

**DOCKETED**

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CERTIFICATE OF INSTALLATION		CF2R-MCH-01-E
Space Conditioning Systems, Ducts, and Fans		(Page 1 of 7)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

A. General Information					
01	Dwelling Unit Name		02	Climate Zone	
03	Dwelling Unit Total Conditioned Floor Area (ft <sup>2</sup> )		04	Number of Space Conditioning Systems in this Dwelling Unit	
05	Certificate of Compliance Type		06	Method Used to Calculate HVAC Loads	
07	Calculated Dwelling Unit Sensible Cooling Load (Btu/h)		08	Calculated Dwelling Unit Heating Load (Btu/h)	
09	Dwelling Unit Number of Bedrooms				

<b>MCH-01b - Space Conditioning Systems Ducts and Fans - Prescriptive Alterations</b>
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B. Space Conditioning (SC) System Information									
01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	CFA served by this SC System (ft <sup>2</sup> ):	Is the SC system a ducted system?	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
Notes:									



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C. Space Conditioning (SC) System Alterations Compliance 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	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	Number of Ducted Indoor Units Connected to the System's Outdoor Unit	Central Fan Integrated (CFI) Ventilation System Status
Notes:												

D. Installed Heating Equipment Information							
01	02	03	04	05	06	07	08
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)
Notes:							

E. Installed Cooling Equipment Information:								
01	02	03	04	05	06	07	08	09
SC Identification or Name	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency Value	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Capacity (ton)
Notes:								



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F. Extension of Existing Duct System, Greater Than 40 Feet			
01	02	03	04
SC Identification or Name	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	New Duct R-Value
Notes:			

G. Installed New or Complete Replacement Duct System 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	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	Exemption 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 RA3.3 Airflow Protocols be used to test this System?
Notes:												

H. Installed Air Filter Device Information												
Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near 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 (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
Notes:												



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I. 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 filter media having a designated efficiency equal to or greater than MERV 6 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 $\mu\text{m}$ range and equal to or greater than 85 percent in the 1.0-3.0 $\mu\text{m}$ range when tested in accordance with AHRI Standard 680.
05	The system shall be provided with air filters that have been labeled by the manufacturer to disclose efficiency and pressure drop ratings that conform to the efficiency and pressure drop requirements for the air filter grilles/racks.
<b>The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.</b>	

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



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K. HERS Verification Requirements for Space Conditioning Equipment		
01	02	03
SC System ID/Name from CF1R	SC System Description of Area Served	MCH-25 Refrigerant Charge
Notes:		

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<b>L. Space Conditioning Systems, Ducts and Fans – Mandatory Requirements and Additional Measures</b>	
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.	
<b>Heating Equipment</b>	
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).
<b>Cooling Equipment</b>	
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 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.
<b>Air Distribution System Ducts, Plenums and Fans</b>	
11	Insulation: The 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.
<b>Heat Pump Thermostat</b>	
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.
<b>The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met.</b>	



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<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>		
1. I certify that this Certificate of Installation documentation is accurate and complete.		
Documentation Author Name:	Documentation Author Signature:	
Documentation Author Company Name:	Date Signed:	
Address:	CEA/HERS Certification Identification (if applicable):	
City/State/Zip:	Phone:	
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>		
I certify the following under penalty of perjury, under the laws of the State of California:		
<ol style="list-style-type: none"> <li>The information provided on this Certificate of Installation is true and correct.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>		
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-01b-E User Instructions**

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

Completing these documents will require that you have the Reference Appendices for the 2016 Building Energy Efficiency Standards. This document contains the Joint Appendices which are used to determine climate zone and to complete the section for opaque surfaces.

