

# One in Thirty

## Third Party Quality Control Program

**APPROVED  
BY THE CEC  
MARCH 2006**



### Step by Step Guide to Title 24 Compliance



**Save Time, Increase Revenue, Encourage Compliance.**

The following information provides a step by step process to assist building departments, and other interested parties, in understanding the Title 24 process for Alterations, done by Third Party Quality Control Program contractors and installers that require field verification and diagnostic testing under the 2005 Building Energy Efficiency Standards.

 **enalysis**

California Building Performance  
Contractors Association  
**cbpca**

# One in Thirty

## Third Party Quality Control Program

This document is to inform you that the CF-6R, when submitted by a Third Party Quality Control Program Contractor, allows Building Officials to close the permit for these jobs. Also, in this document, we have described the authority given to the CBPCA, as an approved HERS Provider with a Third Party Quality Control Program, to enforce the requirement “that if sampling indicates that re-sampling, full testing and corrective action is necessary, such work shall be completed.” This assures the building department that jobs closed with the CF-6R and that are found to require corrective action will in fact be corrected.

The following information provides a step by step process to assist building departments, and other interested parties, in understanding the Title 24 process for Alterations, done by Third Party Quality Control Program contractors and installers that require field verification and diagnostic testing under the 2005 Building Energy Efficiency Standards.

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## Step by Step Guide to Title 24 Compliance

**1** The Contractor gets a Title 24 job with one (or more) measure(s) that require field verification and diagnostic testing per Title 24.

**2** The Contractor/Installer fills out, either on the Enalasy platform or by hand, the form CF1-RA for Change Outs. [ 1 ]

**3** The Contractor pulls a building permit, as required by law. *(This can be done via the eOne Platform™, provided at no charge, for building departments participating in the Enalasy automated permitting process.)*

**4** The Contractor does the job using Enalasy diagnostic testing equipment and then performs a “test out” for verification of the measurements that indicates that the job meets compliance by using the Enalasy tamper-proof equipment. The data from sensors is sent wirelessly to the contractor/technician’s laptop where industry approved algorithms calculate the duct leakage and/or the refrigerant charge and airflow and provides real-time reports/feedback to the contractor/technician to guide them in meeting the CEC approved targets. The contractor/technician cannot change the measurements from the sensors or the calculated results performed by the laptop algorithms.

**Please note** that some HERS Raters, who are not part of the Third Party Quality Control Program, are claiming that the contractors are testing their own work. That is indeed the fact; They Are. However, they **are not verifying** via the CF-4R that the job is correct and meets the requirements of Title 24. This is the sole responsibility of Certified CBPCA HERS Raters.

[ 1 ] See (b) Alterations in Section 152 of the Building Energy Efficiency Standards.



**5** The Contractor/Installer uploads the test results and data to the Enalaysis eOne Platform™.

**6** The measurements, chronological tracking, and other quality assurance testing, to detect gaming, is performed and, if determined to be correct and meeting the CEC compliance requirement, the Form CF-6R is then automatically produced by auto-filling the required fields on the CF-6R for the measures requiring testing and field verification.

**7** A CF-6R is printed and posted at the job site. [ 2 ] The following language is on the bottom of the CF-6R. Here is an example of the bottom of a CF-6R.



[ 2 ] Note: Form CF-6R CANNOT be printed unless all of the testing passes the required specifications.

Installing Subcontractor (Co. Name) OR General Contractor (Co. Name) OR Owner	Enalaysis / 1st Test
Signature:	Date: 10/01/07
Copies to: BUILDING DEPARTMENT, HERS RATER (IF APPLICABLE) BUILDING OWNER AT OCCUPANCY.	
<p><i>Residential Compliance Forms</i> This form has been created by a state-certified Third Party Quality Control Program. A CF-6R is allowed by the CEC to close the permit as per 2005 Residential ACM Manual, section 7.7.</p>	



[ 3 ] See page 7-7 of the 2005 Res ACM Manual.

