

Just the Basics: HERS

For Residential and Nonresidential Projects

What is HERS?

HERS stands for Home Energy Rating System. The program was developed to address poor construction quality and equipment installation. HERS measures cover HVAC systems, ductwork, ventilation, plumbing, and insulation for residential projects, and ductwork for nonresidential projects. In order to verify these measures, certified HERS Raters perform onsite inspections and tests to ensure proper installation and code compliance.

Type of projects requiring HERS verification:

- ★ Residential, multifamily, and nonresidential (newly constructed buildings & additions and alterations)
- ★ New Solar Homes Partnership Program (newly constructed residential buildings)
- ★ Those pursuing a California Whole-House Home Energy Rating

Only certain measures in the 2013 Building Energy Efficiency Standards (Energy Standards) trigger HERS verification. For more information on HERS triggers, see page 2. To determine if any HERS verification measures and forms apply to a specific project or scenario, the [Forms Ace tool](#) is available on Energy Code Ace.

What is a HERS Rater?

A HERS Rater is an individual that has been trained and certified by a HERS Provider to verify compliance of HERS measures with California's Energy Standards. HERS Raters are third party inspectors that perform field verification and diagnostic testing services for the benefit of the homeowner or building owner to ensure proper measure installation and systems operation.

Need to find a HERS Rater in your area? Contact a HERS Provider listed on the [California Energy Commission's HERS Providers page](#). Many HERS Providers have regional search capabilities on their websites.

HERS Providers are third party organizations that are approved by the California Energy Commission (CEC) to train and certify HERS Raters, and conduct quality assurance reviews to maintain consistency among HERS Raters. Providers also maintain a HERS registry, which contains a database of projects and related compliance documents. Each HERS Provider reports registry data to the CEC on an annual basis so the State can benchmark energy savings measures.

What's the difference between a HERS Rater and Building Inspector?

HERS Raters perform inspections and field verification for specific Energy Standards requirements, called HERS measures. These are measures that need more in depth knowledge and usually require special testing equipment to verify the systems installed are working as designed. HERS Raters have been specifically trained and certified to perform this work. HERS Raters are similar to special inspectors and verify compliance on behalf of the building owner. Building Inspectors perform inspections for all Building Codes-Structural, Electrical, Plumbing, etc. during set times throughout construction.

Why should I care about HERS?

As a homeowner or building owner, you should expect your building features to be installed as designed and to code. The HERS verification process ensures that the proposed HERS measures are installed and meet code compliance.

Compliance Documents

There are several documents that the Building Department will need to verify code compliance. These documents are called Compliance Documents. There are three types of documents that are required at different stages of construction. These include:

- ★ **Certificate of Compliance (NRCC or CF1R):** Completed by designer, energy consultant, installing contractor or sometimes the owner
- ★ **Certificate of Installation (NRCI or CF2R):** Completed by the installing contractor
- ★ **Certificate of HERS Verification (NRCV or CF3R):** Completed by the HERS Rater

The [residential compliance documents](#) and the [nonresidential compliance documents](#) are located on the CEC's website.

**As a building owner or homeowner, the compliance documents are yours to keep. These documents are designed to ensure that the installed energy efficient measures are in compliance with California's Energy Standards and should be passed along with the building's ownership.

How do I register compliance documents?

Registering compliance documentation is a process designed to ensure that measures are installed in accordance with the Energy Standards requirements listed on the Certificate of Compliance. The Building Department will require a registered CF1R before issuing a permit if HERS measures are required. For nonresidential projects, the NRCC is not required to be registered, only the HERS forms (NRCV) are required to be registered.

- ★ For new construction and additions, the registration process is generally initiated by the energy consultant or compliance documentation author. This process will require the owner or contractor to establish an account with the HERS Provider in order to "sign-off" or approve the documentation before a registered CF1R may be printed. This is an important step in the process and should be completed to prevent delays in registration.
- ★ The compliance documentation for alterations is generally initiated by the installing contractor and does not require the owner to sign-off.

To establish an account with a HERS Provider, go to a provider's website and follow their directions based on your role (home owner, contractor or architect/designer). For security purposes, this process will require you to provide personal identification. Once your account is established, you will have access to either create or sign-off on a project, whichever is applicable.

What do I do after my compliance documents are approved in the HERS Registry?

Once the compliance documents have been approved and signed-off by all responsible parties, they are ready to be printed and submitted to the Building Department. The registered compliance documents will contain a unique registration number, date and time stamp, and name of HERS Provider at the bottom of each page. This tells the Building Department that the documents are registered. If any changes occur to the scope of work, then the CF1R will need to be revised, registered, and re-submitted to the Building Department for approval.

When do I need to hire a HERS Rater?

