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| **A. General Information**  CF1R-ALT-02 is applicable to multiple space conditioning systems contained within a single dwelling unit. When multiple dwelling units must be documented, use one CF1R-ALT-02 document for each dwelling unit. | | | | | |
| 01 | Project Name: |  | 02 | Date Prepared: |  |
| 03 | Project Location: |  | 04 | Building Type: |  |
| 05 | CA City: |  | 06 | Dwelling Unit Name: |  |
| 07 | Zip Code: |  | 08 | Dwelling Unit CFA (ft2): |  |
| 09 | Climate Zone: |  | 10 | Number of Space Conditioning (SC) Systems in this Dwelling Unit: |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **B. Space Conditioning (SC) System Information** | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name | SC System  Description of Area Served | CFA served by this SC System (ft2): | Is the SC system a ducted system? | Installing a refrigerant containing component? | Installing new SC system components? | Installing more than 40 feet of ducts? | Installing entirely new duct system? | Installing entirely new SC system? | Alteration Type: |
|  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- |
| **C. Extension of Existing Duct System, Greater Than 40 Feet (Section 150.2(b)1Diib)** | | | |
| 01 | 02 | 03 |  |
| SC System ID/Name | SC System  Description of Area Served | Required  New Duct  R-Value |  |
|  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16).  CF2R & CF3R-MCH-20-H – Duct Leakage Test  -Leakage rate compliance: ≤ 15%, or ≤ 10% leakage to outside, or seal all accessible leaks  Exceptions:  Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 duct leakage testing requirements | | | |

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| **D. Altered Space Conditioning System (Sections 150.2(b)1E and F)** | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 |
| SC System ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New or Replaced Duct Length | New Duct  R-Value |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H – Duct Leakage Test required when heating or cooling components are installed in ducted systems, or when more than 40 ft of duct length is replaced.  -Leakage rate compliance: ≤ 15%, or ≤ 10% leakage to outside, or seal all accessible leaks.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  CF2R & CF3R-MCH-23 Airflow Rate ≥ 300 CFM/ton required when MCH-25 is required.  Exceptions:  -Duct systems registered with HERS provider as previously sealed are exempt from MCH-20 Duct Leakage Testing requirements.  -Heating-only systems and Air Handler/Furnace changes do not require verification of Air Flow MCH-23, or Refrigerant Charge MCH-25.  -Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 Duct Leakage Testing requirements. | | | | | | | | | | | | |

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| **E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)** | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System Identification or ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling  Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New Duct  R-Value |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H Duct Leakage Test required.  -Leakage rate compliance: ≤ 5%.  CF2R & CF3R-MCH-22 Fan Efficacy  CF2R & CF3R-MCH-23 Airflow Rate  -Compliance: Fan Efficacy ≤ 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow ≥ 350 cfm/ton.  -Alternative Compliance: CF2R & CF3R-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  Exceptions:  Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.  Note:  An "entirely new or complete replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage | | | | | | | | | | | |

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| **F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)** | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New Duct  R-Value |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H Duct Leakage Test required.  -Leakage rate compliance: ≤ 5%.  CF2R & CF3R-MCH-22 Fan Efficacy  CF2R & CF3R-MCH-23 Airflow Rate  -Compliance: Fan Efficacy ≤ 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow ≥ 350 cfm/ton.  - Alternative Compliance: CF2R & CF3R-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  Exceptions:  Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.  Note:  An "entirely new or complete replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage | | | | | | | | | | | |

