BUILDING LEAKAGE DIAGNOSTIC TEST

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

A. Building Air Leakage – General Information		
01	Test Procedure Used	
02	Building Air Leakage Target from CF1R	
03	Indoor Temperature During Test (degreeF)	
04	Outdoor Temperature During Test (degreeF)	
05	Blower Door Location	
06	Building Elevation (ft)	
07	Building Volume (ft^3)	
08	Date of the Diagnostic Test for this Dwelling	

B. Diagnostic Equipment Information					
01	Number of Manometers Used to Measure Home Pressurization				
02	03	04	05	06	
Manometer Make	Manometer Model	Manometer Serial Number	Manometer Calibration Date	Manometer Calibration Status	
07	Number of Fans Used to Pressurize Home				
08	09	10	11		
Fan Make	Fan Model	Fan Serial Number	Fan configuration (rings)		

ENV20c – Multi-Point Air Tightness Test

C. Envelope Leakage Diagnostic Test		
01	Name and Version of ASTM E779-10 Compliant Software Used for Multi-point test	
02	Pre-test Baseline Building Pressure	
03	Time Average Period of Meter	
04	Test Methodology	
05	Unadjusted Building Pressure Target	
06	Unadjusted Building Pressure Measured	
07	Induced Building Pressure	
08	A minimum of eight readings were taken spaced evenly between 15 Pa and 60 Pa (or highest attainable pressure)	
09	Post-test Baseline Building Pressure	
10	Corrected CFM50 (from software)	

D. Altitude and Temperature Correction (not used, performed by blower door software)

E. Accuracy Adjustment		
01	Percent Uncertainty @ 95% Confidence Level (from software)	
02	Accuracy Level	
03	Accuracy Adjustment Factor	
04	Adjusted CFM50 (measured air leakage rate)	

F. Compliance Statement	
01	

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G. Additional Requirements for Compliance		
01	Open all interior doors and access including those to closets and those between a conditioned basement and attic.	
02	HVAC Supply and return register dampers shall be fully open.	
03	Temporarily sealing of combustion flues and intermittent exhaust fans are not allowed. Some examples are: combustion flues, fresh air intakes, dryer vents, bathroom and kitchen exhaust vents and fire place.	
04	Continuously operated ventilation devices like energy recovery ventilators may be sealed.	
05	Multifamily – Each dwelling unit must be tested individually and shown to meet the leakage requirements. Pressurization of the adjacent dwelling units while conducting this test is not allowed.	
06	Verification Status:	
07	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.		

H. 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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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-ENV20c-H User Instructions

Section A. Building Air Leakage – General Information

1. Select the appropriate test procedure. This selection will determine which version of this document will be used (a, b, c, d, or e) and therefore which data must be collected. Note that single-point tests can only be used under certain conditions. Note that newer manometers have automatic functions for compensating for baseline (automatic baseline) and compensating for house pressures other than the target (@50 Pa). It is preferable to use these, when available, however if these automatic functions are to be used, they must be used for BOTH automatic baseline and pressure compensation.
2. This number is automatically pulled from the performance approach Certificate of Compliance and is the target maximum that was entered by the documentation author. If this number cannot be achieved, the performance compliance calculations can be redone with a higher number or without the requirement for building air leakage.
3. Enter the indoor temperature measured at the time that the building air leakage test was performed.
4. Enter the outdoor temperature measured at the time that the building air leakage test was performed.
5. Provide a brief description of the location where the blower door was installed for the test. Examples: "front entry door on west side of house", "door between house and garage", "large window in family room".
6. Enter the building elevation use the value for the closest city found in Joint Appendix JA2.2. Only elevations higher than 5,000 feet require an adjustment to the calculations.
7. This number is automatically pulled from the performance approach Certificate of Compliance. It is used to calculate air changes.
8. Enter the date that the building leakage test data was collected.

