If B03 = ‘Combined Hydronic’ then report NA; else auto fill text referenced from CF1R for this system name>> | << auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A >> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A >> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | <<auto filled text: referenced from CF1R for this system name if the data is available;  else if the system type on the CF1R does not provide this data,  then result=N/A>> | << calculated field:  if CF1R flags requirement for a Verified Duct System Design, then display text:  Verified Duct  System Design,  else reference the R-value from the CF1R for this system name if the data is available  else if CF1R does not provide R-value data for this system,  then result=N/A>> | <<if B05=N/A, then value= N/A,  elseif B05= \*fixed flow"  then reference the fixed cool vent airflow value from the CF1R for this system,  elseif B05=  \*variable flow"  then value= the maximum cool vent airflow from the CF1R for this system>> | <<if B05=N/A, then value= N/A,  else reference the value from the CF1R for this system>> |
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| Notes: | | | | | | | | | | | |

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| **D. Installed New, Altered, and Existing Space Conditioning (SC) System Component Information**  << require one row of data to be entered in this table for each of the quantity of space conditioning systems entered in A04. If SC system names from CBECC are installed more than once in this dwelling unit, then duplicate SC System names are allowed in column D01; Require each entry in D02 (area served) to be unique in this dwelling unit >> | | | | | | | | | | | | |
| 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 (ft2) | 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 for this System |
| <<require user to select applicable system name from a list comprised of the systems identified in column B01; If SC system names from CBECC are installed more than once in this dwelling unit, then duplicate SC System names are allowed in this field >> | <<user input, text, 15 characters maximum  Require each entry to be unique in this dwelling unit i.e. unique within the scope of this instance of the MCH-01>> | << user input, numeric, xxxx;  \*Require the sum of the values in this column to be equal to the value in A03 as condition of completion of this doc>> | <<if SC system is not shown in section B, then user pick one from either List A or list B below,  else reference value from B03 as default;  do not allow user to override values from B03 that are shown in List A below:  List A:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*ductless mini-split HP;  \*ductless VRF HP;  \*ducted mini-split HP  \*small duct high velocity HP;  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*room HP;  \*air-to-water HP  \*ground-source HP  otherwise allow user to override the default and pick one from list B below:  List B:  \*central gas furnace;  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*boiler;  \*hydronic;  \*combined hydronic;  \*hydronic+forced air;  \*combined hydronic+forced air;  \*hydronic HP,  \*hydronic HP+forced air;  \*gas wall furnace;  \*gas space heater;  \*electric ;  \*Wood Heat;  \*Packaged gas furnace  \*flag non-default values and report in project status notes field; a revised CF1R may be required >> | << if SC system is not shown in section B, then user pick one from list A below,  else reference value from B04 as default;  if B04 = No Cooling, then allow user to override default and pick:  \*central split AC;  flag non-default values and report in project status notes field; a revised CF1R may be required >>  note: allowed values in B04 may include the values in List A below.  ListA:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC ;  \*central large packaged HP  \*gas absorption AC  \*room AC;  \*room HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*evaporative - direct  \*evaporative - indirect  \*evaporative - indirectdirect  \*evaporatively cooled condenser  \*Ice Storage AC  \*no cooling;  \*small duct high velocity HP;  \*small duct high velocity AC;  \*ductless mini-split AC;  \*ductless mini-split HP;  \*ductless VRF HP;  \*ductless VRF AC;  \*ducted mini-split AC  \*ducted mini-split HP  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  \*multisplit AC-ducted  \*multisplit AC-ductless  \*multisplit AC-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless | <<<<**if** [D04 or D05] = one of the following system types:  \*room HP  \*gas wall furnace;  \*gas space heater;  \*electric ;  \*Wood Heat;  \*Packaged gas furnace  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC ;  \*central large packaged HP  \*room AC;  \*room HP;  \*evaporative - direct  \*evaporative - indirect  \*evaporative - indirectdirect  then text value=N/A,  elseif B05= one of the following two values:  \*variable flow  \*fixed flow,  then value=1,  elseif the CF1R requires use of a Central Fan Integrated (CFI) IAQ Ventilation system, then value=1,  else default integer value =1;  allow user to overwrite the default to enter one of the following two:  1: an integer value greater than 1  2: text value=N/A>> | << if SC system is not shown in section B, then user pick one from list below,  **elseif** D04=  \*VCHP-Ducted  **then** value in this field=  \*LowLlCod - Verified low-leakage ducts in conditioned space,  **elseif** D04=  \*VCHP-Ductless  **then** value in this field=  \*DuctsNone - Air distribution systems without ducts,  **elseif** D04=  \*VCHP-Ducted+Ductless  **then** value in this field=  \*Multiple split Indoor Units combined Ducted and Ductless.  else:reference value from B06 as default. Allow user to overwrite only the following default values from B06:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor**  **\*N/A;**  If overriding pick one from list:  **\*DuctsAttic** - Ducts located overhead in unconditioned attic  **\*DuctsCrawl** - Ducts located underfloor in unconditioned crawl space  **\*DuctsGarage** - Ducts located in an unconditioned garage  **\*DuctsInEx12** - Ducts located within the conditioned space (except < 12 lineal ft)  **\*DuctsInAll** - HVAC system(s) with all HVAC ducts located in conditioned space  **\*DuctsNone** - Air distribution systems without ducts  **\*DuctsOutdoor** - Ducts located in exposed outdoor locations  **\*LowLlCod** - Verified low-leakage ducts in conditioned space  \*Ducts located in multiple places  \* Multiple split Indoor Units combined Ducted and Ductless .  