DOCKETED	
Docket Number:	15-BSTD-02
Project Title:	Residential Compliance Manual and Documents
TN #:	232820-17
Document Title:	2016-CF3R-ENV-20e-BuildingEnvelopeAirLeakage- RepeatedSinglePointTest-AutomaticMeterpdf
Description:	N/A
Filer:	Corrine Fishman
Organization:	California Energy Commission
Submitter Role:	Public Agency
Submission Date:	4/22/2020 9:54:01 AM
Docketed Date:	4/22/2020

CE DIAGNOSTIC TEST



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CFC-0	CF3R-FN	JV-20	-H (Rev	vised (01/16)						

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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. Bui	ding Air Leakage – General Information	
01	Test Procedure Used	
02	Building Air Leakage Target from CF1R	
03	Indoor Temperature During Test (°F)	
04	Outdoor Temperature During Test (°F)	
05	Blower Door Location	
06	Building Elevation (ft)	
07	Building Volume (ft³)	
80	Date of the Diagnostic Test for this Dwelling	

B. Dia	3. Diagnostic Equipment Information						
01	Number of Manome	ters Used to Measure Home P	ressurization			10	9
	02	03	0	4	05		06
	Manometer Make	Manometer Model	Mano Sei Nun	-	Manometer Calibration Date	0. 10	anometer alibration Status
				×2			
07	Number of Fans Use	d to Pressurize Home		200	80		
08 09				7.0	10	1	1
Fan Make Fan Mode		lel	Fan Serial Number		Fan Configuration (rings)		
						•	
			70	6)			

ENV20e – Repeated Single Point Air Tightness Test With Automatic Meter

C. Env	velope Leakage Diagnostic Test	
01	Time Average Period of Meter	~11.
02	Blower Door Software Used for Calculations?	(0)
	03	04
	Induced Building Pressure	Nominal CFM50
	101, 01, 02	
	XO 1.0. \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
	. II. 27 M	
	(, 10 , 1 ,	
4. O	. 10	
05	Average Nominal CFM50	

D. Altitude and Temperature Correction					
01	Altitude Correction Factor				
02	Temperature Correction Factor				
03	Corrected CFM50				

Registration Number: Registration Date/Time: HERS Provider:

LIFORNIA ENERGY COMMISSION

BUILDING LEAKAGE DIAGNOSTIC TEST	
CEC-CF3R-ENV-20-H (Revised 01/16)	CA

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

E. Accı	uracy Adjustment	
01	Standard Deviation of Nominal CFM 50 Values Above	
02	Percent Uncertainty	
03	Accuracy Level	
04	Accuracy Adjustment Factor	
05	Adjusted CFM50 (measured air leakage rate)	
06	Corrected CFM50 (from software)	
07	Percent Uncertainty @ 95% Confidence Level	
	(from software)	

F. Con	npliance Statement	2	13		0	
01		0	V	~	10	

G. Ad	ditional Requirements for Com	iance				
01	Open all interior doors and access	ncluding those to closets and those between a conditioned basement and attic.				
02	HVAC Supply and return register of	mpers shall be fully open.				
03	Temporarily sealing of combustio	flues and intermittent exhaust fans are not allowed. Some examples are: combustion flues, fresh a	ir			
03	intakes, dryer vents, bathroom ar	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					
05	dwelling units while conducting this test is not allowed.					
		 Pass - all applicable requirements are met; or 				
06	Verification Status:	☐ Fail - one or more applicable requirements are not met. Enter reason for failure in correct	tions			
06		notes field below; or				
		☐ <u>All N/A</u> - This entire table is not applicable				
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.

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BUILDING LEAKAGE DIAGNOSTIC TEST



CEC-CF3R-ENV-20-H (Revised 01/16)

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CERTIFICATE OF VERIFICATION		CF3R-ENV-20-H
Building 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	e 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	٠.	01,					
I certify the following under penalty of perjury, under the laws of the Stat	te of California:						
1. The information provided on this Certificate of Verification is true ar							
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 build	ding approved by the enforcement agency	T_{c_3}					
4. The information reported on applicable sections of the Certificate(s) of Installation (CF2R) signed and submitte	ed by the person(s)					
responsible for the construction or installation conforms to the requ	irements specified on the Certificate(s) of	Compliance (CF1R) approved					

by the enforcement agency.
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: Date Signed:

(Page 1 of 3)

CF3R-ENV20e-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 CF1R 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 CF1R. 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 A08, 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 (ENV-20e)

- 1. Enter the Time Average Period used on the manometer during the DEPRESSURIZATION test. Must be at least 10 seconds.
- 2. This version of the MCH-24 can be used with an ASTM E779-10 compliant software, typically provided by the blower door manufacturer. Confirm with the software vendor that it is compliant.
- 3. Enter five to nine Induced Building Pressure numbers straight from the manometer.
- 4. Enter five to nine Nominal CFM50 values from the manometer that corresponds to the Induced Building Pressure values.
- 5. This field is automatically calculated. It is the average of the Nominal CFM50 values for the 5-9 repeated single point tests.