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

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

**A. General Information**

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

**B. Space Conditioning (SC) System Information**

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

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

- 1 This field is filled out automatically. It is referenced from the previous section.
- 2 This field is filled out automatically. It is referenced from the previous section.
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- 11 This field is filled out automatically. It is calculated based on entries in previous columns.
- 12 If the space conditioning system is a multiple-split system, then enter the number of ducted/ductless indoor units (AHU) connected to the outdoor unit.
- 13 If the indoor unit is used to bring outdoor air into the dwelling, the system may be used to comply with the IAQ mechanical ventilation requirements. This is called central fan integrated ventilation (CFI). Select CFI System if the system is used to provide IAQ ventilation.

**D. Installed Heating Equipment Information**

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from a previous section.
4. Enter the certified heating efficiency of the *installed* equipment. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
5. Enter the name of the *installed* Heating Unit Manufacturer as shown on the equipment nameplate.

6. Enter the name of the *installed* Heating Unit Model Number as shown on the equipment nameplate.
7. Enter the name of the *installed* Heating Unit Serial number as shown on the equipment nameplate.
8. Enter the rated heating capacity (output) of the *installed* Heating Unit in BTUs per hour.

**E. Installed Cooling Equipment Information:**

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. This field is filled out automatically. It is referenced from Section C.
4. Enter the certified cooling efficiency of the *installed* equipment that corresponds to the type shown in the previous column. This value is verified against the minimum value shown in Section C. The installed efficiency must be greater than or equal to the required minimum efficiency.
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.
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.

**F. Extension of Existing Duct System, Greater Than 40 Feet**

1. This field is filled out automatically. It is referenced from a previous section.
2. This field is filled out automatically. It is referenced from a previous section.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc.
4. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value required by the standards. The installed R-value must be greater than or equal to the required minimum R-value.

**G. Installed Duct System information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. Enter a brief name or description of the indoor unit area served. Examples: Master Bedroom, Dining Room, Living Room, etc..
4. Enter the description of the total combined length of the supply and return ducts on this indoor unit. The possible choices are: >10ft length, and ≤10ft length.
5. This field is filled out automatically. This is the minimum R-value for new ducts in this climate zone.
6. Select the choice that best describes the predominant location of the supply ducts for this system.
7. Enter the R-value of the *installed* supply ducts. This value is verified against the minimum value in G05. The installed R-value must be greater than or equal to the minimum R-value.
8. Select the choice that best describes the predominant location of the return ducts for this system.
9. Enter the R-value of the *installed* return ducts. This value is verified against the minimum value shown in Section C. The installed R-value must be greater than or equal to the required minimum R-value.
10. The duct system 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 conditioned 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. Pick the appropriate choice. Refer to section 150.0(m)13 of the 2019 Building Energy Efficiency Standards, and Section 4.4 of Chapter 4 of the 2019 Residential Compliance Manual for more information.
12. Specify the number of air filter devices installed on this indoor unit. Air filter devices installed in completely new systems must be properly sized, as documented in the next section. The value entered here will determine the number of rows needed in the following section.
13. If the system is of a type that can use one of the Reference Residential Appendix RA3.3 protocols for testing the airflow rate, then enter yes. Otherwise enter no. Most ducted split systems and package systems are of the type that minimum airflow can be verified using an approved measurement procedure. Examples of systems that do not meet this description are ductless systems. A "No" response here may subject the project to additional scrutiny by enforcement personnel. Note: that the protocol in RA3.3.3.1.5 (Alternative to Compliance with Minimum System Airflow Requirements for Altered Systems) is not one of the protocols that is allowed to be used to justify a "yes" to this question.