The previous block in Yellow reads: This CF-6R was automatically created by a Third Party Quality Control Contractor using wireless sensors for tamper proof data checking and documents that the dwelling unit complies. Therefore, the building official may approve the compliance and close the building permit. [ 3 ] This information block was provided to assist building officials to identify CF-6Rs for the Third Party Quality Control Program that qualify for permit closure.

## 7 continued

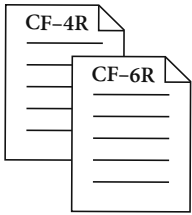
**Note:** For building officials who cannot find information about HERS Required Field Verification and Diagnostic Testing and/or the Third Party Quality Control Program in their Building Energy Standards or the Compliance Manuals, here is the link to the Residential 2005 ACM Manual at the CEC's website:

[http://www.energy.ca.gov/title24/2005standards/residential\\_acm/2005\\_RES\\_ACM\\_CHAPT7.PDF](http://www.energy.ca.gov/title24/2005standards/residential_acm/2005_RES_ACM_CHAPT7.PDF)

If this CF-6R is the first of a new sample group, the Enalaysys eOne Platform™ assigns a CBPCA HERS Rater to the sample group [ 4 ] and sends the building department by mail or email a copy of the CF-6R and instructions on how to access the CF-6R on the CBPCA's Registry database of Title 24 jobs.

Each building department has access on the Enalaysys Platform to their own dedicated site for all jobs that are done using the Enalaysys Third Party Quality Control Program. Building departments can choose to print, download and store the job(s) information on their database, or use their own dedicated space on the Enalaysys Platform as their database.

[ 4 ] See Section 7.6 of the Res ACM Manual)



[ 5 ] See Section 7.7 of the Res ACM Manual.

## 8 PLEASE NOTE THIS VERY IMPORTANT STEP:

“When a Third Party Quality Control Program is used, the CF-6R shall document that data checking has indicated that the dwelling unit complies. The building official may approve compliance based on the CF-6R on the condition that if sampling indicates that re-sampling, full testing and corrective action is necessary, such work shall be completed.” [ 5 ]

To assure that a Third Party Quality Control contractor that fails the first sampling and second sampling performed by a CBPCA rater, the Energy Commission authorized, directed and required, under Title 20 and 24, the CBPCA as the HERS Provider to maintain quality control over field verification and diagnostic testing ratings.

Additionally the Third Party Quality Control contractors enter into a three-way contract with the CBPCA, as the HERS Provider, and Enalays, as the TPQC Program Provider, to comply with all Local, State, and Federal laws and regulations that are required as part of this Program. Hence, when the building department closes the permit with the CF-6R, the CBPCA and Enalays are required by law to enforce and ensure that any and all of the jobs, that are a part of a failed group, are redone by the installing contractor.

***Please note that many building departments are currently accepting the CF-6R to close the permit.***

They conduct their health and safety inspection and then **the HERS Rater does the required energy compliance field verification(s)**. This is done after the sample group is populated with 30 jobs or before the 6 month term ends for the first CF-6R of the sample group.

The HERS providers and raters shall be considered ***special inspectors by building departments***, and shall demonstrate competence, to the satisfaction of the building official, for the visual inspections and diagnostic testing. [ 6 ]

[ 6 ] See 2005 Residential ACM Manual, Chapter 7, 7.1 on page 7-1.

**9** A CBPCA's HERS Rater field tests a randomly selected one in thirty job. (*We (the CBPCA) encourage our Raters to invite the building official to join the Rater in observing the testing in order to help meet the code requirement as described in the previous paragraph.*) Upon passing the required test(s) the rater then verifies this by marking the check box under the HERS RATER COMPLIANCE STATEMENT "*The house was: Tested.*" The CBPCA then notifies, either by mail or email, the building department that the tested job from the sample group has passed. The building department can access the results of the HERS Rater's test on the CBPCA's database and if needed can either print out the results or download the information to be stored on their own database.

**Please Note:** If the one in thirty does not pass, a second job will be randomly selected from the group of thirty and tested. If it passes, the rest of the group passes. If it does not pass, the following procedure applies.