Section D. Altitude and Temperature Correction

- 1. This field is automatically calculated. The equation used to calculate this value in the field equals:
 - a. If the elevation is less than or equal to 5,000 ft, the Altitude Correction Factor is 1 (no adjustment).
 - b. If the elevation is greater than 5,000 ft, the Altitude Correction equals 1 + (0.000006 * elevation in feet)
- 2. Enter the Temperature Correction Factor from Table RA3.8-2 or RA3.8-3 using the indoor and outdoor temperatures entered in Section A.

Table RA3.8-2 Temperature Correction Factors for Pressurization Testing- Calculated according to ASTM E779-10

			Inside Temperature (F)								
		50	50 55 60 65 70 75 80						85	90	
Outside Temp (F)	-20	1.062	1.072	1.081	1.090	1.099	1.108	1.117	1.127	1.136	
,	-15	1.056	1.066	1.075	1.084	1.093	1.102	1.111	1.120	1.129	
	-10	1.051	1.060	1.069	1.078	1.087	1.096	1.105	1.114	1.123	
	-5	1.045	1.054	1.063	1.072	1.081	1.090	1.099	1.108	1.117	
	0	1.039	1.048	1.057	1.066	1.075	1.084	1.093	1.102	1.111	
	5	1.033	1.042	1.051	1.060	1.069	1.078	1.087	1.096	1.105	
	10	1.028	1.037	1.046	1.055	1.064	1.072	1.081	1.090	1.099	
	15	1.023	1.031	1.040	1.049	1.058	1.067	1.076	1.084	1.093	
	20	1.017	1.026	1.035	1.044	1.052	1.061	1.070	1.079	1.087	
	25	1.012	1.021	1.029	1.038	1.047	1.056	1.064	1.073	1.082	
	30	1.007	1.015	1.024	1.033	1.041	1.050	1.059	1.067	1.076	
	35	1.002	1.010	1.019	1.028	1.036	1.045	1.054	1.062	1.071	
	40	0.997	1.005	1.014	1.023	1.031	1.040	1.048	1.057	1.065	
	45	0.992	1.000	1.009	1.017	1.026	1.035	1.043	1.051	1.060	
	50	0.987	0.995	1.004	1.012	1.021	1.029	1.038	1.046	1.055	
	55	0.982	0.990	0.999	1.008	1.016	1.024	1.033	1.041	1.050	
	60	0.997	0.986	0.994	1.003	1.011	1.019	1.028	1.036	1.045	
	65	0.973	0.981	0.989	0.998	1.006	1.015	1.023	1.031	1.040	
	70	0.968	0.976	0.985	0.993	1.001	1.010	1.018	1.026	1.035	
	75	0.963	0.972	0.980	0.988	0.997	1.005	1.013	1.022	1.030	
	80	0.959	0.967	0.976	0.984	0.992	1.000	1.009	1.017	1.025	
	85	0.955	0.963	0.971	0.979	0.988	0.996	1.004	1.012	1.020	
	90	0.950	0.958	0.967	0.975	0.983	0.991	0.999	1.008	1.016	
	95	0.946	0.954	0.962	0.970	0.979	0.987	0.995	1.003	1.011	
	100	0.942	0.950	0.958	0.966	0.970	0.982	0.990	0.998	1.007	
	105	0.938	0.946	0.954	0.962	0.970	0.978	0.986	0.994	1.002	
	110	0.933	0.942	0.950	0.952	0.966	0.974	0.982	0.990	0.998	

Table RA3.8-3 Temperature Correction Factors for Depressurization Testing- Calculated according to ASTM E779-10

