DUCT LEAKAGE DIAGNOSTIC TEST

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	Building Type from CF1R:	
04	Verified Low Leakage Ducts in Conditioned Space (VLLDCS) Credit from CF1R?	
05	Verified Low Leakage Air-handling Unit Credit from CF1R?	
06	Duct System Compliance Category:	

MCH-20e - Sealing All Accessible Leaks using Smoke Test

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

C. Additional Requirements for Compliance		
01	System was tested in its normal operation condition. No temporary taping allowed.	
02	Outside air (OA) ducts for Central Fan Integrated (CFI) ventilation systems, shall not be sealed/taped off during duct leakage testing. CFI OA ducts that utilize controlled motorized dampers, that open only when OA ventilation is required to meet ASHRAE Standard 62.2, and close when OA ventilation is not required, may be configured 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.	
07	If the system complies using the Smoke Test method, the smoke test was conducted in accordance with the requirements of Reference Residential Appendix RA3.1.4.3.6. Systems that comply using smoke test shall not be included in sample groups for HERS verification compliance.	
08	Verification Status:	
09	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.

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CERTIFICATE OF VERIFICATION		CF3R-MCH-20-H
Duct Leakage Diagnostic Test		(Page 2 of 3)
Project Name:	Enforcement Agency:	Permit Number:
Dwelling Address:	City:	Zip Code:

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	

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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:

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CF3R-MCH-20e-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. *Building Type*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
4. *Verified Low Leakage Ducts in Conditioned Space (VLLDCS)*: This field is filled out automatically. It is referenced from the CF2R-MCH-20.
5. *Verified Low Leakage Air-handling Unit (VLLAHU) Credit:* This field is filled out automatically. It is referenced from the CF2R-MCH-20.
   Duct System Compliance Category: This field is filled out automatically. It is referenced from the CF2R-MCH-20.

Section B. Duct Leakage Diagnostic Test - MCH-20e - Sealing All Accessible Leaks using Smoke Test

1. *Condenser Nominal Cooling Capacity (ton)*: Same data given on MCH-01.
2. *Heating Capacity (kBtu/h)*: Same data given on MCH-01;
3. *Conditioned Floor Area Served by this HVAC System (ft^2)*: User must input CFA for the space. Should be consistent with the CF1R input value.
4. *Duct Leakage Test Conditions*: Select from the following options:
   a. Test Rough-in AHU: Installers may determine duct leakage in new construction by using diagnostic measurements at rough-in building construction stage prior to installation of interior finishing (See Section RA3.1.4.3.2 of the ~~2013~~2016 Reference Appendices). In this case the air handling unit (AHU) is installed at the time of test.
   b. Test Rough-in No AHU: Same as "Test Rough-in" except air handling unit is not yet installed (See Section RA3.1.4.3.2 of the ~~2013~~2016 Reference Appendices).
   c. Test Final: Test conducted at "final", i.e. all equipment, ducts, and registers are installed and the system is essentially in its final operating condition. (rough-in no longer an option. See Section RA3.1.4.3.1 of the ~~2013~~2016 Reference Appendices).
5. *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.
6. *Leakage Factor*: This field is automatically filled out based on choices in previous fields.
7. *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 ~~2013~~2016 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 ~~2013~~2016 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 ~~2013~~2016 Reference Appendices).
8. *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.
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 rater taken from actual test measurements.
11. *Compliance Statement*: If measured leakage (B10) is less than or equal to allowable duct leakage rate (B9), "system passes - system complies with Allowable Duct Leakage Rate Criterion" will automatically populate.
    If measured leakage is greater than allowable duct leakage rate, then the following will automatically populate:
    "System passes using smoke test of an altered HVAC system in an existing building
    - No visible smoke exits the accessible portions of the duct system.
    - Smoke is only emanating from air handler unit (AHU cabinet and non-accessible portions of the duct system.
12. *Notes*: This field is automatically filled out. The values in B01, B02 and B03 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.

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Section C Additional Requirements for Compliance

1. This field must be a true statement (or not applicable) for the system to comply.
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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 describe 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.

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