flag non-default values and report in project status notes field; a revised CF1R may be required >> | << if SC system is not shown in section B, **then** user pick one from list below,  \*setback  \*Ocupant Controlled Smart Thermostat (OCST) per JA5  \*Energy Management Control System (EMCS)  **else** reference value from B07 as default;  allow user to override the default and pick one from list:  \*Setback  \*Ocupant Controlled Smart Thermostat (OCST) per JA5  \*Energy Management Control System (EMCS)>> | <<calculated field: reference value from B08 as default; else if cooling system type (D05) = NoCooling, then override default and display result=NA; else allow user to override the default and pick one from list: \*Zonally Controlled,  \*Not Zonal;  flag non-default values and report in project status notes field; a revised CF1R may be required>> | <<calculated field: reference value from B09 as default;  else:  if cooling system type (D05) = NoCooling,  then override default and display result=n/a;  else:  allow user to override the default and pick one from list:  \*Multi-Speed \*Single Speed  flag non-default values and report in project status notes field; a revised CF1R may be required>> | <<calculated field: if SC system is not shown in section B, then user pick one from list:  \*\*new  \*\*altered  \*\*existing  else reference value from B11 as default; allow user to override the default and pick one from list:  \*\*new  \*\*altered  \*\*existing  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<calculated field:if SC system is not shown in section B, then user pick one from list:  \*\*new  \*\*altered  \*\*existing  \*\*existing+new  elseif D07=  DuctsNone, then value=N/A,  else  reference value from B12 as default; allow user to override the default and pick one from list  \*\*new  \*\*altered  \*\*existing  \*\*existing+new  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<**if** D07=DuctsNone; **then** value=N/A  **elseif** D07= one of the ducted types  \*DuctsAttic,,  \*DuctsGarage,  \*DuctsOutdoor,  \*DuctsCrawl,  \*DuctsGarage,  \*DuctsInEx12,  \*DuctsInAll,  \*DuctsOutdoor,  \*LowLlCod,  \*Ducts located in multiple places;  **then** value= same value as D06;  **elseif** D07=  \* Multiple split Indoor Units combined Ducted and Ductless;  **then** prompt user to enter integer value ≤ the value in D06>> |
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| Notes: | | | | | | | | | | | | |

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| **E. Space Conditioning (SC) System Alteration Type Determination**  << **if** there are no SC systems listed in Section D for which D11 = one of the following two values: 1:[altered]; 2:[existing], and there are no SC systems listed in section D for which D12= one of the following three values: 1:[altered]; 2:[existing], 3:[existing+new], then display the section does not apply message,  **else** require one row of data to be entered in this table for each SC system listed in Section D for which D11 = one of the following two values: 1:[altered]; 2:[existing],  **ALSO** require one row of data to be entered in this table for each SC system listed in Section D for which D12= one of the following three values: 1:[altered]; 2:[existing], 3:[existing+new]>> | | | | | | | | | | |
| 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? | Installing refrigerant containing component? | Installing new SC System component? | Installing more than 40 feet of ducts? | Installing entirely new duct system? | Installing entirely new SC system? | Alteration Type | Altered  Heating Components | Altered  Cooling Components |
| <<auto filled text: referenced from D01>> | <<auto filled text: referenced from D02>> | <<calculated field: if D07=  DuctsNone, then value=no,  else value=yes>> | <<user pick from list: "yes"; or "no">> | <<user pick from list: "yes"; or "no">> | <<as default:  **If** value from CF1R= [>40ft];  **then** value=yes, **elseif** value from CF1R=one of the following 2:  \*≤40ft;  \*N/A - no ducts  **then** value=no  **elseif** value is not available from CF1R, **then** value=no  allow user to override the default and pick one from following 2:  \*yes  \*no  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<user pick from list: "yes"; or "no">> | <<user pick from list: "yes"; or "no">> | << Calculated field: determine the correct result for "alteration type" for entry in this field by the user responses in E03, E04, E05, E06, E07, E08 and use of "Logic Table for Determining Alteration Type and HERS Verification Requirements" (logic table is inserted below this section); constrain user input for fields E03, E04, E05, E06, E07, E08 to allow only the available combinations of responses given in the Logic Table in rows a through t; alteration types are:  \*Extension of Existing Duct System;  \*Altered Space Conditioning System;  \*Entirely New or Complete Replacement Duct System with or without Equipment Changeout;  \*Entirely New or Complete Replacement Space Conditioning System  \*No alteration Performed >> | <<Calculated field: if E09= No alteration Performed, then value in this field= no heating component altered,  else prompt user to pick as many as are applicable from the following list:  \*gas furnace AHU;  \*Packaged gas furnace  \*wall furnace  \*indoor fancoil AHU;  \*outdoor condensing unit;  \*outdoor package unit  \*indoor coil;  \*boiler;  \*TXV or EXV;  \*compressor;  \*refrigerant lineset;  \*no heating component altered>> | << Calculated field: if E09= No alteration Performed, then value in this field= no cooling component altered,  else prompt user to pick as many as are applicable from the following list:  \*outdoor condensing unit,  \*outdoor package unit  \*indoor fancoil AHU,  \*indoor coil,  \*non-furnace AHU  \*TXV or EXV,  \*Compressor,  \*refrigerant lineset,  \*no cooling component altered>> |
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| Notes: | | | | | | | | | | |

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| **Logic Table for Determining Alteration Type and HERS Verification Requirements (this table not shown on the completed document)** | | | | | | | | | |
|  | **1** | **2** | **3** | **4** | **5** | **6** | 7 | 8 | 9 |
|  | Is the altered or installed system a ducted system? | Altering or installing a refrigerant containing component? | Installing new components? (packaged unit, or condensing unit, or cooling/heating coil, or air-handling unit, etc) | Installing more than 40 linear feet of new or replacement ducts? | Is the entire duct system accessible for sealing, and is more than 75% of the duct system new or replaced? | Are all of the system's components and ducts new or replaced? (entirely new system) | alteration type | HERS | notes |
| **a** | no | yes | no | no | no | no | Altered space conditioning system | RC | e.g. alteration to refrigerant containing component - mini-split or packaged AC |
| **b** | no | yes | yes | no | no | no | Altered space conditioning system | RC | e.g. changeout mini-split system component |
| **c** | yes | no | yes | no | no | no | Altered space conditioning system | DctLk | e.g. new ducted hydronic fan coil unit or furnace |
| **d** | yes | no | yes | yes | no | no | Altered space conditioning system | DctLk | e.g. new furnace + duct alteration |
| **e** | yes | yes | no | no | no | no | Altered space conditioning system | RC | e.g. alteration to a refrigerant containing component - split system |
| **f** | yes | yes | yes | no | no | no | Altered space conditioning system | RC + DctLk | e.g. changeout refrigerant containing components |
| **g** | yes | yes | yes | yes | no | no | Altered space conditioning system | RC + DctLk | e.g. changeout refrigerant containing component + altered ducts |
| **h** | yes | yes | no | yes | no | no | Altered space conditioning system | RC + DctLk | e.g. alteration to refrigerant containing component + altered ducts |
| **i** | yes | no | no | yes | yes | no | Entirely new duct system with or without Equipment Changeout | DctLk + FE/AF or Tbl150.0-C,D | e.g. new duct system without equipment changeout |
| **j** | yes | no | yes | yes | yes | no | Entirely new duct system with or without Equipment Changeout | DctLk + FE/AF or Tbl150.0-C,D | e.g. new furnace + new duct system |
| **k** | yes | yes | no | yes | yes | no | Entirely new duct system with or without Equipment Changeout | RC + DctLk + FE/AF or Tbl150.0-C,D | e.g. alteration to a refrigerant containing component + new duct system |