			Inside Temperature (F)								
			50	55	60	65	70	75	80	85	90
		-20	0.865	0.861	0.857	0.853	0.849	0.845	0.841	0.837	0.833
	*	-15	0.874	0.870	0.866	0.862	0.858	0.854	0.850	0.846	0.842
		-10	0.883	0.879	0.874	0.870	0.866	0.862	0.858	0.854	0.850
	a'0'	-5	0.892	0.887	0.883	0.879	0.875	0.871	0.867	0.863	0.859
	A	0 _	0.900	0.896	0.892	0.887	0.883	0.879	0.875	0.871	0.867
		5	0.909	0.905	0.900	0.896	0.892	0.888	0.883	0.879	0.875
		10	0.918	0.913	0.909	0.905	0.900	0.896	0.892	0.888	0.884
C (15	0.927	0.922	0.918	0.913	0.909	0.905	0.900	0.896	0.892
~~		20	0.935	0.931	0.926	0.922	09.17	0.913	0.909	0.905	0.900
· (C)	ormai	25	0.944	0.939	0.935	0.930	0.926	0.922	0.917	0.913	0.909
For III.		30	0.952	0.948	0.943	0.939	0.934	0.930	0.926	0.921	0.917
4	10	35	0.961	0.956	0.952	0.947	0.943	0.938	0.934	0.930	0.926
40	Outside Temp (F)	40	0.970	0.965	0.960	0.956	0.951	0.947	0.942	0.938	0.934
6.0		45	0.978	0.974	0.961	0.964	0.960	0.955	0.951	0.946	0.942
		50	0.987	0.982	0.977	0.973	0.968	0.963	0.959	0.955	0.950
		55	0.995	0.990	0.986	0.981	0.976	0.972	0.967	0.963	0.958
101.		60	1.004	0.999	0.994	0.998	0.985	0.980	0.976	0.971	0.967
		65	1.012	1.008	1.003	0.998	0.993	0.988	0.984	0.979	0.975
		70	1.021	1.016	1.011	1.006	1.001	0.997	0.992	0.988	0.983
O,		75	1.029	1.024	1.019	1.015	1.010	1.005	1.000	0.996	0.991
		80	1.038	1.033	1.028	1.023	1.018	1.013	1.009	1.004	0.999
		85	1.046	1.041	1.036	1.031	1.026	1.022	1.017	1.012	1.008
		90	1.055	1.050	1.045	1.040	1.035	1.030	1.025	1.020	1.016
	<u> </u>	95	1.063	1.058	1.053	1.048	1.043	1.038	1.033	1.028	1.024
	<u> </u>	100	1.072	1.066	1.061	1.056	1.051	1.046	1.041	1.037	1.032
		105	1.080	1.075	1.070	1.064	1.059	1.054	1.050	1.045	1.040
		110	1.088	1.083	1.078	1.073	1.068	1.063	1.058	1.053	1.048

^{3.} This field is automatically calculated. The Corrected CFM50 is the Nominal CFM50 from Section C multiplied by the Altitude and Temperature Correction Factors.

(Page 3 of 3)

Section E. Accuracy Adjustment (If Row C.2 = No)

- 1. This field is automatically calculated. It is the standard deviation of the Nominal CFM50 values from the 5 to 9 repeated single point tests.
- 2. This field is automatically calculated. It is the Percent Uncertainty and the equation used to calculate this value in the field equals {[(C.1/square root N or the number of tests)x t-statistic look up from table RA 3.8-1]/D.3 Corrected CFM50} = Percent Uncertainty.

Table 3.8-1 Precision Uncertainty: Values of t-statistic

Number of Readings	t-statistic
5	2.78
6	2.57
7	2.45
8	2.37
9	2.31

- This field is automatically calculated. The equation used to calculate this value in the field equals:
 - a. If the Percent Uncertainty in E.2 ≤ 10, then enter "standard" as accuracy level in box E. 3
 - b. If the Percent Uncertainty in E.2 > 10, then enter "reduced" as accuracy level in box E. 3
- 4. This field is automatically calculated. The equation used to calculate this value in the field equals:
 - a. If the Accuracy Level E.3 = Standard, then enter 1 as Accuracy Adjustment Factor in box E.4
 - b. If the Accuracy Level E.3 = Reduced, Accuracy Adjustment Factor equation equals 1+(E.2/100)
- 5. This field is automatically calculated. The equation used to calculate this value in the field equals the D.3 * E.4 = Adjusted CFM50

Section E. Accuracy Adjustment (If Row C.2 = Yes)

- 6. Enter the Corrected CFM50 from manometer software.
- 7. Enter the Percent Uncertainty from manometer software.

Section F. Compliance Statement

1. This field is automatically calculated. 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.
- This statement must be true (or not applicable) for the test to conform to the protocols.
- 3. This statement must be true (or not applicable) for the test to conform to the protocols.
- 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.