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| **Documentation Author's Declaration Statement** | |
| 1. I certify that this Certificate of Compliance documentation is accurate and complete. | |
| Documentation Author Name: | Documentation Author Signature: |
| Company: | Signature Date: |
| Address: | CEA/HERS Certification Identification (if applicable): |
| City/State/Zip: | Phone: |
| **Responsible Person's Declaration statement** | |
| I certify the following under penalty of perjury, under the laws of the State of California:   1. The information provided on this Certificate of Compliance is true and correct. 2. I am eligible under Division 3 of the Business and Professions Code to accept responsibility for the building design or system design identified on this Certificate of Compliance (responsible designer). 3. That the energy features and performance specifications, materials, components, and manufactured devices for the building design or system design identified on this Certificate of Compliance conform to the requirements of Title 24, Part 1 and Part 6 of the California Code of Regulations. 4. The building design features or system design features identified on this Certificate of Compliance are consistent with the information provided on other applicable compliance documents, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application. 5. I will ensure that a registered copy of this Certificate of Compliance shall be made available with the building permit(s) issued for the building, and made available to the enforcement agency for all applicable inspections. I understand that a registered copy of this Certificate of Compliance is required to be included with the documentation the builder provides to the building owner at occupancy. | |
| Responsible Designer Name: | Responsible Designer Signature: |
| Company: | Date Signed: |
| Address: | License: |
| City/State/Zip: | Phone: |

**CF1R-ALT-02-E User Instructions**

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

Completing these forms will require that you have the 2016 Reference Appendices for the 2016 Building Energy Efficiency Standards.

When the term CF1R is used, it is referencing the CF1R-ALT-02. Worksheets are identified by their entire name, and subsequently by only the worksheet number, such as CF1R-ENV-02.

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

If any part of the alteration does not comply with the prescriptive requirements, prescriptive compliance fails and the performance compliance approach must be used.

**A. General Information**

1. Project Name: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter a unique project identifier such as the house number and street name or example: “Jones’ Furnace Change out.”
2. Date Prepared: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter the date of document preparation.
3. Project Location: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter the legal street address of property or other applicable identifying information.
4. Building Type: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter the building type from the list: Single Family (includes duplex), or Multi-family (a building that shares common walls and common floors or ceilings).
5. CA City: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter the legal city/town of property.
6. Dwelling Unit Name: Enter a unique dwelling unit name or any other identifying name that would readily distinguish this dwelling unit from others in this project. Primarily needed for multi-family dwellings. For one-dwelling projects, use project name or another logical identifier.
7. Zip Code: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, enter the 5-digit zip code for the project location (used to determine climate zone).
8. Dwelling Unit CFA (ft2): If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. For one-dwelling projects, this field will equal the conditioned floor area (CFA) on that document. For multi-dwelling projects, this field will sum with other dwelling units to equal the total CFA on that document. If this project does not utilize a CF1R-ALT-01 (or CF1R-ADD-01), enter the conditioned floor area in ft2 of the project. If multiple systems are being affected, a CFA value will be assigned to each system in Section B. Those must sum to this total for the project. For projects NOT involving all systems in the dwelling, this is the CFA of only the portion of the dwelling unit affected.
9. Climate Zone: If the project utilizes a CF1R-ALT-01 (or CF1R-ADD-01), this field will reference the same field on that document for consistency. If not, select the correct climate zone for the project. From Joint Appendix JA2.1.1 of the 2016 Reference Appendices.
10. Number of Space Conditioning (SC) Systems in this Dwelling Unit: Enter the number of space conditioning systems in the dwelling unit.

**B. Space Conditioning (SC) System Information (Section 150.2(b)1C)**

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. CFA served by this SC System (ft2): Enter the CFA served by this system.
4. 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.
5. 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.
6. 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**.”
7. Installing more than 40 linear feet of new or replacement ducts? Select “**YES**” if the project involves installing more than 40 linear feet of new or replacement ducts; otherwise select “**NO**.”
8. Is the entire duct system accessible for sealing and is more than 75% of the duct system new or replaced? Select “**YES**” when, upon completion of the project, more than 75% of the ducts will be new ducts and/or replaced ducts, AND if at any time during the project all of the ducts are accessible for duct sealing; otherwise select “**NO**.” “Accessible” is defined in Joint Appendix JA1 of the 2016 Reference Appendices (glossary).
9. 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**.”
10. 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 2016 Reference Appendices. The alteration type will determine which of the following sections are required by this document.

**C. Extension of Existing Duct System, Greater Than 40 Feet (Section 150.2(b)1Diib)**

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Required New Duct R-value: This field is automatically calculated based on the climate zone selected in Section A. It represents the minimum R-value required. The installed R-value shown on the installation certificate (CF2R) must meet or exceed this value.