| **l** | yes | yes | yes | yes | yes | no | Entirely new duct system with or without Equipment Changeout | RC + DctLk + FE/AF or Tbl150.0-C,D | e.g. changeout refrigerant containing component + new duct system |
| **m** | no | no | yes | no | no | yes | Entirely new space conditioning system | none | e.g. entirely new ductless hydronic heating system (boiler heating only); or new wall heater |
| **n** | no | yes | yes | no | no | yes | Entirely new space conditioning system | RC | e.g. new mini-split (weigh-in); or new room packaged AC (factory charged) |
| **o** | yes | no | yes | yes | yes | yes | Entirely new space conditioning system | DctLk | e.g. new ducted hydronic heating system, or other new ducted heating-only system |
| **p** | yes | yes | yes | yes | yes | yes | Entirely new space conditioning system | RC + DctLk + FE/AF or Tbl150.0-C,D | e.g. new split system |
| **q** | yes | no | no | yes | no | no | Extension of an existing duct system | DctLk | e.g. altered ducts |
| **r** | no | no | no | no | no | no | System is exempt from the alteration requirements | none | no alteration performed |
| **s** | yes | no | no | no | no | no | System is exempt from the alteration requirements | none | no alteration performed |
| **t** | yes | yes | yes | no | yes | yes | Entirely new space conditioning system | RC + DctLk + FE/AF or Tbl150.0-C,D | e.g. new ducted system that has less than 40 ft of ducts |
| **u** | no | no | yes | no | no | no | Altered space conditioning system | none | e.g. new ducted hydronic fan coil unit or new hydronic heating boiler |
| Nomenclature:  RC = Refrigerant Charge Verification (MCH-25)  DctLk = Duct Leakage Test (MCH-20)  FE/AF or Tbl150.0-C,D - Fan Efficacy and Airflow Rate verification (MCH-22; MCH-23) or alternative compliance: (MCH-28) | | | | | | | | | |

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| **F. Installed Heating System Equipment Information (not heat pumps)**  <<<if all of the SC Systems listed in Section D have a value in D04 = one of the heat pump types (see HP list that follows below), AND if Section E applies but all of the SC Systems listed in Section E have a value in E10=no heating component altered, then display the section does not apply message;  **else** for each of the SC Systems in Section D that meet BOTH of the following two criteria: 1:[D11=new], 2:[D04 ≠ one of the heat pump types in the list that follows below], do the following two actions:  1:[require one row of data for each of the SC systems in section D column D02 for which D06=N/A  2:[for systems for which D06 ≥1, and D04=[central gas furnace]; require one row of data to be entered in this table for each of the quantity of indoor units specified in D06 for that system;  **Also** **if** Section E applies, **then** for each of the SC Systems in Section E that meet both BOTH of the following two criteria: 1:[D11=altered], 2:[E05=yes], do the following two actions:  1:[**if** E10=one of the following three heating component types: {gas furnace AHU}; {wall furnace}; {boiler};], require one row of data to be entered in this table for each of the quantity of indoor units specified in D06 for that system.  2:[if E10= {packaged gas furnace}, then require one row of data to be entered in this table for that system. | | | | | | | | | | | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless mini-split HP; | | | \*hydronic HP,  \*hydronic HP+forced air;  \*room HP;  \*ducted mini-split HP | | | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless | | |
| 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) |
| <<auto filled from D01>> | <<auto filled from D02>> | << **if** value in D06=N/A,  **then** value=N/A  **elseif** value in D06=1,  **then** value autofilled from D02;  **else** user input, text, 15 characters maximum;  as default, require value to be unique in this dwelling unit (i.e. unique within the scope of this instance of the MCH-01) except for the case when all the following three conditions are true:  1:[F01=H01]  2:[F02=H02]  3:[D04= {central gas furnace}]  allow user to override the default uniqueness rule if necessary>> | | <<**if** D06 > 1, then value=no;  **elseif** building type on the CF1R = multifamily, **then** value=no,  **elseif** IAQ vent system type for this dwelling on the CF1R=one of the following three,  \*Balanced,  \*Balanced ERV  \*Balanced HRV,  **then** value=no,  **elseif** D06=N/A,  and D04=Packaged gas furnace,  **then** user pick one from list:  \*Yes  \*No  **else**,user pick one from list:  \*Yes  \*No>> | << if the distribution system type value in D07 =DuctsNone,  then value=Ductless;  elseif, D07=one of the  Ducted types: \*DuctsAttic, \*DuctsCrawl, \*DuctsGarage, \*DuctsInEx12, \*DuctsInAll, \*DuctsOutdoor, \*LowLlCod,  \*Ducts located in multiple places,  then user pick one of the following two values:  \*Ducted>10ft length  \*Ducted ≤10ft length  else, if D07=-  \*Multiple split Indoor Units Mixed Ducted and Ductless,  then user pick one of the following three values:  \*Ductless  \*Ducted >10ft length  \*Ducted ≤10ft length>> | | <<if SC system is not shown in section C, then user pick one from list: \*AFUE;  \*COP;  \*HSPF, or  \*NA  else as default reference the value from C02; allow user to override default and pick from list  \*AFUE;  \*COP;  \*HSPF; or  \*NA  flag non-default values and report in project status notes field; a revised CF1R may be required >  > | <<If C03 = NA, then value = NA; else user input, numeric, 100.0 ≥ xx.x ≥ 0.0;  if the SC System is shown in Section C, then, check value entered by user in this field F07must be ≥ value shown in C03 to comply, else flag as non-compliant value and do not allow registration to proceed  elseif the SC System is NOT shown in Section C, then, end>> | | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | <<user input, numeric, xxxxxx>> |
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| Notes: | | | | | | | | | | | | | | |

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| **G. Installed Cooling System Outdoor Condensing Unit or Package Unit Equipment Information (not heat pumps)**  << **if** all of the SC Systems listed in Section D have a value in D05= No Cooling, **and** **if** Section E applies but all of the SC Systems listed in Section E have a value in E11=no cooling component altered, **then** display the section does not apply message;  **else** require one row of data to be entered in this table for each of the SC Systems in Section D that meet ALL of the following 3 criteria: 1:[D11=new], 2:[D05≠no cooling], 3:[D05 ≠ one of the heat pump types in the list that follows below];  **ALSO** if Section E applies require one row of data to be entered in this table for each of the SC Systems in Section E that meet ALL of the following four criteria: 1:[D11=altered], 2:[E05=yes], 3:[D05 ≠ one of the heat pump types in the list that follows below] 4:[E11=one of the following two cooling component types: {outdoor condensing unit}; {outdoor package unit}]; | | | | | | | | | | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ducted mini-split HP | | | \*ductless mini-split HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*room HP; | | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> | | |