CERTIFICATE OF VERIFICATION – DATA FIELD DEFINITIONS AND CALCULATIONS	CF3R-ENV-20-H
Building Leakage Diagnostic Test – ENV-20e	(Page 1 of 3)

A. Bu	A. Building Air Leakage – General Information					
01	Test Procedure Used	< <user down="" input,="" list:<="" p="" pull=""> Single-Point Test with Manual Meter – Display ENV-20a below; Single-Point Test with Automatic Meter – Display ENV-20b below; Multi-Point Test – Display ENV-20c below; Repeated Single Point with Manual Meter – Display ENV-20d below; Repeated Single Point with Automatic Meter – Display ENV-20e below</user>				
02	Building Air Leakage Target from CF1R	< <number cf1r="" from="" pulled="">></number>				
03	Indoor Temperature During Test (°F)	< <user degf="" input,="">></user>				
04	Outdoor Temperature During Test (°F)	< <user degf="" input,="">></user>				
05	Blower Door Location	< <user 50="" characters="" input,="" maximum="" text,="">></user>				
06	Building Elevation (ft)	< <user ft="" input,="">></user>				
07	Building Volume (ft ³)	< <pul><<pull cf1r="" from="">></pull></pul>				
08	Date of the Diagnostic Test for this Dwelling	< <user (use="" control)="" date="" format="" input:="" validation="">></user>				

B. Diagnostic Equipment In	formation			110		- X/	
01 Number of Manometers Used to Measure Home Pressurization <user input,="" integer="">> For entries >1, duplicate lines B. 2-6</user>							
02	03	0-	4 05		70	06	
Manometer Make	Manometer Model	Manor Ser Num	ial	Manometer Calibration Date		Manometer Calibration Status	
< <user <<user="" input,="" td="" text,="" text,<=""><td>put, text, characters>></td><td><<user (d<br="" input,="" text="">maximum 50 charact</user></td><td></td><td><calculated "warning="" -="" 12="" 5="" 8,="" a="" a.="" b.="" building="" calibration="" comply="" current="" date="" diagnostic="" display="" else="" expired.="" field:="" if="" in="" is="" leakage="" manometer="" message:="" months="" of="" order="" required="" test="" test"="" the="" then="" this="" to="" valid";="" with="" within="">>></calculated></td></user>			put, text, characters>>	< <user (d<br="" input,="" text="">maximum 50 charact</user>		<calculated "warning="" -="" 12="" 5="" 8,="" a="" a.="" b.="" building="" calibration="" comply="" current="" date="" diagnostic="" display="" else="" expired.="" field:="" if="" in="" is="" leakage="" manometer="" message:="" months="" of="" order="" required="" test="" test"="" the="" then="" this="" to="" valid";="" with="" within="">>></calculated>	
07 Number of Fans Used t	to Pressurize Home	< <user input,="" integer="">> For entries >1, do</user>		1, dupli	cate lines B. 8-11		
08	09	09		10		11	
Fan Make	Fan Mod	lel	Fan Serial Number		Fa	Fan Configuration (rings)	
< <user characters="" input,="" maximum="" text,="">></user>	, , ,	input, text, maximum 50 characters>>		t, text, maximum 50 aracters>>	< <use< td=""><td>er input, text, maximum 50 characters>></td></use<>	er input, text, maximum 50 characters>>	
4414							

ENV20e – Repeated Single Point Air Tightness Test With Automatic Meter

C. En	C. Envelope Leakage Diagnostic Test - ENV20e						
01	Time Average Period of Meter	<user 10,="" be="" but="" entry="" in="" less="" must="" no="" second="" than="">></user>					
02	Blower Door Software Used for Calculations?	<quser "no"="" "yes"="" are="" choices="" entry,="" or=""></quser>					
	03	04					
	Induced Building Pressure	Nominal CFM50					
<< required data>> (Resolution of 0.1 Pa)		<< required data>> (Resolution of 1 CFM)					
<< required data>> (Resolution of 0.1 Pa)		<< required data>> (Resolution of 1 CFM)					
<< red	quired data>> (Resolution of 0.1 Pa)	<< required data>> (Resolution of 1 CFM)					
<< red	quired data>> (Resolution of 0.1 Pa)	<< required data>> (Resolution of 1 CFM)					
<< red	quired data>> (Resolution of 0.1 Pa)	<< required data>> (Resolution of 1 CFM)					
<< 6-9 optional data>> (Resolution of 0.1 Pa)		<< 6-9 optional data>> (Resolution of 1 CFM)					
05	Average Nominal CFM50	< <calculated value,="<math">(C.4_1+C.4_2+C.4_3+C.4_4+C.4_5+C.4_6+C.4_7+C.4_8+C.4_9)/N (N equals the number of tests)>></calculated>					