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**H. Installed Air Filter Device Information**

1. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
2. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
3. This field is filled out automatically. It is referenced from the same row and column in the previous sections.
4. Enter a descriptive name of each air filter device so that it may be distinguished from others in the same system. Examples: FG1, filter2, etc.
5. Select the appropriate type of filter device from the list.
6. Enter the design flow in CFM of the filter device. The total for all filter devices in a single system should be greater than or equal to the total system design CFM in cooling mode (or heating mode for heat-only systems).
7. Enter the nominal depth of the filter in inches. This is the dimension that is parallel to the airflow. many filters available for sale are 1-inch depth. The 2019 standards encourage use of 2-inch depth filters.
8. Enter the nominal length of the filter. for example, if the filter is 20" x 30", enter 30.
9. Enter the nominal width of the filter, for example, if the filter is a 20" x 30", enter 20.
10. This field is calculated automatically based on your entries in 8 and 9.
11. This value is calculated automatically for 1-inch depth filters. 2-inch depth or greater filters may use a value determined by the system designer.
12. This field determines whether a 1-inch depth filter complies with the sizing requirements in section 150.0(m)12. A 2-inch depth or greater filter may use the face area determined by the system designer, however most systems have to meet airflow rate and fan efficacy requirements.
13. Enter the design static pressure drop determined by the system designer if 2-inch or greater filters are used. For 1-inch depth filters, the maximum pressure drop is mandatory 0.1 inch W.C.. Filters installed in the filter grille/rack must be capable of meeting this maximum pressure drop at the design airflow rate, as shown on the manufacturer's filter label. Not accounting for higher filter pressure drops will result in poor system airflow characteristics, reduced capacity and reduced efficiency. This may result in not passing field verification.

**I. Air Filter Device Requirements**

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

**J. HERS Verification Requirements**

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

**K. 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.

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

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

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**A. General Information**

01	Dwelling Unit Name	<<default reference text from CF1R; or allow user override input: text, 15 character maximum>>	02	Climate Zone	<<default reference text from CF1R >>
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<p>03</p>	<p>Dwelling Unit Total Conditioned Floor Area (ft<sup>2</sup>)</p>	<pre> &lt;&lt;numeric: xxxx; <b>if1 parent is CF1R-PRF, then</b>   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  <b>elseif parent is CF1R-NCB-01, then</b>   <b>if3 project scope = New Addition greater than 1,000 ft2</b>   then prompt user to enter a value equal to dwelling unit   existing CFA + addition CFA   <b>elseif project scope = Newly Constructed Building, then</b>     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   <b>elseif parent is CF1R-ADD-01, then</b>     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    <b>elseif parent is CF1R-ALT-01, then</b>     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.     <b>elseif Building Type=Multifamily, then</b>       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 &gt;&gt;         </pre>	<p>04</p> <p>Number of Space Conditioning Systems in this Dwelling Unit</p>	<pre> &lt;&lt;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&gt;&gt;         </pre>
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05	Certificate of Compliance Type	<< reference document type property from CF1R: allowed values: <u>performance (CF1R-PRF)</u> ; or <u>prescriptive additions/alterations (CF1R-ADD/CF1R-ALT)</u> ; or <u>prescriptive newly constructed (CF1R-NCB)</u> >>	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: integer: xxxxx; or allow selection of value=n/a if value in A06="n/a equipment changeout, like-for-like" >>	08	Calculated Dwelling Unit Heating Load (Btu/h)	<<user entry: integer: xxxxx; or allow selection of value=n/a if value in A06="n/a equipment changeout, like-for-like">>
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= <u>prescriptive additions/alterations</u> , then display doc variation MECH01b, elseif CertComplianceType= <u>prescriptive newly constructed</u> , then display doc variation MECH01c (this field not visible to user) endif1>>

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

**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 **A04**>>

01	02	03	04	05	06	07	08	09	10
SC System ID/Name from CF1R	SC System Description of Area Served	CFA served by this SC System (ft <sup>2</sup> ):	Is the SC system a ducted system?	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
<<reference values from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required;  do not allow duplicate system names to be used for this dwelling unit>>	<<reference values from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required  do not allow duplicate system descriptions to be used for this dwelling unit>>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; allow user to override the default and input a new value; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<< Calculated field: determine the correct result for "alteration type" for entry in this field by the user responses in <b>B04, B05, B06, B07, B08, B09</b> and use of Logic Table for Determining Alteration Type and HERS Verification Requirements (inserted below this section); constrain user input for fields <b>B04-B09</b> to allow only the available combinations of responses given in the Logic Table in rows a through s; 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 >>