| 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 | | Cooling Efficiency  EER | | 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) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<**if** SC system is NOT shown in section C, **then** prompt user to input numeric value, xx.x;  **elseif** SC system IS shown in section C, and value in C06=N/A, **then** result=NA;  **else** require user to input, numeric value xx.x;  **check** values entered by user in this field (G03) must be ≥ value in C06, to comply  else flag non-compliant values and do not allow registration to proceed>> | | <<if SC system is NOT shown in section C, then prompt user to input, numeric value, xx.x;  **elseif** SC system IS shown in section C, and value in C07=N/A, **then** result=NA;  **else** require user to input, numeric value, xx.x;  **and check** value entered by user in this field (G04) must be ≥ value in C07, to comply except if one of the following two conditions are applicable:  cond 1:  **if** B04 = {central packaged AC}, **and** 12.2 > value ≥11.0  **then** the system complies;  cond 2:  **if** B04 = "central split AC", **and** G10 < 45000,  **then** value must be ≥ 12.2 to comply.  else flag non-compliant values and do not allow registration to proceed>> | | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | <<user input, numeric, xxxxxx>> | | <<user input, numeric, x.x>> | <<user input, numeric, xxxxxx>> |
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| **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.  <<**if** none of the SC Systems listed in Section D have a value in either D04 or D05 = one of the system types in the list that follows below, **then** display the section does not apply message;  **else** for each of the SC Systems listed in Section D that meet both BOTH of the following two criteria: 1:[D11=new]; 2:[{D04 or D05}=one of the system types in the list that follows below], require one row of data to be entered in this table for each of the quantity of indoor units specified in D06 for that system;  **Also** if Section E applies, then for each of the SC Systems in Section E that meet ALL of the following three criteria: 1:[D11=altered], 2:[E05=yes]; 3:[{E10 or E11}=one of the following three component types: {indoor fancoil AHU}; {indoor coil}; {non-furnace AHU}], require one row of data to be entered in this table for each of the quantity of indoor units specified in D06 for that system. | | | | | | | | | | | | | | |
| \*central split AC;  \*central split HP  \*ductless mini-split AC;  \*ductless mini-split HP;  \*ducted mini-split HP | | | \*hydronic + forced air;  \*combined hydronic + forced air;  \*hydronic HP+forced air;  \*gas absorption AC;  \*ducted mini-split AC | | \*evaporatively cooled condenser;  \*Ice Storage AC;  \*small duct high velocity AC;  \*small duct high velocity HP; | | | \*ductless VRF AC;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | | \*multisplit AC-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ductless | | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless >> |
| 01 | 02 | 03 | | 04 | | 05 | 06 | | 07 | | 08 | | 09 | |
| SC System ID/Name | 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 | |
| <<auto filled from D01>> | <<auto filled from D02>> | << **if** value in D06≥ 1,  **and** ALL of the following three conditions are true:  1:[F01=H01]  2:[F02=H02]  3:[D04=central gas furnace]  **then** value = same value as F03;  **elseif** value in D06=1,  **then** value autofilled from D02;  **else** user input, text, 15 characters maximum;  as default, require each entry to be unique in this dwelling unit (i.e. unique within the scope of this instance of the MCH-01), except for the case when all the following three conditions are true:  1:[F01=H01]  2:[F02=H02]  3:[D04=central gas furnace]  allow user to override the default uniqueness rule if necessary>> | | <<user pick from list:  \*HP coil  \*AC Coil  \*fancoil AHU  \*non-furnace AHU+coil>> | | << **if** value in D06≥ 1,  **and** ALL of the following three conditions are true:  1:[F01=H01]  2:[F02=H02]  3:[D04=central gas furnace]  **then** value = same value as F05;  **elseif** the distribution system type value in D07 =DuctsNone,  then value=Ductless;  **elseif**, D07=one of the  Ducted types: \*DuctsAttic, \*DuctsCrawl, \*DuctsGarage, \*DuctsInEx12, \*DuctsInAll, \*DuctsOutdoor, \*LowLlCod,  \*Ducts located in multiple places,  **then** user pick one of the following two values:  \*Ducted>10ft length  \*Ducted ≤10ft length  **else**, if D07=-  \*Multiple split Indoor Units Mixed Ducted and Ductless,  then user pick one of the following three values:  \*Ductless  \*Ducted >10ft length  \*Ducted ≤10ft length>> | << **if** value in D06≥ 1,  **and** ALL of the following three conditions are true:  1:[F01=H01]  2:[F02=H02]  3:[D04=central gas furnace]  **then** value = same value as F04;  **elseif** D06> 1,  **then** value=no;  **elseif** building type on the CF1R= multifamily, **then** value=no,  **elseif** IAQ vent system type for this dwelling on the CF1R= Balanced,  **then** value=no,  else,user pick one from list:  \*Yes  \*No>> | | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | | <<user input alphanumeric text string max 50 characters>> | |
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| **I. Installed Heat Pump System – Split System Condensing Unit or Package Unit Equipment Information**  <<<**if** none of the SC Systems listed in Section D have a value in D04 or D05 = one of the heat pump types in the list that follows below, **then** display the section does not apply message;  **else** require one row of data to be entered in this table for each of the SC Systems listed in Section D that meet BOTH of the following two criteria: 1:[D11=new] 2:[D04 or D05 = one of the heat pump types in the list that follows below];  **Also** if Section E applies, require one row of data to be entered in this table for each of the SC Systems in Section E that meet ALL of the following four criteria: 1:[D11=altered], 2:[E05=yes], 3:[D04 or D05 = one of the heat pump types in the list that follows below]; 4:[E10 or E11=one of the following two component types: {outdoor condensing unit}; {outdoor package unit}]  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless mini-split HP;  \*ducted mini-split HP  \*room HP  \*hydronic HP,  \*hydronic HP+forced air;  \*small duct high velocity HP;  \*ductless VRF HP  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*air-to-water HP  \*ground-source HP >> | | | | |
| 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 |
| <<auto filled from D01>> | <<auto filled from D02>> | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> | <<user input alphanumeric text string max 50 characters>> |
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| Notes: | | | | |

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| **J. Installed Heat Pump System – Efficiency and Performance Compliance Information**  <<<**if** none of the SC Systems listed in Section D have a value in D04 or D05 = one of the heat pump types in the list that follows below, **then** display the section does not apply message;  **else** require one row of data to be entered in this table for each of the SC Systems listed in Section D that meets BOTH of the following two criteria: 1:[D11=new] 2:[D04 or D05 = one of the heat pump types in the list that follows below];  **Also** if Section E applies, require one row of data to be entered in this table for each of the SC Systems in Section E that meet ALL of the following four criteria: 1:[D11=altered], 2:[E05=yes]; 3:[D04 or D05 = one of the heat pump types in the list that follows below]; 4:[E10 or E11=one of the following two component types: {outdoor condensing unit}; {outdoor package unit}]>> | | | | |