Section B. Diagnostic Equipment Information

1. Enter the number of manometers used to measure the home pressurization. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
2. Enter the make (brand) of the manometer used to collect the building air leakage data. Examples: Retrotec, Energy Conservatory.
3. Enter the model of the manometer used to collect the building air leakage data. Examples: DM-2 Mark II, DG700.
4. Enter the serial number of the manometer used to collect the building air leakage data.
5. Enter the most recent date that the manometer was calibrated by following manufacturer's calibration specifications.
6. This field is automatically filled. If the calibration date was more than 12 months prior to the test date entered in Row A.8, above, an error will appear.
7. Enter the number of blower door fan systems required to run simultaneously to pressurize the home for the building air leakage test. If more than one system is used, the fan flow numbers need to be manually added together, unless blower door software is used that will accommodate multiple fan systems running simultaneously.
8. Enter the make (brand) of the fan used to collect the building air leakage data. Examples: Retrotec, Energy Conservatory.
9. Enter the model of the fan used to collect the building air leakage data. Examples: US1000, Q46, BD3, BD4.
10. Enter the serial number of the fan used to collect the building air leakage data.
11. Enter the fan configuration shown on the meter. This is sometimes referred to as "range configuration", "CONFIG" or "rings". Examples: Open, A, B, C8.

Section C. Envelope Leakage Test (ENV20c)

1. This version of the MCH-24 requires the use of an ASTM E779-10 compliant software, typically provided by the blower door manufacturer. Confirm with the software vendor that it is compliant. Enter the name and version here.
2. Enter the Pre-test Baseline Building Pressure.
3. Enter the time average period used on the manometer during the test. Must be at least 10 seconds.
4. Select the type of test being performed: Pressurization (air blowing into house) or Depressurization (air blowing out of house). ~~All blower door induced pressures are to be negative relative to outside.~~
5. This field is automatically calculated when using the online form. The Unadjusted Building Pressure Target is the Pre-test Baseline Building Pressure plus the target building pressure (-60 Pa).
6. Enter the Measured Unadjusted Building Pressure straight from the manometer. It should be as close to the Unadjusted Building Pressure Target as possible. ~~All blower door induced pressures for the depressurization tests are to be negative relative to outside.~~
7. Enter the Induced Building Pressure straight from the manometer. ~~All blower door induced pressures for the depressurization tests are to be negative relative to outside.~~
8. When using the software for a multi-point test, a minimum of eight measurements must be taken over a range of pressures. This is where the user acknowledges that this was done.
9. Enter the Post Test Baseline Building Pressure from the manometer.
10. Enter the final Corrected CFM50 reading from the software.

Section D. Altitude and Temperature Correction (not used)

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Section E. Accuracy Adjustment

1. The software will provide a "Percent Uncertainty" value based on the readings taken. Enter that value here
2. This field is automatically calculated when using the online form . If the Percent Uncertainty level is 10% or less, the Accuracy Level is "Standard". If the Percent Uncertainty level is greater than 10%, the Accuracy Level is "Reduced".
3. This field is automatically calculated when using the online form:
    a. If the Accuracy Level is "Standard", the ~~Extending~~ Accuracy Adjustment Factor will be 1 (no adjustment)
    b. If the Accuracy Level is "Reduced", the ~~Extending~~ Accuracy Adjustment Factor will be adjusted by the Percent Uncertainty.
4. This field is automatically calculated when using the online form. The Adjusted CFM50 is the Corrected CFM50 multiplied by the Extending Factor.

Section F. Compliance Statement

1. This field is automatically calculated when using the online form. A check is performed to make sure that the meter has been properly calibrated and that the measured infiltration is less than the target infiltration.

Section G. Additional Requirements for Compliance

1. This statement must be true (or not applicable) for the test to conform to the protocols.
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4. This statement must be true (or not applicable) for the test to conform to the protocols.
5. This statement must be true (or not applicable) for the test to conform to the protocols.
6. *Verification Status:* If this Section does not apply, then select "All n/a". If the home meets all of the additional requirements for compliance then select "Pass", otherwise select "Fail". The latter selection means that the home does not meet the requirements and the home will need to be modified to meet the requirements.
7. *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 H. Determination of HERS Verification Compliance

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

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