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STATE OF CALIFORNIA

DUCT LEAKAGE DIAGNOSTIC TEST

CEC-CF3R-MCH-20-H (Revised 01/19) CALIFORNIA ENERGY COMMISSION

CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 1 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

A. System Information		
01	Space Conditioning System Identification or Name	
02	Space Conditioning System Location or Area Served	
03	Indoor Unit Name	
04	Building Type from CF1R	
05	Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Credit from CF1R?	
06	Verified Low Leakage Air-handling Unit Credit from CF1R?	
07	Duct System Compliance Category	
08	Any portions of Duct Located in Garage?	

MCH-20a - Completely New Duct System

B. Duct Leakage Diagnostic Test		
01	Air-Handling Unit Airflow (AHU Airflow) Determination Method	
02	Condenser Nominal Cooling Capacity (ton)	
03	Indoor Unit Nominal Cooling Capacity	
04	Heating Capacity (kBtu/h)	
05	Conditioned Floor Area Served by this HVAC System (ft^2)	
06	Measured AHU Airflow (cfm)	
07	Duct Leakage Test Conditions	
08	Duct Leakage Test Method	
09	Leakage Factor	
10	Calculated Target Allowable Duct Leakage Rate (cfm)	
11	Actual Duct Leakage Rate from Leakage Test Measurement (cfm)	
12	Compliance Statement:	
13	Notes:	

CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
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C. Additional Requirements for Compliance		
01	System was tested in its normal operation condition. No temporary taping allowed.	
02	Outside air (OA) duct connections to the central forced air duct system shall not be sealed/taped off during duct leakage testing. OA ducts used for Central Fan Integrated (CFI) Indoor Air Quality ventilation systems, or Central Fan Ventilation Cooling Systems, that utilize dampers that open only when OA is required and automatically close when OA is not required, may configure the OA damper to the closed position during duct leakage testing.	
03	All supply and return register boots were sealed to the drywall.	
04	Building cavities were not used as plenums or platform returns in lieu of ducts.	
05	If cloth backed tape was used it was covered with Mastic and draw bands.	
06	All connection points between the air handler and the supply and return plenums are completely sealed.	
Visual Inspection at Final Construction Stage (applicable if system was tested at rough-in) After installing the interior finishing wall and verifying that the above rough-in tests was completed, the following procedure must be performed:		
07	For all supply and return registers, verify that the spaces between the register boot and the interior finishing wall are properly sealed.	
08	If the house rough-in duct leakage test was conducted without an air handler installed, inspect the connection points between the air handler and the supply and return plenums to verify that the connection points are properly sealed.	
09	Inspect all joints to ensure that no cloth backed rubber adhesive duct tape is used.	
10	Verification Status:	☐ Pass - all applicable requirements are met; or ☐ Fail - one or more applicable requirements are not met. Enter reason for failure in corrections notes field below; or ☐ All N/A - This entire table is not applicable
11	Correction Notes:	
The responsible person's signature on this compliance document affirms that all applicable requirements in this table have been met unless otherwise noted in the Verification Status and the Corrections Notes in this table.		

D. Determination of HERS Verification Compliance All applicable sections of this document shall indicate compliance with the specified verification protocol requirements in order for this Certificate of Verification as a whole to be determined to be in compliance.	
01	

DUCT LEAKAGE DIAGNOSTIC TEST

CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 3 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

DOCUMENTATION AUTHOR'S DECLARATION STATEMENT	
1. I certify that this Certificate of Verification documentation is accurate and complete.	
Documentation Author Name:	Documentation Author Signature:
Company:	Date Signed:
Address:	CEA/HERS Certification Information (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 Verification is true and correct.
2. I am the certified HERS Rater who performed the verification identified and reported on this Certificate of Verification (responsible rater).
3. The installed features, materials, components, manufactured devices, or system performance diagnostic results that require HERS verification identified on this Certificate of Verification comply with the applicable requirements in Reference Appendices RA2, RA3, and the requirements specified on the Certificate of Compliance for the building approved by the enforcement agency.
4. The information reported on applicable sections of the Certificate(s) of Installation (CF2R) signed and submitted by the person(s) responsible for the construction or installation conforms to the requirements specified on the Certificate(s) of Compliance (CF1R) approved by the enforcement agency.
5. I will ensure that a registered copy of this Certificate of Verification 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 Verification is required to be included with the documentation the builder provides to the building owner at occupancy.