| \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ducted mini-split HP | \*ductless mini-split HP;  \*hydronic HP,  \*hydronic HP+forced air;  \*room HP; | \*small duct high velocity HP;  \*ductless VRF HP  \*air-to-water HP  \*ground-source HP | \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless | \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless>> |

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| 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 | System Rated  Cooling Efficiency  EER | System Cooling Capacity at Design Conditions (Btu/h) | Condenser Nominal Cooling Capacity  (ton) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<reference value from C02; note: values may be  \*AFUE;  \*COP;  \*HSPF; or  \*NA>> | <<**If** C03 = NA, then report NA; else user input, numeric, 100.0≥xx.x≥0.0;  **and** for all systems except for those with a value in D04 = one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  **check** value must be ≥ value in C03 to comply; else flag non-compliant value and do not allow registration to proceed>> | << **if** value in C04=N/A,  **then** result=NA;  **else** user input, numeric, xx.x; **check** value must be ≥ value in C04 to comply;  **else** flag non-compliant value and do not allow registration to proceed>> | << **if** value in C05=N/A, then result=NA;  **else** prompt user to input one of the following two options:  1:[user select text value="Certification Directory Does Not Report a Value"];  2:[user enter numeric value, xx.x; **and**  **check** value must be ≥ value in C05 to comply];  **else** flag non-compliant value and do not allow registration to proceed>> | << **if** value in C06=N/A, then result=NA;  **else** user input, numeric, xx.x;  **and** for all systems except for those with a value in [D04 or D05]= one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  **check** value must be ≥ value in C06, to comply;  **else** flag non-compliant value and do not allow registration to proceed>> | << if value in C07=N/A, then result=NA;  else user input, numeric, xx.x;  and for all systems except for those with a value in [D04 or D05]= one of the following three:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP-Ducted+Ductless,  **check** value must be ≥ value in C07, to comply;  **else** flag non-compliant value and do not allow registration to proceed>> | <<user input, numeric, xxxxxx>> | <<user input, numeric, x.x>> |
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| **K. Altered Space Conditioning System Duct Information (<75% of duct system is altered; or duct system is not altered)**  <<**if** section E does not apply, then display the section does not apply message;  **elseif** section E applies,  **then** for each SC System in Section E for which E03 = yes, **and** the alteration type value in column E09 is equal to one of the following two: 1:**[**Extension of Existing Duct System**]**, 2:**[**Altered Space Conditioning System**]**,  **do** the following actions: A, B, C, D, E, F, G:  **A**: require one row of data in this table for each space conditioning system in section F field F02 for which D04=Packaged Gas Furnace.  **B**: for each system where D04=central gas furnace, IF [the value in F03 ≠ H03] THEN require one row of data in this table for each indoor unit in section F field F03 ELSE IF no corresponding records exist in F03 or H03 AND a corresponding record exists in G01 THEN require one row of data in this table for that system;  **C**: require one row of data in this table for each space conditioning system in section G field G02 that meets both of the following two conditions: 1:[value in D05=central packaged AC, or central large packaged AC], 2:[the same packaged unit is not already listed in section F thus F02≠G02];  **D**: require one row in this table for each space conditioning system in Section I field I02 that meets both of the following two conditions: 1:[value in D05=central packaged HP, or central large packaged HP], 2:[the same packaged unit is not already listed in section F thus F02≠I02];  **E:** require one row of data in this table for each of the indoor units in F03 for which the value in F05 = one of the following two values [\*Ducted>10ft length; \*Ducted ≤10ft length]  **F:** require one row of data in this table for each of the indoor units in H03 for which H05= one of the following 2 values: [\*Ducted >10ft length; \*Ducted ≤10ft length];  **G**: If D11=existing, and D13 is ≥1, enter 1 row of data in this table for each of the quantity of ducted indoor units specified in D13. | | | | | | | | | | | |
| 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 | 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) |
| <<reference value from D01>> | <<reference value from D02>> | << **if** system type in D04=[Packaged Gas Furnace],  **then** value auto filled from D02,  **elseif** system type in [D04 or D05] = one of the following four types:  1: central packaged AC;  2: central packaged HP;  3: central large packaged AC ;  4: central large packaged HP  **then** value auto filled from D02,  elseif value in D06=1,  then value autofilled from D02;  else user input, text, 15 characters maximum;  do not allow duplicates in this dwelling>> | <<if E06=yes,  then allow user to pick one of the following values:  \*Both Supply and Return;  \*Supply only;  \*Return only;  else user pick one of the following values:  \*Both Supply and Return  \*Supply only  \*Return only  \*No>> | <<**if** K04=no,  **then** value=n/a,  **elseif** E06=no,  **then** value = R-6,  **elseif** value in C10 is  > R-6 when A02= CZs: 1-10, 12, 13  **or**  > R-8 when A02= CZs: 11, 14-16,  **then** display value from C10;  **elseif** A02= CZ 1-10, 12, 13,  **then** value = R-6.;  **elseif** A02=CZ 11, 14-16  **then** value = R-8;  end>> | <<**if** K04=\*no or \*Return only, **then** value=n/a;  elseif K04=\*Supply only or \*Both Supply and Return, then require user to pick one from the following list:  \* conditioned space-entirely,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors>> | <<if K04=\*no or \*Return only,  then value=n/a;  elseif K04=\*Supply only or \*Both Supply and Return, then require user to pick one value from the following list:  R-4.2  R-6,  R-8,  R-10,  R-12;  **check value**:  must be ≥ value in K05 to comply subject to the following exception:  **if** K10=  \*Ducts ≥R4.2 entirely in Conditioned Space,  **then** R-4.2 complies  flag non-compliant value and report in project status notes field; a revised CF1R or revised installation may be required>> | <<if K04=\*no or \*Supply only,  then value=n/a;  elseif K04=\*Return only or \*Both Supply and Return, then require user to pick one from the following list:  \* conditioned space-entirely,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors>> | << if K04=\*no or \*Supply only,  then value=n/a;  Elseif K04=\*Return only or \*Both Supply and Return, then require user to pick one value from the following list:  \*R-4.2,  \*R-6,  \*R-8,  \*R-10,  \*R-12;  **check value:**  must be ≥ value in K05 to comply subject to the following exception:  if K10=  \*Ducts ≥R4.2 entirely in Conditioned Space,  then R-4.2 complies;  flag non-compliant values and do not allow registration to proceed if not in compliance>> | << **if** K04=no,  **then** value=n/a,  **else** default text value=No Exceptions;  allow user to override the default and select one or both of the following two values:  \*\*uninsulated ducts in wall cavity  \*\*uninsulated exposed ducts  in directly conditioned space;  **ALSO**  if value in both K06 and K08= conditioned space-entirely,  then also allow user to select the following value:  \*\*Ducts ≥R4.2 entirely in conditioned space>> | << **if** system type in D04 or D05 is one of the following system types:  \*multisplit HP-ducted  \*multisplit HP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ducted+ductless  **then** value=no,  **elseif** system type in D04 or D05 is one of the following system types:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC  \*central large packaged HP,  **then** value=Yes,  **else** user pick one of the following two values from list:  \*\*yes  \*\*no  **check**:  if value=no,  then report in project status notes field that exemption from mandatory HERS verification of system airflow has been claimed. Enforcement agency confirmation is recommended.