D. Alt	itude and Temperature Correction	10000
< <if ro<="" th=""><th>ow C. 2 = "no", use this section>></th><th></th></if>	ow C. 2 = "no", use this section>>	
		< <calculated if<="" td="" value,=""></calculated>
01	Altitude Correction Factor	row A. 6 ≤ 5000 Ft = 1;
		row A. 6 > 5000 =, 1 + .000006 * row A. 6
02	Tamananatura Carrantian Factor	<pre><<from and="" look="" possible="" pre="" ra3.8-2="" ra3.8-3,="" tables="" up?<=""></from></pre>
02	Temperature Correction Factor	showing both input and output for user to double check>>
03	Course the d CENATO	< <calculated *="" 1="" 5*altitude="" c.="" correction="" d.="" row="" td="" temperature<="" value,=""></calculated>
	Corrected CFM50	correction D. 2>>

E. Ac	curacy Adjustment	617					
< <if rc<="" td=""><td colspan="7"><<if ,="" 2="no" c.="" row="" section="" this="" use="">></if></td></if>	< <if ,="" 2="no" c.="" row="" section="" this="" use="">></if>						
01	Standard Deviation of Nominal CFM 50 Values Above	< <calculated, c.4<sub="" equals="" of="" root="" square="" the="" {[(c.5-="">1)^2+(C.5- C.4₂)^2+(C.5- C.4₃)^2+(C.5- C.4₄)^2+(C.5- C.4₅)^2+(C.5- C.4₆)^2+(C.5- C.4₇)^2+(C.5- C.4₈)^2+(C.5- C.4₉)^2]/N-1 (N equals the number of tests)>></calculated,>					
02	Percent Uncertainty	<calculated, (n="" *="" 1="" 3.8-1}=""]="" c.="" cfm50="" corrected="" dev="" equals="" look="" number="" of="" ra="" sqrt(n)="" std="" table="" tests)="" the="" up="" {[="">></calculated,>					
03	Accuracy Level	< <calculated, "standard";="" %="" if="" uncertainty="" ≤10,=""> 10, "Reduced">></calculated,>					
04	Accuracy Adjustment Factor	<calculated, "reduced",="" "standard"="1;" (%="" 1+="" 100)="" 3="" e.="" if="" is="" it="" row="" uncertainty="">></calculated,>					
05	Adjusted CFM50 (measured air leakage rate)	< <calculated, *="" 3="" 4="" d.="" e.="" row="">></calculated,>					
< <if ro<="" td=""><td colspan="6"><<iif ,="" 2="yes" c.="" lines="" next="" row="" two="" use="">></iif></td></if>	< <iif ,="" 2="yes" c.="" lines="" next="" row="" two="" use="">></iif>						
06	Corrected CFM50 (from software)	< <user by="" calculated="" entry="" of="" software="" value="">></user>					
07	Percent Uncertainty @ 95% Confidence Level (from software)	< <user by="" calculated="" entry="" of="" software="" value="">></user>					

F. Compliance Statement

01

<< if manometer Calibration Date in B. 5 is within 12 months of the date of the diagnostic test A. 8 and if Adjusted CFM50 Leakage in E. 5 or if corrected CFM50 Leakage in E. 6 is less than or equal to the Building Air Leakage Rate Target in A. 2 then display text: "Building Passes Envelope Leakage Test"; if manometer Calibration Date in B. 5 is more than 12 months from the date of the diagnostic test A. 8 or if Adjusted CFM50 Leakage in E. 5 or if corrected CFM50 Leakage in E. 6 is more than the Building Air Leakage Rate Target in A. 2 then display text: "Building Fails Envelope Leakage Test">>>

CERTIFICATE OF VERIFICATION – DATA FIELD DEFINITIONS AND CALCULATIONS	CF3R-ENV-20-H
Building Leakage Diagnostic Test – ENV-20e	(Page 3 of 3)

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:	<pre><<user ***="" -="" a="" all="" applicable="" applicable<="" are="" below;="" corrections="" enter="" entire="" fail="" failure="" field="" for="" from="" in="" is="" list:="" met.="" met;="" more="" n="" not="" notes="" one="" or="" pass="" pick="" pre="" reason="" requirements="" table="" this=""></user></pre>
07	Correction Notes:	< <if <u="">Verification Status= <u>Fail</u>, then text entry in this Corrections Notes field is required; user input text>></if>

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.

< | <<if B. 6 = Manometer Calibration is valid; and F. 1 = Building Passes Envelope Leakage Test; and G. 6 = Pass or All n/a; then display: Complies: All specified verification protocol requirements on this document are met; else display: Does not comply: One or more specified verification protocol requirements on this document are not met.>>