**D. Altered Space Conditioning System (Sections 150.2(b)1E and F)**

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: Select the most appropriate heating system components from the list that are being added or replaced as part of this project. You can select multiple choices if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.
6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum efficiency value.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components: User chooses as many as are applicable: Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements of Section 150.0(i) is required to be installed as part of this project.
12. New or Replaced Duct Length: Select the descriptor that describes the amount of duct, at the completion of the project that is added or replaced as part of this project.
13. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

**E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)**

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B.
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: Select the most appropriate heating system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.
6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components: User chooses as many as that are applicable: Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements is required to be installed as part of this project.
12. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

**F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)**

1. System Identification or Name: This field is automatically filled from entries in Section B.
2. SC System Location or Description of Area Served. This field is automatically filled from entries in Section B
3. Heating System Type: Select the most appropriate heating system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
4. Altered Heating Component: This field is automatically filled.
5. Heating Efficiency Type: Select the heating efficiency type from the list that is appropriate to the type of system being altered or installed.
6. Heating Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
7. Cooling System Type: Select the most appropriate cooling system type from the list. If the type of system to be installed does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
8. Altered Cooling Components (user chooses as many as that are applicable): Select the most appropriate cooling system components from the list that are being added or replaced as part of this project. You can select multiple choices, if needed. If the type of component being altered does not appear on the list, please contact the California Energy Commission Hotline at 800-772-3300.
9. Cooling Efficiency Type: Select the cooling efficiency type from the list that is appropriate to the type of system being altered or installed.
10. Cooling Minimum Efficiency Value: This field is filled automatically based on selections in previous fields. This field represents the minimum efficiency to be installed. The actual installed efficiency may be higher and will be recorded on the Installation Certificate (CF2R). Optional: the user may enter a higher-than-default value for situations where local codes or programs require a higher minimum.
11. Required Thermostat Type: This field is filled automatically based on selections in previous fields. If “setback” appears here, a setback thermostat meeting the minimum requirements is required to be installed as part of this project.
12. New Duct R-value: This field is filled automatically based on the entries in previous fields and the climate zone of the project.

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| **A. General Information**  CF1R-ALT-02 is applicable to multiple space conditioning systems contained within a single dwelling unit. When multiple dwelling units must be documented, use one CF1R-ALT-02 document for each dwelling unit. | | | | | |
| 01 | Project Name: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text>> | 02 | Date Prepared: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input date format; pick from enumerated list>> |
| 03 | Project Location: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text: Street address or alternate applicable description of location >> | 04 | Building Type: | < reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user select one from list:  \*Single Family;  \* Multi Family>> |
| 05 | CA City: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text: a city name>> | 06 | Dwelling Unit Name: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text>> |
| 07 | Zip Code: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text: pick from enumerated list>> | 08 | Dwelling Unit CFA (ft2) | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input integer; xxxxx; >> |
| 09 | Climate Zone: | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input text: pick from enumerated list>> | 10 | Number of space conditioning (SC) systems in this dwelling unit. | << reference from CF1R-ALT-01, or CF1R-ADD-01 if applicable, else user input: integer, xx>> |

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| **B. Space Conditioning (SC) System Information**  << require one row of data to be entered in this table for each of the quantity of space conditioning systems entered in A10>> | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 |
| SC System ID/Name | SC System  Description of Area Served | CFA served by this SC System (ft2): | Is the SC system a ducted system? | Installing a refrigerant containing component? | Installing new SC system components? | Installing more than 40 feet of ducts? | Installing entirely new duct system? | Installing entirely new SC system? | Alteration Type: |
| <<user input: text, max 20 characters  do not allow duplicate system names to be used for this dwelling unit>> | <<user input: text, max 20 characters  do not allow duplicate descriptions to be used for this dwelling unit (for this MCH-01)>> | <<numeric; xxxx; require the sum of the CFA values entered in this column to be equal to the value for CFA entered in A08>> | user pick from list: "yes"; or "no">> | user pick from list: "yes"; or "no">> | user pick from list: "yes"; or "no">> | user pick from list: "yes"; or "no">> | 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 B04, B05 , B06, B07, B08, B09 and use of "Logic Table for Determining Alteration Type and HERS Verification Requirements" (inserted below this section); constrain user input for fields B04-B09 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 (Section C);  \*Altered Space Conditioning System (Section D);  \*Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E)  \*Entirely New or Complete Replacement Space Conditioning System (Section F)  \* No Alteration Performed >> |