>> | <<**if** the following three conditions (A, B, C) are ALL true:  condition A:[D06 > 1],  condition B:[system type in D04=one of the following two values:  {VCHP-Ducted},  {VCHP -Ducted+Ductless}]  condition C:[one of the following two conditions (1, 2) is true:  **1:**{system is listed in section H (in H02); and H05= one of the following two values:  \*Ducted >10ft length  \*Ducted ≤10ft length},  **2:**{D11=existing, and D13 is ≥1}]  **then**  user input numeric value, x.xx,  **else** value=N/A |
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| Notes: | | | | | | | | | | | |

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| **L. Installed New or Complete Replacement Duct System Information**  <<**if** all of the SC Systems listed in Section D have a Distribution System Type value in D07 =DuctsNone , **then** display the section does not apply message;  **elseif** the following two conditions are **both** true: 1:**[**there are no systems for which D12=new**]**, 2:**[**section E applies, and there are no systems for which E07=yes**]**, **then** display the section does not apply message;  **else** for all systems that meet **one** of the following two conditions: 1:[D12=new]; 2[Section E applies, and E07=yes],  **do** the following actions, A, B, C, D, E, F, G:  **A**: require one row of data in this table for each space conditioning system in section F field F02 for which D04=Packaged Gas Furnace.  **B**: for each system where D04=central gas furnace, IF [the value in F03 ≠ H03] THEN require one row of data in this table for each indoor unit in section F field F03 ELSE IF no corresponding records exist in F03 or H03 AND a corresponding record exists in G01 THEN require one row of data in this table for that system;  **C**: require one row of data in this table for each space conditioning system in section G field G02 that meets both of the following two conditions: 1:[value in D05=central packaged AC, or central large packaged AC], 2:[the same packaged unit is not already listed in section F thus F02≠G02];  **D**: require one row in this table for each space conditioning system in Section I field I02 that meets both of the following two conditions: 1:[value in D05=central packaged HP, or central large packaged HP], 2:[the same packaged unit is not already listed in section F thus F02≠I02];**E:** enter one row of data in this table for each of the indoor units in F03 for which the value in F05 = one of the following two values [\*Ducted>10ft length; \*Ducted ≤10ft length]  **F:** enter one row of data in this table for each of the indoor units in H03 for which H05= one of the following 2 values: [\*Ducted >10ft length; \*Ducted ≤10ft length];  G: If D11=existing, and D13 is ≥1, enter 1 row of data in this table for each of the quantity of ducted indoor units specified in D13. | | | | | | | | | | | | | | |
| 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 | Total Duct Length | Required New Duct  R-Value | 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) |
| <<auto filled D01>> | <<auto filled from D02>> | <<**if** system type in D04=[Packaged Gas Furnace],  **then** value auto filled from D02,  **elseif** system type in [D04 or D05] = one of the following four types:  1: central packaged AC ;  2: central packaged HP;  3: central large packaged AC ;  4: central large packaged HP  **then** value auto filled from D02,  else reference applicable values from F03 and H03; | <<for indoor units listed in Section F,  **if** F05=  \*Ducted>10ft length,  **then** text value is: >10ft  **elseif** F05=  \*Ducted ≤10ft length  **then** text value = ≤10ft  **ALSO** for indoor units listed in Section H,  **if** H05=  \*Ducted>10ft length,  **then** text value is: >10ft  **elseif** H05=  \*Ducted ≤10ft length  **then** text value is: ≤10ft  **ALSO** for indoor units not listed in either Section F or Section H,  user pick one text value from the following 2:  \*[>10ft]  \*[≤10ft]>> | <<calculated field:  **if** value in C10 is  > R-6 for CZs: 1-10, 12, 13  **or**  > R-8 for CZs: 11, 14-16,  **then** display value from C10;  **elseif** A02= CZ 1-10, 12, 13,  **then** value = R-6.;  **elseif** A02=CZ 11, 14-16  **then** value = R-8;>> | <<if value in D07=  [Multiple split Indoor Units combined Ducted and Ductless]  then pick one value from list below,  else reference value from D07 as default. Allow user to overwrite only the following default values from D07:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor;**  If overriding pick one from list:  \*conditioned space-entirely,  \*conditioned space -except 12ft,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors  \*Ducts located in multiple places  \*Verified low-leakage ducts entirely in conditioned space  flag non-default values and report in project status notes field; a revised CF1R may be required >> | << calculated field:  if C10 =Verified Duct System Design,  then display text:  Verified  Duct  System  Design;  else user pick from list:  \*R-4.2,  \*R-6,  \*R-8,  \*R-10,  \*R-12;  and check value: must be ≥ value in L05to comply subject to the following exceptions:  if D07= \*LowLlCod - Verified low-leakage ducts in conditioned space,  then R-4.2 complies;  elseif J08=  \*Ducts ≥R4.2 entirely in Conditioned Space,  then R-4.2 complies;  else flag non-compliant value and do not allow registration to proceed >> | <<if value in D07=  [Multiple split Indoor Units combined Ducted and Ductless]  then pick one value from list below,  else reference value from D07 as default. Allow user to overwrite only the following default values from D07:  **\*DuctsAttic**  **\*DuctsGarage**  **\*DuctsOutdoor;**  If overriding pick one from list:  \*conditioned space-entirely,  \*conditioned space -except 12ft,  \*unconditioned attic,  \*unconditioned crawl space,  \*controlled ventilation crawl space  \*unconditioned garage,  \*unconditioned basement,  \*outdoors  \*Ducts located in multiple places  Verified low-leakage ducts entirely in conditioned space  flag non-default values and report in project status notes field; a revised CF1R may be required >> | <<calculated field:  if C10 =Verified Duct System Design,  then display text:  Verified  Duct  System  Design;  else user pick from list:  \*R-4.2,  \*R-6,  \*R-8,  \*R-10,  \*R-12;  and check value: must be ≥ value in L05,  to comply subject to the following exceptions:  if D07= \*LowLlCod - Verified low-leakage ducts in conditioned space,  then R-4.2 complies;  elseif J08=  \*Ducts ≥R4.2 entirely in Conditioned Space,  then R-4.2 complies;  else flag non-compliant value and do not allow registration to proceed >> | << Default Value=No Exceptions;  allow user to override the default and select **one or mor**e of the following two values:  \*uninsulated ducts in wall cavity  \*Uninsulated exposed ducts  in