A homeowner or installing contractor will need to hire a HERS Rater whenever the CF1R or NRCC requires HERS measures. Typically a HERS Rater should be selected at the beginning of construction so they can inform the contractor about when they need to perform inspections and testing.

For new construction and additions, it is important to coordinate with the energy consultant or documentation author when assigning a Rater to the project. This allows the Rater to have access to the registered compliance documentation associated with the project. This is also the case with alterations, but typically the installing contractor will assign the Rater to the project. The cost of HERS Raters varies depending on the HERS measure.

Whole-House Home Energy Rating

A whole-house home energy rating is a way for homeowners to compare the energy usage of their home to other similar homes and identify additional ways to reduce energy. This rating is performed through a series of energy audits or evaluations. The initial audit assesses the building and identifies potential energy efficiency improvements. It identifies a path for the owner to improve the efficiency of their property.

Once the improvements have been completed, a Whole-House Home Energy Rating is done on the home. This rating lets homeowners know how their home compares to others and provides an official certificate that shows their energy score on a specific statewide scale.

It is of particular interest if you are considering the sale of your home since the rating will convey the home's relative energy efficiency. A trained and certified HERS Rater can perform the audit and provide the report for a Whole-House Home Energy Rating. For more information, see [approved HERS Providers](#) websites or download the CEC's [Home Energy Rating System Booklet](#).

Residential Mandatory HERS Measures

If your project involves one of the following features, you will likely trigger mandatory HERS verification measures.

New homes or additions greater than 1,000 SF

- ✦ Triggers the indoor air quality (IAQ) ventilation measure, which requires the installation of a mechanical ventilation system that complies with the airflow rate required by ASHRAE Standard 62.2. A HERS Rater would use airflow measurement tools to verify compliance.

New or altered central HVAC systems or altered/extended ductwork more than 40ft

- ✦ Triggers duct leakage testing to verify minimal duct leakage (<6% for new systems and <15% for altered). This measure ensures your cooling and heating systems are efficiently transferring air to conditioned spaces. This is the most common HERS measure.

New HVAC system or replacing existing HVAC systems with all new equipment and all new ductwork

- ✦ Triggers air flow and fan watt draw measures, to verify an improved airflow rate of 350 cfm/ton in forced air systems and a reduced fan power draw to 0.58 Watt/cfm. These tests verify motor efficacy and that the duct system has low air flow resistance.

Residential Prescriptive HERS Measures

If your project is using the prescriptive method and involves one of the following features, you will likely trigger HERS verifications.

New HVAC systems with AC or altered AC systems in Climate Zone 2, 8-15 (find Climate Zone by zip code or area [here](#))

- ✦ Triggers refrigerant charge testing to verify correct refrigerant charge. This will assure proper refrigerant charge of your AC unit.

New ducts in conditioned space

- ✦ Triggers visual inspection of duct location and duct testing to verify low leakage to the outside. Ducts that are in conditioned space do not require insulation.

Using a central forced air unit (FAU) for mechanical ventilation (central fan integrated ventilation)

- ✦ Triggers fan watt draw and airflow testing similar to the mandatory measure process.

Using a zonally controlled forced air unit (FAU), bypass cannot be used

- ✦ Triggers visual inspection to confirm that the bypass ducts are not used. Bypass ducts can send heated or cooled air back into the space conditioning equipment, which can cause problems and reduce efficiency.

Residential Performance HERS Measures

If your project is utilizing the Performance approach to demonstrate compliance, you will likely need an energy consultant or Certified Energy Analyst (CEA) to analyze the project and complete the compliance documentation. See the [CABEC website](#) for more information on where to find a CEA. Common performance measures that require HERS verification include:

- ✦ Quality Insulation Installation (QII)
- ✦ Reduced Building Air Leakage
- ✦ Refrigerant charge testing
- ✦ Ducts in conditioned space
- ✦ High SEER/EER
- ✦ Verified hot water pipe insulation and parallel piping

Nonresidential HERS Measures

Nonresidential HERS measures are summarized on the Energy Code Ace Quick Reference Sheet for Nonresidential HERS Measures. This resource can be found on the Fact Sheet page on www.EnergyCodeAce.com.

HVAC Definitions

Entirely New System: All system heating/cooling equipment is replaced and $\geq 75\%$ of the duct material is new.

Altered or Replaced Ducts: When $\geq 75\%$ of the duct system is new or replaced. Existing duct system components (up to 25%) can be reused if they are accessible and can be sealed. Replacement or extension of ductwork over 40 feet is also within this category.

Altered Systems: A system altered by installing or replacing a cooling coil, condenser unit, compressor, refrigerant piping, refrigerant metering device, air handler, or heat exchanger. Replacing other components is considered a repair and not subject to code compliance.