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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 hydronic AHU 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 compinent + 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. new ductless hydronic heating system |
| **n** | no | yes | yes | no | no | yes | Entirely new space conditioning system | RC | e.g. new mini-split (weigh-in); or new room packeged 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 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 |
| Nomenclature:  RC = Refrigerant Charge Verification (MCH-25) applicable in CZ 2, 8-15  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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| **C. Extension of Existing Duct System, Greater Than 40 Feet (Section 150.2(b)1Diib)**  <<if there are no Alteration Types in column B10 equal to "Extension of Existing Duct System (Section C)" then display the "section does not apply" message, else require one row of data to be entered in this table for each SC System of alteration type in column B10 equal to: "Extension of Existing Duct System (Section C)" | | | |
| 01 | 02 | 03 |  |
| SC System ID/Name | SC System  Description of Area Served | Required  New Duct  R-Value |  |
| << auto filled from B01 >> | << auto filled from B02 >> | <<calculated field: if A09= CZ 1-10, 12, 13, then value = "R-6."; else if A09=CZ 11, 14-16 then value = "R-8." |  |
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| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16).  CF2R & CF3R-MCH-20-H – Duct Leakage Test  -Leakage rate compliance: ≤ 15%, or ≤ 10% leakage to outside, or seal all accessible leaks  Exceptions:  Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 duct leakage testing requirements | | | |

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| **D. Altered Space Conditioning System (Sections 150.2(b)1E and F)**  <<**if** there are no Alteration Types in column B10 equal to "Altered Space Conditioning System (Section D)" then display the "section does not apply" message; **else** require one row of data in this table for each SC System of alteration type in column B10 equal to: "Altered Space Conditioning System (Section D)">> | | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 |
| SC System ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New or Replaced Duct Length | New Duct  R-Value |
| <<auto filled from B01 >> | << auto filled from B02 >> | <<user pick one from list:  \*central gas furnace;  \*central split HP;  \*central packaged HP;  \*central large packaged HP;  \*ductless mini-split HP;  \*room 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;  \*non-air-source heat pump;  \*Wood Heat;  \* no heating;  \*Small duct high velocity HP;  \*Ductless VRF HP;  \*Packaged gas furnace  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*VCHP-ducted  \*VCHP-ductless  \*VCHP-ducted+ductless  \*ducted mini-split HP>> | << user pick as many as are applicable from list:  \*gas furnace AHU;  \*fancoil AHU;  \*outdoor condensing unit;  \*indoor coil;  \*boiler;  \*TXV or EXV;  \*compressor;  \*refrigerant lineset;  \*no heating component altered>> | << if D04= no heating component altered, then value =n/a,  else user pick from list:  \*AFUE; \*HSPF; \*COP>> | << if D04= no heating component altered, then value =n/a,  else user enter numeric value  xx.x;  default minimum value for AFUE=  0.80; or default minimum value for HSPF=  8.0; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | <<user pick one from list:  \*central split AC;  \*central split HP;  \*central packaged AC ;  \*central packaged HP;  \* central large packaged AC ;  \*central large packaged HP;  \*ductless mini-split AC;  \*ductless mini-split HP;  \*gas absorption AC;  \*room AC;  \*room HP;  \*hydronic HP;  \*hydronic HP+forced air  \*evaporative – direct;  \*evaporative – indirect;  \*evaporative – indirect/direct;  \*evaporatively cooled condenser;  \*Ice Storage AC;  \*non-air-source heat pump;  \*non-air-cooled air conditioner;  \*no cooling  \*Small duct high velocity HP;  \*Small duct high velocity AC;  \*Ductless VRF HP;  \*Ductless VRF AC;  \*multisplit AC-ducted  \*multisplit AC-ductless  \*multisplit AC-ducted+ductless  \*multisplit HP-ducted  \*multisplit HP-ductless  \*multisplit HP-ducted+ductless  \*VCHP-ducted  \*VCHP-ductless  \*VCHP-ducted+ductless  \*ducted mini-split AC  \*ducted mini-split HP >> | <<user pick as many as are applicable from list:  \*outdoor condensing unit;  \*indoor fancoil AHU;  \*indoor coil;  \*TXV or EXV;  \*Compressor;  \*refrigerant lineset;  \*no cooling component altered>> | << if D08= no cooling component altered, then value =n/a,  else user pick from list:  \*SEER;  \*EER>> | << if D08= no cooling component altered, then value =n/a,  else user enter value:  xx.x; default minimum value for SEER=14; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | << setback>> | << calculated field: if B04=no, then display N/A; else user pick from list:  \*≤40ft; \*>40ft; \*N/A-no ducts replaced>> | <<calculated field: if B04=no, then display N/A;  elseif D12=N/A, then display N/A;  elsif A09= CZ 1-10, 12, 13, then "R-6."; else if A09=CZ 11, 14-16 then "R-8." |
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| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H – Duct Leakage Test required when heating or cooling components are installed in ducted systems, or when more than 40 ft of duct length is replaced.  -Leakage rate compliance: ≤ 15%, or ≤ 10% leakage to outside, or seal all accessible leaks.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  CF2R & CF3R-MCH-23 Airflow Rate ≥ 300 CFM/ton required when MCH-25 is required.  Exceptions:  -Duct systems registered with HERS provider as previously sealed are exempt from MCH-20 Duct Leakage Testing requirements.  -Heating-only systems and Air Handler/Furnace changes do not require verification of Air Flow MCH-23, or Refrigerant Charge MCH-25.  -Existing duct systems constructed, insulated or sealed with asbestos are exempt from MCH-20 Duct Leakage Testing requirements. | | | | | | | | | | | | |