directly conditioned space;  **ALSO**  **if** values in both L06 and L08= conditioned space-entirely  **then** also allow user to select the following value:  \*Ducts ≥R4.2 entirely in conditioned space | << **if** System Type in D05=no cooling,  **then** result = Exempt - No Cooling  **elseif** D04 or D05=one of the following five system types:  \*evaporative - direct,  \*evaporative - indirect,  \*evaporative - indirectdirect,  \*VCHP-Ducted  \*VCHP-Ducted+Ductless  **then** text value = Exempt System Type;  **elseif** L13=no, **then** text value = Exempt - RA3.3 Protocols are N/A;  **elseif** B12={new, or altered}, **AND** one or more of the following seven (7) conditions is true:  (1)value in C09 < 0.58 or and D04≠ one of the following two:  \*\*central gas furnace  \*\*Packaged gas furnace  (2)value in C09 < 0.62 and D05 = one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  (3)value in C09 < 0.45 and  D04 = one of the following three:  \*\*central gas furnace  \*\*Packaged gas furnace  (4)value in C08 > 350 and D05 ≠ one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  (5)value in C08 > 250 and D05 = one of the following two:  \*\*small duct high velocity HP  \*\*small duct high velocity AC  (6)D09=Zonally Controlled  (7) either of F04 or H06= yes (is CFI Vent Sys)  **then** result=HERS Verified Fan Efficacy and Airflow Rate;  **elseif** CF1R-PRF indicates HERS verification=required  **then** user select one from list:  \*\*HERS Verified Fan Efficacy and Airflow Rate;  \*\*HERS verified Return Duct Design per Table 150.0-C, D>> | <<user enter integer value>>  note: this value will determine number or rows per indoor unit in next section | << **if** system type in D04 or D05 is one of the following system types:  \*multisplit HP-ducted  \*multisplit HP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ducted+ductless  **then** value=no,  **if** system type in D04 or D05 is one of the following system types:  \*central split AC;  \*central split HP;  \*central packaged AC;  \*central packaged HP;  \*central large packaged AC;  \*central large packaged HP;  then value=Yes,  **else** user pick one of the following two values from list:  \*\*yes  \*\*no  **check**:  **if** value=no,  **then** report in project status notes field that exemption from mandatory HERS verification of system airflow has been claimed. Enforcement agency confirmation is recommended  **also** report in project status notes field that better than minimum SEER or EER cannot not be claimed for performance compliance credit if the system cannot comply with the required HERS verification;  a revised CF1R may be required>> | <<**if** D04 or D05 = one of the following two types:  1:[VCHP-Ducted]  2:[VCHP-Ducted+Ductless]  **then** text value=[Exempt System Type]  **elseif** system type in D04 or D05 is one of the following system types:  \*multisplit HP-ducted  \*multisplit HP-ducted+ductless  \*multisplit AC-ducted  \*multisplit AC-ducted+ductless  **then** value=no,  **elseif** system type in D04 or D05 is one of the following six system types:  \*central split AC;  \*central split HP;  \*central packaged AC;  \*central packaged HP;  \*central large packaged AC;  \*central large packaged HP;  **then** value=Yes,  **else** user pick one of the following two values from list:  \*\*yes  \*\*no,  **check**:  **if** value=no,  **then** report in project status notes field that exemption from mandatory HERS verification of system fan efficacy has been claimed. Enforcement agency confirmation is recommended,  **also** report in project status notes field that better than minimum SEER or EER cannot be claimed for performance compliance credit if the system cannot comply with the required HERS verification;  a revised CF1R may be required>> | <<if the following three conditions (A, B, C) are ALL true:  condition A:[D06 > 1],  condition B:[system type in D04=one of the following two values:  {VCHP-Ducted},  {VCHP -Ducted+Ductless}]  condition C:[one of the following two conditions (1, 2) is true:  **1:**{system is listed in section H (in H02); and H05= one of the following two values:  \*Ducted >10ft length  \*Ducted ≤10ft length},  **2:**{D11=existing, and D13 is ≥1}]  then  user input numeric value, x.xx,  else value=N/A |
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| **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 the filter grille displaying the filter grille/rack design airflow rate 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.  <<**if** all of the SC Systems listed in Section D have a Distribution System Type value in D07 =DuctsNone (Air distribution systems without ducts), **then** display the section does not apply message;  **elseif** there are no duct systems in section L for which L04=[>10ft]  **then** display the section does not apply message;  **else** require one row of data (each) for the quantity of air filter devices in L12 for each of the duct systems in section L (L03) for which L04=[>10ft]>> | | | | | | | | | | | | |
| 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 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  (inch2) | Air Filter Required  Minimum Face Area  (inch2) | Face Area Compliance | Design Allowable Pressure Drop for Air Filter Device  (inch W.C.) |
| <<auto filled from D01>> | <<auto filled from D02>> | <<auto filled from L03 | <<user input text, maximum 20 characters>> | <<user select from list:  \*Filter Grille  \*Furnace Mounted  \*Duct Mounted  >> | <<user enter numeric, xxxx>> | <<user enter integer value ≥1.00  >> | <<user enter integer value ≥1.00  >> | <<user enter integer value ≥1.00>> | <<calculated numeric value= (M08\*M09)>> | <<**if** M07=1,  **then** calculated value=(M06 ÷ 150) \* 144,  **elseif** system type value in either D04 or D05= one of the following two:  \*VCHP Indoor Units -Ducted, \*VCHP Indoor Units-Ducted+Ductless,  **then** value = (M06 ÷ 150) \* 144;  **else** display text: "specified by system designer" | <<**if** value in M11= "specified by system designer",  **then** display text: "specified by system designer";  **elseif** M10≥M11,  **then** display text: "complies",  **else** display text:"does not comply">> | << **if** system type value in either D04 or D05= one of the following two:  \*VCHP Indoor Units - Ducted, \*VCHP Indoor Units Ducted+Ductless,  **then** value = 0.1,  **elseif** value in M07=1,  **then** value = 0.1;  **else** user enter value, numeric, x.xx>> |
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| **N. Air Filter Device Requirements**  <<if Section M. applies, then display Section N.; else display section header and the section does not apply message>> | |
| 01 | The system shall be designed to ensure that all recirculated air and all outdoor air supplied to the occupiable space is filtered before passing through the system's thermal conditioning components. |
| 02 | The 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. |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | |

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| **O. HERS Verification Requirements for Duct Systems**  <<**if** both Sections K and L do not apply, then display the section does not apply message, **else** require one row of data in this table for each of the indoor units listed in L03;  **also** require one row of data in this table for each of the indoor units listed in K03>> | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|  |  |  |  | MCH-20 | MCH-21 | MCH-22 | MCH-23 | MCH-28 | MCH-29 | MCH30 |