"When re-sampling reveals a failure, builders/contractors shall offer, at no charge to building owners in occupied dwelling units in the group, to complete field verification, testing and corrective action if necessary. Building owners may decline to have field verification and testing and corrective action completed. Builders/contractors shall report the identify-



ing location of any dwelling unit in which the building owner declines field verification and testing and corrective action to the HERS provider. Builders/contractors shall take corrective action as required in all unoccupied dwelling units in the group and in occupied dwelling units in the group where building owners have accepted field verification, testing and corrective action.” [ 7 ]

[ 7 ] See the 2005 Res ACM Manual, Chapter 7, 7.1 on page 7-1.

## **7. Home Energy Rating Systems (HERS) Required Field Verification and Diagnostic Testing**

### **7.1. California Home Energy Rating Systems**

Compliance credit for particular energy efficiency measures, which the Commission specifies, requires field verification and diagnostic testing of as-constructed dwelling units (as defined in Section 7.9) by a certified HERS (Home Energy Rating System) rater. The Commission approves HERS providers, subject to the Commission's HERS regulations, which appear in the California Code of Regulations, Title 20, Division 2, Chapter 4, Article 8, Sections 1670-1675. Approved HERS providers are authorized to certify HERS raters and maintain quality control over field verification and diagnostic testing ratings.

When compliance documentation indicates field verification and diagnostic testing of specific energy efficiency measures as a condition for complying with Title 24, Part 6, and an approved HERS provider and certified HERS rater shall be used to conduct the field verification and diagnostic testing. HERS providers and raters shall be considered special inspectors by building departments, and shall demonstrate competence, to the satisfaction of the building official, for the visual inspections and diagnostic testing. The HERS provider and rater shall be independent entities from the builder or subcontractor installer of the energy efficiency improvements being tested and verified, and shall have no financial interest in the installation of the improvements. Third Party Quality Control Programs approved by the Commission may serve the function of HERS raters for field verification purposes as specified in Section 7.6.

## **7.2. Measures Required Field Verification and Diagnostic Testing**

Table R7-1 describes the measures that require installer certification and HERS rater field verification and diagnostic testing, and identifies the protocol or test procedure in the appendices that shall be used for completing installer and HERS rater diagnostic testing and HERS rater field verification.

See the next page for Table R7-1.

## **7.6 Third Party Quality Control Programs**

The Commission may approve Third Party Quality Control Programs that serve the function of HERS raters for field verification purposes. Third Party Quality Control Programs shall provide training to installers regarding compliance requirements for measures for which diagnostic testing and field verification is required. Third Party Quality Control Programs shall collect data from participating installers for each installation completed for compliance credit, complete data checking analysis to evaluate the validity and accuracy of the data to independently determine whether compliance has been achieved, provide direction to the installer to retest and correct problems when data checking determines that compliance has not been achieved, require re-submission of data when retesting and correction is directed, and maintain a database of all data submitted by installers in a format that is acceptable to the Commission and available to the Commission upon request. The data that is collected by the Third Party Quality Control Program shall be more detailed than the data required for showing compliance with the Standards, shall provide an independent check on the validity and accuracy of the installer's claim that compliance has been achieved, and shall not be

Table R7-1 – Summary of Measures Requiring Field Verification and Diagnostic Testing