**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 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-B,C	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-B,C	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-B,C	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-B,C	e.g. changeout refrigerant containing component + new duct system

<b>m</b>	no	no	yes	no	no	yes	Entirely new space conditioning system	none	e.g. new ductless hydronic heating system
<b>n</b>	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)
<b>o</b>	yes	no	yes	yes	yes	yes	Entirely new space conditioning system	DctLk + FE/AF or Tbl150.0-B,C	e.g. new ducted hydronic heating system
<b>p</b>	yes	yes	yes	yes	yes	yes	Entirely new space conditioning system	RC + DctLk + FE/AF or Tbl150.0-B,C	e.g. new split system
<b>q</b>	yes	no	no	yes	no	no	Extension of an existing duct system	DctLk	e.g. altered ducts
<b>r</b>	no	no	no	no	no	no	System is exempt from the alteration requirements	none	no alteration performed
<b>s</b>	yes	no	no	no	no	no	System is exempt from the alteration requirements	none	no alteration performed
<b>t</b>	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)

DctLk = Duct Leakage Test (MCH-20)

FE/AF or Tbl150.0-B,C - Fan Efficacy and Airflow Rate verification (MCH-22; MCH-23) or alternative compliance: (MCH-28)

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

<< require one row of data in this table for each of the SC Systems listed in Section B for which Alteration Type in B10≠ no alteration performed >>

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	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	Number of Ducted Indoor Units Connected to the System's Outdoor Unit	Central Fan Integrated (CFI) Ventilation System Status
<<reference value from B01->>	<<reference value from B02->>	<< reference value from CF1R as default; allow user to override the default and 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; *N/A (no heating); *Small duct high velocity HP; *Ductless multi-split HP; *Ductless VRF HP; *Packaged gas furnace  flag non-default values and report in project status notes field; a revised CF1R may be required >>	<< reference value from CF1R as default; allow user to override the default and 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; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<if C03 = hydronic, hydronic = forced air, combined hydronic, combined hydronic + forced air, hydronic HP or hydronic HP + forced air, then display NA; else reference value from CF1R as default; if C04 = no heating component altered, then value =n/a else allow user to override the default and pick one from list: *AFUE; *HSPF; *COP; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<< if C03 = hydronic, hydronic + forced air, combined hydronic, combined hydronic + forced air, hydronic HP or hydronic HP + forced air, then display NA; else reference value from CF1R as default; if C04 = no heating component altered, then value =n/a else allow user to override the default to enter value: user enter xx.x; default minimum value for AFUE= 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; a revised CF1R may be required>>	<<reference value from CF1R as default; allow user to override the default and 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; *gas absorption AC *room AC; *room HP; *hydronic HP, *hydronic HP+forced air *evaporative - direct *evaporative - indirect *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 multi-split HP; *Ductless multi-split AC; *Ductless VRF HP; *Ductless VRF AC; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<< reference value from CF1R as default; allow user to override the default and 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; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; if C08= no cooling component altered, then value =n/a else allow user to override the default; to enter value: user pick from list: *SEER; *EER; flag non-default values and report in project status notes field; a revised CF1R may be required >>	<<reference value from CF1R as default; if C08= no cooling component altered, then value =n/a else allow user to override the default to enter value: xx.x; default minimum value for SEER=13; allow user to overwrite default value, but flag non-default values and report in project status notes field a revised CF1R may be required >>	<<If alteration type in B10=Extension of Existing Duct System; then display result: "N/A"; else display result: "setback">>	<<if B04=no, then text value = "n/a"; else default integer value =1;  allow user to overwrite the default to enter an integer value greater than 1>>	<<user pick one from list: *CFI System *Not CFI>>

Notes:

**D. Installed Heating Equipment Information**

<< If all systems listed in Section C have a value in C04= no heating component altered, then display the section does not apply message; else require one row of data in this table for each of the SC Systems listed in Section C that do not have a value in C04= no heating component altered>>

01	02	03	04	05	06	07	08
SC System ID/Name from CF1R	SC System Description of Area Served	Heating Efficiency Type	Heating Efficiency Value	Heating Unit Manufacturer	Heating Unit Model Number	Heating Unit Serial Number	Rated Heating Capacity, Output (Btu/h)
<<reference value from B01>>	<<reference value from B02>>	<<reference value from C05>>	<<if C06 = NA, then report NA; Else user input, numeric, xx.x;  check value must be ≥ value in C06, to comply; else flag non-compliant value and do not allow this document to be registered >>	<<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, xxxx>>

Notes:

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**E. Installed Cooling Equipment Information:**

<<if all of the SC Systems listed in Section C have a value in C07=no cooling, then display the section does not apply message; else require one row of data in this table for each of the SC Systems listed in Section C that do not have: a value in C07=no cooling or a value in C08 = no cooling component altered >>

01	02	03	04	05	06	07	08	09
SC Identification or Name	SC System Description of Area Served	Cooling Efficiency Type	Cooling Efficiency Value	Condenser or Package Unit Manufacturer	Condenser or Package Unit Model Number	Condenser or Package Unit Serial Number	System Cooling Capacity at Design Conditions (Btu/h)	Condenser Nominal Capacity (ton)
<<reference value from B01>>	<<reference value from B02>>	<<reference value from C09>>	<<user input, numeric, xx.x; check value must be ≥ value in C10 to comply; else flag non-compliant value and do not allow this document to be registered >>	<<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>>

Notes:

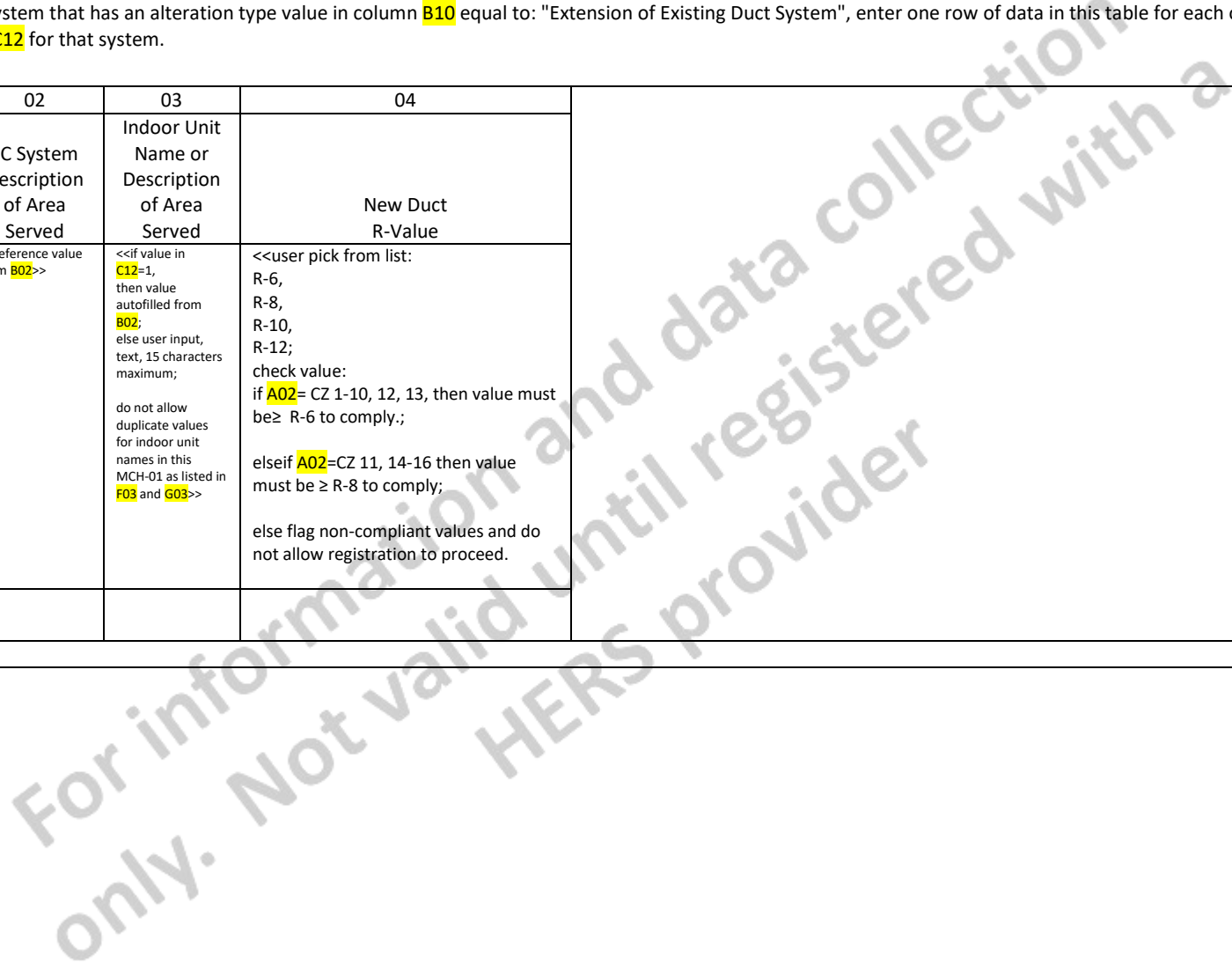


**F. Extension of Existing Duct System, Greater Than 40 Feet**

<<if there are no Alteration Types in column B10 equal to "Extension of Existing Duct System" then display the "section does not apply" message;  
 else for each SC System that has an alteration type value in column B10 equal to: "Extension of Existing Duct System", enter one row of data in this table for each of the quantity of ducted indoor units specified in C12 for that system.

01	02	03	04
SC Identification or Name	SC System Description of Area Served	Indoor Unit Name or Description of Area Served	New Duct R-Value
<<reference value from B01>>	<<reference value from B02>>	<<if value in C12=1, then value autofilled from B02; else user input, text, 15 characters maximum;  do not allow duplicate values for indoor unit names in this MCH-01 as listed in F03 and G03>>	<<user pick from list: R-6, R-8, R-10, R-12; check value: if A02= CZ 1-10, 12, 13, then value must be ≥ R-6 to comply.;  elseif A02=CZ 11, 14-16 then value must be ≥ R-8 to comply;  else flag non-compliant values and do not allow registration to proceed.

Notes:



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

<<if all SC systems in section B have a value in B04=no, then display the section does not apply message;  
 elseif there are no SC Systems listed in Section B for which a yes response was given in B08, then display the section does not apply message;  
 else for each space conditioning system in Section B that has a value in B08=yes, enter one row of data in this table for each of the quantity of ducted indoor units in C12 for that system.