| 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 | Duct Leakage Test | Duct Location Verification | AHU Fan Efficacy (W/cfm) | AHU Airflow Rate  (cfm/ton) | Return Duct Design - Table 150.0-B or C | Supply Duct Surface Area R-Value Buried Ducts | Central Fan Ventilation Cooling Credit |
| <<auto filled from D01>> | <<auto filled from D02>> | <<autofilled; reference values from K03 and L03 as applicable>> | <<calculated value:  default text value = No Exemptions;  Allow user to override the default and pick one of the following three values from list:  \* Ducts have previously been sealed, tested, and certified by a HERS Rater;  \* Duct system has less than 40 ft of duct;  \* Duct system is insulated or sealed with asbestos;  Flag non-default values and report in project status notes field; The enforcement agency may require additional documentation as validation>> | <<Calculated field:  if O04 ≠ No Exemptions,  then value = no;  elseif D04 or D05 = VCHPDucted  or VCHP-Ducted+Ductless AND D11 = new, then result = yes;  elseif the CF1R flags the requirement for HERS verification of duct leakage for the system ID/Name in O01; then value=yes;  elseif Section E applies,  then determine the result for this field by the user responses in E03, E04, E05 , E06, E07, E08, and use of Logic Table (inserted below section E); constrain user input for fields E03-E08 to allow only the available combinations of responses given in the Logic Table in rows a through t, and determine result for this field as follows:  If the term "DctLk" appears in  the HERS column, then display  result=yes  else result=no>> | << Calculated field:  **if** the applicable value in either K10 or L10=  \*Ducts ≥R4.2 entirely in conditioned space,  **and** one of the following two conditions is true:  1] applicable values in either L07 or L09 are <L05  2] applicable values in either K07 or K09 are  < K05,  **then** display result in this field=yes;  **elseif** applicable values in either K10 or L10= one of the following two:  \*uninsulated ducts in wall cavity  \*Uninsulated exposed ducts  in directly conditioned space,  **then** result=yes  Elseif value in D07= one of the following:  \*DuctsInEx12; \*DuctsInAll;  then display result in this field=yes;  else display result=no>> | <<calculated field:  **if** L14=Exempt System Type,  **then** result=no  **elseif** L11 result is Fan Efficacy and Airflow Rate,  **then** result=yes,  **elseif** either F04 or H06 = yes (CFI IAQ ventilation),  **then** result= yes;  **else** result=no>> | <<calculated field:  if the value in K11 or L13=no, then result ="no";  **elseif** D04 or D05 = one of the following two system types:  \*VCHP-Ducted  \*VCHP-Ducted+Ductless  **then** result=yes;  **elseif** L11 result is Fan Efficacy, and Airflow Rate,  **then** result = yes;  **elseif** P03=yes, and value in O09=no,  **then** value in this field=yes;  **elseif** either F04 or H06 = yes (CFI IAQ ventilation), then result= yes;  else result=no>> | <<calculated field:  **if** L11 result is Return Duct Design per Table 150.0-C, D, **then** result=yes;  **else** result=no>> | <<calculated field:  if D04 or D05 = VCHP-Ducted or VCHPDucted+  Ductless AND D11 = new, then result = no;  **Elseif** the CF1R flags the requirement for HERS verified duct design (Supply Duct Surface Area R-Value or Buried Ducts,  **then** result=yes;  **else** result=no>> | << calculated field:  **if** B05 = one of the following two values:  \*variable flow  \*fixed flow  **then** result=yes,  **elseif** B05=N/A,  then result=no>> |
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| **P. HERS Verification Requirements for Space Conditioning Equipment**  <<require one row of data in this table for each of the SC Systems listed in G01 and in I01;  **==>>ALSO** if section E applies, enter one row of data in this table for SC Systems for which D11 = Existing, and E04=yes>> | | | | |
| 01 | 02 | 03 | 04 |  |
|  |  | MCH-25 | MCH-26 | MCH-33 |
| SC System ID/Name from CF1R | SC System Description of Area Served | Refrigerant Charge | Rated  SC System  Equipment Verification | VCHP Compliance Credit |
| <<auto filled from D01>> | <<auto filled from D02>> | <<Calculated field:  **if** B11 = one of the following two values: \*New  \*Altered,  **and** the CF1R reports verification of RC = Required,  **then** result = Yes;  **elseif** the CF1R reports verification of RC = Not Required,  **then** result = No;  **elseif** Section E applies, and the following two conditions are true: 1:[D11 = Existing] 2:[E04 = Yes],  **then** result = Yes;  **else** result = No>> | <<if P01 is one of the HP systems listed in I01,  then result = yes;  **elseif** B03 or B04=one of the following three system types:  \*ductless mini-split AC  \*ductless VRF AC;  \*ductless multi-split AC  \*ducted mini-split AC  **then** result=no  elseif B04={Small Duct High Velocity AC system},  and C06 > 12,  then result=yes.  **elseif** **both** of the following two criteria are true: 1: [C06≠N/A]; 2: [C06 > 14];  **then** result=yes;  **elseif** the following three conditions are true**:**  **1:** [B04 = {central packaged AC}],  **2**:[C07≠N/A];  **3**:[C07 > 11.0];  **then** result = yes;  **elseif** B04 = "central split AC" **and** **all** of the following three criteria are true: 1:[C07≠N/A]; 2:[C07 > 11.7]; 3:[G10 ≥ 45000];  **then** result=yes;  **elseif** B04 = "central split AC" **and** **all of** the following three criteria are true: 1:[C07≠N/A]; 2:[C07 > 12.2]; 3:[G10 < 45000];  **then** result=yes;  else result=no>> | <<**if** D04 or D05=one of the following three system types:  \*VCHP-Ducted  \*VCHP-Ductless  \*VCHP -Ducted+Ductless  **then** result in this field=yes,  **else** result in this field=no>> |
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| Notes: | | | | |

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| **Q. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures**  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(b). | |
| 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)2 and 3, and Section 150.0(m)9. | |
| 08 | | Condensing Unit Location: Condensing units shall not be placed within five (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. | |
| **Air Distribution System Ducts, Plenums and Fans** | | | |
| 11 | | Insulation: The minimum duct insulation value is R-6. Note that higher values may be required by the prescriptive or performance requirements. See Section 150.0(m)1. | |
| 12 | | Connections and Closures: 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: Supply-air and return-air ducts and plenums must be insulated to a minimum installed level of R-6.0 otherwise a minimum of R-4.2 is allowed if the system is enclosed entirely in conditioned space as confirmed through field verification and diagnostic testing in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.8. Exceptions for ducts in interior wall cavities or exposed ducts entirely in conditioned space are specified in Section 150.0(m)1B. | |
| **Heat Pump Thermostat** | | | |
| 13 | | A thermostat shall be installed that meets the requirements of Section 110.2(b) and Section 110.2(c). | |
| 14 | | The thermostat shall be installed in accordance with the manufacturers published installation specifications. | |
| 15 | | First stage of heating shall be assigned to heat pump heating. | |
| 16 | | Second stage back up heating shall be set to come on only when the indoor set temperature cannot be met. | |
| **The responsible person’s signature on this compliance document affirms that all applicable requirements in this table have been met.** | | | |