Measure Title	Description	Protocol or Test Procedure
<b>Duct Measures</b>		
Duct Sealing	Package D requires that space conditioning ducts be sealed. If sealed and tested ducts are claimed in the proposed design ACM calculation, diagnostic testing is required to verify that leakage is less than the specified criteria.	ACM Appendix RC-2005
Supply Duct Location, Surface Area and R-factor	If compliance credit is claimed for improved supply duct location, surface area and R-value, field verification is required to verify that duct system was installed according to the design, including location, size and length of ducts, duct insulation R-value and installation of buried ducts. <sup>1</sup>	ACM Appendix RC-2005
<b>Air Conditioner Measures</b>		
Improved Refrigerant Charge	Package D requires in some climate zones that split system air conditioners and heat pumps be diagnostically tested in the field to verify that they have the correct refrigerant charge (see Section 4.7.3). The Proposed Design is modeled with less efficiency if diagnostic testing and field verification is not performed.	ACM Appendix RD-2005
Installation of Thermostatic Expansion Valve (TXV)	A TXV may be installed as an alternative to refrigerant charge testing. The existence of a TXV has the same calculated benefit as refrigerant charge testing and requires field verification.	ACM Appendix R8-2005
Adequate Air Flow	Air conditioner efficiency requires adequate airflow across the evaporator coil. Compliance credit may be taken when airflow is higher than the criteria specified	ACM Appendix RE-2005
Air Handler Fan Watt Draw	If compliance credit is taken for reductions in fan power, the installed fan power shall be diagnostically tested and verified in the field.	ACM Appendix RE-2005
High Energy Efficiency Ratio (EER)	Compliance credit may be taken for increases in EER by installation of specific air conditioner or heat pump models, but only if the installation of that high EER model is field verified.	ACM Appendix R8-2005
Maximum Cooling Capacity	An additional compliance credit may be taken when the requirements for the combination of adequate air flow, duct sealing and Improved refrigerant charge are met and air conditioners are sized according to the ACM calculations. Field verification is required.	ACM Appendix RF-2005
<b>Building Envelope Measures</b>		
Building Envelope Sealing	The default building envelope specific leakage area (SLA) is specified in Section 4.5.1. Compliance credit may be taken for improved building envelope sealing, but only if lower SLA values are field verified through diagnostic testing.	ASTM E779-03
High Quality Insulation Installation	ACMs recognize Standard and improved envelope construction. Compliance credit for improved envelope construction requires field verification.	ACM Appendix RH-2005

1. Note: Compliance credit for increased duct insulation R-value (not buried ducts) may be taken without field verification if the R-value is the same throughout the building, and for supply ducts located in crawlspaces and garages where all supply registers are either in the floor or within 2 feet of the floor. These two credits may be taken subject only to building department inspection.

2. Note: The requirement for verification of a high EER does not apply to equipment rated only with an EER.

All features that require verification and/or testing shall be listed in the *Field Verification and Diagnostic Testing* section of on the *Certificate of Compliance* (CF-1R). The listing shall include "eligibility and installation criteria" for such features. Field verified and diagnostically tested features shall be described in the *Compliance Supplement*. Installers shall certify that the requirements for compliance have been met on

alterable by the installer to indicate that compliance has been achieved when in fact compliance has not been achieved.

The Third Party Quality Control Program shall also obtain the services of a HERS rater to conduct independent field verifications, completing all of the responsibilities of a HERS rater as specified in this Chapter with the exception that sampling shall be completed for a group of up to thirty dwelling units with a minimum sample of one out of every thirty sequentially completed dwelling units from the group. The HERS rater shall be an independent entity from the Third Party Quality Control Program. Re-sampling, Full Testing and Corrective Action shall be completed as specified in section 7.5.3 with the exception that re-sampling shall be completed for a minimum of one out of every thirty dwelling units from the group.

The Third Party Quality Control Program shall meet all of the requirements of a HERS rater specified in the Commission's HERS Program regulations (California Code of Regulations, Title 20, Division 2, Chapter 4, Article 8, Sections 1670 -1675), including the requirement to be an independent entity from the builder and the HERS rater that provides independent field verifications, subcontractor installer as specified by section 1673(i). A Third Party Quality Control Program may have business relationships with installers participating in the Program to advocate or promote the Program and an installer's participation in the Program, and to advocate or promote products that the Third Party Quality Control Program sells to installers as part of the Program.

Prior to approval by the Commission, the Third Party Quality Control Program shall provide a detailed explanation to the Commission of 1) the data that is to be collected from the installers, 2) the data checking process that will be used to evaluate the validity and accuracy of the data, 3) the justification for why this data checking process will provide strong assurance that the installation actually complies, and 4) the format for the database that will be maintained and provided to the Commission upon

request. The Third Party Quality Control Program may apply for a confidential designation of this information as specified in the Commission's Administrative Regulations (California Code of Regulations, Title 20, Division 2, Chapter 7, Article 2, Section 2505). The Third Party Quality Control Program shall also provide a detailed explanation of the training that will be provided to installers, and the procedures that it will follow to complete independent field verifications.