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| **E. Entirely New or Complete Replacement Duct System, with or without Equipment Changeout (Sections 150.2(b)1Diia and 150.2(b)1E, F)**  <<if there are no Alteration Types in column B10 equal to "Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E)" then display the "section does not apply" message; else require one row of data in this table for each SC System of alteration type in column B10 equal to: "Entirely New or Complete Replacement Duct System with or without Equipment Changeout (Section E)">> | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System Identification or ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling  Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New Duct  R-Value |
| << auto filled from B01 >> | << auto filled from B02 >> | <<user pick one from list:  \*central gas furnace;  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless split HP;  \*room 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  \* no heating;  \*Wood Heat;  \*Packaged gas furnace>> | << user pick as many as are applicable from list:  \*gas furnace AHU;  \*fancoil AHU;  \*outdoor condensing unit;  \*indoor coil;  \*boiler;  \*TXV or EXV;  \*compressor;  \*refrigerant lineset;  \*no heating component altered>> | <<if E04= no heating component altered, then value =n/a,  else user pick from list:  \*AFUE; \*HSPF; \*COP>> | << if E04= no heating component altered, then value =n/a,  elseuser enter value:  xx.x; default minimum value for AFUE=  0.80; or default minimum value for HSPF=  8.0; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | <<user pick one from list:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \* central large packaged AC ;  \*central large packaged HP  \*ductless split AC;  \*ductless split 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>> | <<user pick as many as are applicable from list:  \*outdoor condensing unit,  \*indoor fancoil AHU,  \*indoor coil,  \*TXV or EXV,  \*Compressor,  \*refrigerant lineset,  \*no cooling component altered>> | << if E08= no cooling component altered, then value =n/a,  else user pick from list: \*SEER;  \*EER>> | << if E08= no cooling component altered, then value =n/a else user enter value:  xx.x; default minimum value for SEER=14; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | <<setback>> | <<calculated field: if A09= CZ 1-10, 12, 13, then "R-6."; else if A09=CZ 11, 14-16 then "R-8." |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H Duct Leakage Test required.  -Leakage rate compliance: ≤ 5%.  CF2R & CF3R-MCH-22 Fan Efficacy  CF2R & CF3R-MCH-23 Airflow Rate  -Compliance: Fan Efficacy ≤ 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow ≥ 350 cfm/ton.  -Alternative Compliance: CF2R & CF3R-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  Exceptions:  Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.  Note:  An "entirely new or complete replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage | | | | | | | | | | | |

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| **F. Entirely New or Complete Replacement Space Conditioning System (Section 150.2(b)1C)**  <<if there are no Alteration Types in column B10 equal to "Entirely New or Complete Replacement Space Conditioning System (Section F)" then display the "section does not apply" message; else require one row of data in this table for each SC System of alteration type in column B10 equal to: "Entirely New or Complete Replacement Space Conditioning System (Section F)">> | | | | | | | | | | | |
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 |
| SC System ID/Name | SC System  Description of Area Served | Heating System Type | Altered  Heating Component | Heating Efficiency Type | Heating  Minimum Efficiency Value | Cooling System Type | Altered  Cooling Components | Cooling Efficiency Type | Cooling  Minimum Efficiency Value | Required Thermostat Type | New Duct  R-Value |
| << auto filled from B01 >> | << auto filled from B02 >> | <<user pick one from list:  \*central gas furnace;  \*central split HP;  \*central packaged HP  \*central large packaged HP  \*ductless split HP;  \*room HP;  \*boiler;  \*hydronic;  \*hydronic+forced air;  \*combined hydronic+forced air;  \*hydronic HP,  \*hydronic HP+forced air;  \*combined hydronic;  \*gas wall furnace;  \*gas space heater;  \*electric  \* no heating;  \*Wood Heat;  \*Packaged gas furnace>> | << calculated field:  **if** F03=N/A (no heating); **then** textvalue= no heating component altered;  **else** value=entirely new heating system>> | << if F04= no heating component altered, then value =n/a;  else user pick from list:  \*AFUE; \*HSPF; \*COP>> | <<if F04= no heating component altered, then value =n/a;  else user enter value:  xx.x; default minimum value for AFUE=  0.80; or default minimum value for HSPF=  8.0; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | <<user pick one from list:  \*central split AC;  \*central split HP  \*central packaged AC ;  \*central packaged HP  \*central large packaged AC ;  \*central large packaged HP  \*ductless split AC;  \*ductless split 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>> | << calculated field:  if F07=no cooling;  then value= no cooling component altered;  else value= entirely new cooling system>> | << **if** F08= no cooling component altered, **then** value =n/a,  **else** user pick from list:  \*SEER;  \*EER>> | << if F08= no cooling component altered, then value =n/a,  else user enter numeric value:  xx.x;  default minimum value for SEER=14; allow user to overwrite default value, but flag non-default values and report in project status notes field >> | < setback>> | <<calculated field:  **if** B04=no, then display text value= N/A;  **elsif** A09= CZ 1-10, 12, 13,  **then value=**  "R-6.";  **else** if A09=CZ 11, 14-16  **then** value=  "R-8." |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Required Documentation:  CF2R-MCH-01-E - Space Conditioning Systems  -Duct insulation requirement for the new portions of supply-air and return-air ducts or plenums: R6 (CZ 1-10, 12 & 13) and R-8 (CZ 11 & 14-16)  CF2R & CF3R-MCH-20-H Duct Leakage Test required.  -Leakage rate compliance: ≤ 5%.  CF2R & CF3R-MCH-22 Fan Efficacy  CF2R & CF3R-MCH-23 Airflow Rate  -Compliance: Fan Efficacy ≤ 0.58 W/cfm for non-gas furnaces and 0.45 W/cfm for gas furnaces and System Airflow ≥ 350 cfm/ton.  - Alternative Compliance: CF2R & CF3R-MCH-28 Return Duct Design verification is an alternative to MCH-22 and MCH-23 verification.  CF2R & CF3R-MCH-25-H Refrigerant Charge verification required when refrigerant containing components are installed or altered (applicable in CZ 2, 8-15).  Exceptions:  Heating-only systems are exempt from the 0.58 W/cfm and 350 cfm/ton requirements.  Note:  An "entirely new or replacement duct system" means at least 75 percent of the duct system is new duct material, and up to 25 percent may consist of reused parts from the dwelling unit's existing duct system (e.g., registers, grilles, boots, air handler, coil, plenums, duct material) if the reused parts are accessible and can be sealed to prevent leakage | | | | | | | | | | | |