BUILDER OR INSTALLER INFORMATION AS SHOWN ON THE CERTIFICATE OF INSTALLATION	
Company Name (Installing Subcontractor, General Contractor, or Builder/Owner):	
Responsible Builder or Installer Name:	CSLB License:

HERS PROVIDER DATA REGISTRY INFORMATION	
Sample Group Number (if applicable):	Dwelling Test Status in Sample Group (if applicable):

HERS RATER INFORMATION	
HERS Rater Company Name:	
Responsible Rater Name:	Responsible Rater Signature:
Responsible Rater Certification Number w/ this HERS Provider:	Date Signed:

CF3R-MCH-20a-H User Instructions

Section A. System Information

1 *HVAC System Identification or Name*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
2. *HVAC System Location or Area Served*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
3. *Indoor Unit Name:* This field is filled out automatically. It is referenced from the CF2R-MCH-20, which must be completed prior to this document.
4. *Building Type*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
5. *Verified Low Leakage Ducts in Conditioned Space (VLLDCS)*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
6. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
7. *Duct System Compliance Category*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
8. *Any portions of Duct Located in Garage*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.

Section B. Duct Leakage Diagnostic Test - MCH-20a - Completely New Duct System

1. *Air-Handling Unit Airflow (AHU Airflow) Determination Method*: User will select from the following options:
   a. Default Airflow Method: The Default Airflow Method may only be used for homes where the duct system is being tested before the conditioning and heating system is installed and the equipment specification is not known (See Section RA3.1.4.2.1 of the 2019 Reference Appendices).
   b. Cooling System Method: For systems with air conditioning, this selection must be made, and the nominal air handler airflow shall be 400 CFM per nominal ton of condensing unit cooling capacity as specified by the manufacturer (Note: the heating only value may be used, if higher, See Section RA3.1.4.2.2 of the 2019 Reference Appendices).
   c. Heating System Method: For heating only systems the nominal air handler airflow shall be 21.7 CFM per kBtu/hr of rated heating output capacity.
   d. Measured Airflow Method: The measured system airflow can be used as the air handler airflow for the purpose of establishing duct leakage percentage (See Section RA3.1.4.2.3 of the 2019 Reference Appendices).
   e. Indoor Unit Method:
2. *Condenser Nominal Cooling Capacity (ton)*: Same data given on MCH-01. Should be consistent with CF2R-MCH-20 for this system.
3. *Indoor Unit Nominal Cooling Capacity:* Same data given on MCH-01. Should be consistent with CF2R-MCH-20 for this system.
4. *Heating Capacity (kBtu/h)*: Same data given on MCH-01. Should be consistent with CF2R-MCH-20 for this system.
5. *Conditioned Floor Area Served by this HVAC System (ft^2)*: User must input CFA for the space. Should be consistent with CF2R-MCH-20 for this system.
6. *Measured AHU Airflow (CFM)*: If "Measured Airflow Method" is selected as the *Air-Handling Unit Airflow (AHU Airflow) Determination Method*, user must input measured airflow.*Duct Leakage Test Conditions*: *Test Final* is the only option for raters.
7. *Duct Leakage Test Method*: Select from the following options: Leakage to the Outside (house is pressurized simultaneously with the ducts such that only leakage going outside of the pressurized conditioned shell is measured, see RA3.2.4.3.4), or Total Leakage.
8. *Leakage Factor*: This field is automatically filled out based on choices in previous fields.
9. *Calculated Target Allowable Duct Leakage Rate (cfm)*: This value will be automatically calculated based on values entered in previous fields.
10. *Actual Duct Leakage Rate from Leakage Test Measurement (cfm)*: Input the duct leakage rate taken from actual test measurements.
11. *Compliance Statement*: If Actual Duct Leakage Rate from leakage test is less than or equal to Calculated Target Allowable Duct Leakage Rate, "System passes leakage test" will automatically populate. If not, "System fails leakage test" will automatically populate.
12. *Notes*: This field is automatically filled out. The values in B02, B03, B04 and B05 are checked against the values in the same rows of the CF2R-MCH-20 for this system. If they do not match, an error message will appear here.

Section C Additional Requirements for Compliance

1. This field must be a true statement (or not applicable) for the system to comply.
2. This field must be a true statement (or not applicable) for the system to comply.
3. This field must be a true statement (or not applicable) for the system to comply.
4. This field must be a true statement (or not applicable) for the system to comply.
5. This field must be a true statement (or not applicable) for the system to comply
6. This field must be a true statement (or not applicable) for the system to comply
7. This field must be a true statement (or not applicable) for the system to comply
8. *Verification Status:* If this Section does not apply, then select "All N/A". If the system meets all of the additional requirements for compliance then select "Pass", otherwise select "Fail". The latter selection means that the system does not meet the requirements and the system will need to be modified to meet the requirements or airflow and fan efficacy will have to be verified by diagnostic testing.

9. *Correction Notes:* If one or more applicable requirements are not met "Fail" will appear in the row above. When this occurs the rater is required to enter detailed notes here that describes what failed and why.

Section D. Determination of HERS Verification Compliance

1. This field is filled out automatically. Compliance requires that all individual criteria pass.