The Third Party Quality Control Program shall be considered for approval as part of the rating system of a HERS Provider, which is certified as specified in the Commission's HERS Program regulations, Section 1674. A Third Party Quality Control Program can be added to the rating system through the recertification of a certified HERS Provider as specified by Section 1674(d).

### **7.7 Sampling for Additions or Alterations**

When compliance for an addition or alteration requires diagnostic testing and field verification, the building owner may choose for the testing and field verification to be completed for the dwelling unit alone or as part of a sample of dwelling units for which the same installing company has completed work that requires testing and field verification for compliance. The building owner or agent of the building owner shall complete the applicable portions of a Certificate of Compliance (CF-1R). The HERS provider shall define the group for sampling purposes as all dwelling units where the building permit applicant has chosen to have testing and field verification completed as part of a sample for the same installing company. The group shall be no larger than seven. The installing company may request a smaller group for sampling. Whenever the HERS rater for the group is changed, a new group will be established. Initial Field Verification and Testing shall be completed for the first dwelling unit in

each group. Re-sampling, Full Testing and Corrective Action shall be completed if necessary as specified by section 7.5.3.

Field verification may be completed by an approved Third Party Quality Control Program as specified in section 7.6. The group for sampling purposes shall be no larger than thirty when a Third Party Quality Control Program is used. The Third Party Quality Control Program may define the group instead of the Provider. When a Third Party Quality Control Program is used, the CF-6R shall document that data checking has indicated that the dwelling unit complies. The building official may approve compliance based on the CF-6R on the condition that if sampling indicates that re-sampling, full testing and corrective action is necessary, such work shall be completed.

## **7.8 Summary of Responsibilities**

This section summarizes responsibilities described previously in this chapter and organizes them by the responsible party.

### **7.8.1 Builder**

The builder shall make arrangements for the services of a certified HERS rater prior to installation of the measures, so that once the installation is complete the HERS rater has ample time to complete the field verification and diagnostic testing without delaying final approval of occupancy by the building department. Builder employees or subcontractors responsible for completing diagnostic testing, visual inspection or verification as specified in Section 7.4 shall certify the diagnostic testing results and that the work meets the requirements for compliance credit on the CF-6R.

## (HERS) Required Field Verification and Diagnostic Testing

The builder shall provide the HERS rater with the identifying location of the group of dwelling units to be included in the sample for field verification and diagnostic testing. The builder shall provide the HERS provider a copy of the CF-6R signed by the builder employees or sub-contractors certifying that diagnostic testing and installation meet the requirements for compliance credit.

The builder shall provide a Certificate of Field Verification and Diagnostic Testing (CF-4R) signed and dated by the HERS rater to the building official in conjunction with requests for final inspection for each dwelling unit.

When re-sampling reveals a failure, builders shall offer, at no charge to building owners in occupied dwelling units in the group, to complete field verification, testing and corrective action if necessary. Building owners may decline to have field verification and testing and corrective action completed. Builders shall report the identifying location of any dwelling unit in which the building owner declines field verification and testing and corrective action to the HERS provider. Builders shall take corrective action as required in all unoccupied dwelling units in the group and in occupied dwelling units in the group where building owners have accepted field verification, testing and corrective action.





## Additional Resources

### **Title 24 Hotline**

phone: 1-(877)-411-8378

e.mail: [building@enalsys.com](mailto:building@enalsys.com)

### **CEC Residential and Non-Residential Compliance Manuals**

<http://www.energy.ca.gov/title24/>

### **California Energy Commission Energy Standards**

1516 Ninth Street

Sacramento, CA 95814

phone: 1-(916) 654-5106

toll free: 1-(800) 772-3300

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[www.energy.ca.gov/](http://www.energy.ca.gov/)

### **California Building Performance Contractors Association**

*CBPCA is the only providership in California that offers Third Party Quality Control Certification.*

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