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	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	Exemption 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 RA3.3 Airflow Protocols be used to test this System?
<<reference value from B01>>	<<auto filled from B02>>	<<if value in C12=1, then value autofilled from B02; else user input, text, 15 characters maximum; do not allow duplicate values for indoor unit names in this MCH-01 as listed in F03 and G03>>	<<user pick one text value from the following 2: *>10ft *≤10ft>>	<<if A02=CZ 1-10, 12, 13, then value = R-6; elseif A02=CZ 11, 14-16 then value = R-8>>	<<User 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>>	<<user pick from list: *R-4.2 *R-6, *R-8, *R-10, *R-12; check value: must be ≥ value in G05 to comply subject to the following exception: if G10= *Ducts ≥R4.2 entirely in Conditioned Space, then R-4.2 complies;>>	<<User 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>>	<<user pick from list: *R-4.2 R-6, R-8, R-10, R-12; check value: must be ≥ value in G05 to comply subject to the following exception: if G10= *Ducts ≥R4.2 entirely in Conditioned Space, then R-4.2 complies >>	<< Default Value=No Exemption; allow user to override the default and select one or more of the following two values: **uninsulated ducts in wall cavity **Uninsulated exposed ducts in directly conditioned space; ALSO if values in both G06 and G08= conditioned space-entirely then also allow user to select the following value: **Ducts ≥R4.2 entirely in conditioned space	<<if C07=no cooling, then text value = "Exempt - No Cooling"; elseif C07= one of the following three system types: **evaporative - direct, or **evaporative - indirect, or **evaporative - indirectirect, then text value = "Exempt - Evaporative System"; elseif G13=no, then text value = "Exempt - RA3.3 Protocols are N/A"; elseif B08=yes, AND C13=CFI System, then result = HERS Verified Fan Efficacy (W/cfm) and Airflow Rate(cfm/ton); else, user select one from the following two values: **HERS Verified Fan Efficacy (W/cfm) and Airflow Rate (cfm/ton); **HERS verified Return Duct Design per Table 150.0-B, C; >>	<<user enter integer value>>  note: this value will determine number or rows per indoor unit in next section	<<user pick one from list: **yes **no>>

Notes:

**H. Installed Air Filter Device Information**

Mandatory requirements for air filter devices are specified Section 150.0(m)12. The installer shall place a sticker in or near 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 Section G does not apply, then display the section does not apply message; elseif there are no indoor units in G03 that have a value in G04 equal to ">10ft", then display the section does not apply message; else require one row of data (each) for the quantity of air filter devices in G12 for each of the Indoor units listed in G03 for which the value in G04 is: >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 (inch <sup>2</sup> )	Air Filter Required Minimum Face Area (inch <sup>2</sup> )	Face Area Compliance	Design Allowable Pressure Drop for Air Filter Device (inch W.C.)
<<reference value from B01>>	<<auto filled from B02>>	<<auto filled from G03>>	<<user input text, maximum 20 characters>> >	<<user select from list: *Filter Grille Mounted *Furnace Mounted *Duct Mounted >>	<<user enter value numeric; xxx>>	<<user enter integer value ≥1.00>>	<<user enter integer value ≥1.00>>	<<user enter integer value ≥1.00>>	<<calculated numeric value=(H08*H09)>>	<<if H07=1, then calculated value=(H06 ÷ 150) *144, else display text value = "specified by system designer">>	<<if value in H11="specified by system designer", then display text value = "specified by system designer"; elseif H10>H11, then display text: "complies", else display text:"does not comply">>	<<if value in H07=1, then value = 0.1; else user enter value, numeric, x.xx>>

Notes:

**I. Air Filter Device Requirements**

<<if section H does not apply, then display the section does not apply message; elseif Section H applies, then display section I.

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 filter media having a designated efficiency equal to or greater than MERV 6 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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**J. HERS Verification Requirements for Duct Systems**

<< require one row of data in this table for each of the indoor units listed in **F03**;  
 also require one row of data in this table for each of the indoor units listed in **G03**>>

01	02	03	04	05	06	07	08	09
SC System Identification or Name	SC System Location or Area Served	Indoor Unit Name or Description of Area Served	Exemption From Duct Leakage Requirements	MCH-20 Duct Leakage Test	MCH-21 Duct Location Verification	MCH-22 AHU Fan Efficacy (W/cfm)	MCH-23 AHU Airflow Rate (cfm/ton)	MCH-28 Return Duct Design - Table 150.0-B or C
<<reference value from <b>B01</b> >>	<<auto filled from <b>B02</b> >>	<<auto filled from <b>F03</b> or <b>G03</b> as applicable	<< calculated field: If <b>B04</b> =no, then value=N/A;  else Default text Value= "No Exemptions";  allow user to override the default and pick one of the following three text 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 value in <b>B04</b> =no (system with no ducts), then display result in this field=no  elseif <b>J04</b> =N/A, then display result in this field=no,  elseif <b>J04</b> ≠ No Exemptions, then display result = no;  elseif <b>J04</b> = No Exemptions, then determine the result for this field by the user responses in <b>B04, B05, B06, B07, B08, B09</b> and use of Logic Table for Determining Alteration Type and HERS Verification Requirements (inserted below section B); constrain user input for fields <b>B04-B09</b> to allow only the available combinations of responses given in the Logic Table in rows a through t; If the term " <b>DctLk</b> " appears in the HERS column, then display text result= "yes" in this field (duct leakage test required); elseif the term " <b>DctLk</b> " does not appear in the HERS column, then display result= "no" in this field >>	<< Calculated field: if value in <b>B04</b> =no (system with no ducts), then display text result ="no"  elseif the value in <b>G10</b> = *Ducts ≥R4.2 entirely in conditioned space, and the values in either <b>G07</b> or <b>G09</b> are < <b>G05</b> , then display text result in this field="yes";  elseif <b>G10</b> = one of the following two: *uninsulated ducts in wall cavity *Uninsulated exposed ducts in directly conditioned space, then text result="yes"  else display text result="no">>	<< Calculated field: if value in <b>B04</b> = "no" (system with no ducts), then display result in this field="no"  elseif the value in <b>G11</b> = "HERS Verified Fan Efficacy (W/cfm) and Airflow Rate (cfm/ton)", then display text result in this field="yes";  elseif all of the following three conditions are true: ** <b>B09</b> =yes ** <b>C07</b> =no cooling ** <b>C13</b> =CFI System, then result= yes;  else display text result="no">>	<< Calculated field: if value in <b>B04</b> =no (system with no ducts), then display result in this field=no  elseif the value in <b>G11</b> = "HERS Verified Fan Efficacy (W/cfm) and Airflow Rate (cfm/ton)", then display text result in this field="yes";  elseif the value in <b>P03</b> =yes, AND the value in <b>J09</b> =no, then text result in this field=yes  elseif all of the following three conditions are true: ** <b>B09</b> =yes ** <b>C07</b> =no cooling ** <b>C13</b> =CFI System, then result= yes;  else display text result="no">>	<< Calculated field: if value in <b>B04</b> = "no" (system with no ducts), then display text result in this field=no  elseif the value in <b>G11</b> = "HERS verified Return Duct Design per Table 150.0-B, C"; then display text result in this field="yes";  else display text result="no">>
Notes:								

K. HERS Verification Requirements for Space Conditioning Equipment		
<<require one row of data in this table for each of the SC Systems listed in Section C>>		
01	02	03
SC System ID/Name from CF1R	SC System Description of Area Served	MCH-25  Refrigerant Charge
<<auto filled from B01>>	<<auto filled from B02>>	<< Calculated field: If [C07 or C03] = one of the following 2 values: *non-airsource heat pump *non-air-cooled air conditioner then result = no;  else determine value 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 section B); 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;  If the term "RC" appears in the HERS column, and A02 =one of the CZ values in the following list: 2, 8, 9, 10, 11, 12, 13, 14, 15, then display text result in this field = yes;  else display result = no>>
Notes:		

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**L. 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 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 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.**

<b>DOCUMENTATION AUTHOR'S DECLARATION STATEMENT</b>	
1. I certify that this Certificate of Installation documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Documentation Author Company Name:	Date Signed:
Address:	CEA/HERS Certification Identification (if applicable):
City/State/Zip:	Phone:
<b>RESPONSIBLE PERSON'S DECLARATION STATEMENT</b>	
I certify the following under penalty of perjury, under the laws of the State of California:	
<ol style="list-style-type: none"> <li>The information provided on this Certificate of Installation is true and correct.</li> <li>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.</li> <li>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.</li> <li>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.</li> </ol>	
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: <span style="float: right;">Date Signed:</span>

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