
4.8 Compliance and Enforcement

This section describes compliance documentation and field verification requirements related to heating and cooling systems.

4.8.1 Design-Phase Documentation

The initial compliance documentation consists of the certificate of compliance (CF1R). It lists the features that the house needs for it to comply with the prescriptive or performance requirements, depending on the compliance path taken.

Mandatory features as required by §150.0 are not documented on any required compliance forms. They are, however, listed in a Mandatory Features Checklist provided in Appendix A that enforcement personnel can use as a compliance tool, if they choose.

For the prescriptive compliance approach, the required features are based on Prescriptive Component Package A, shown in Table 150.1-A.

For the performance compliance approach, the required features are based on a set of features that the designer has documented to result in a level of efficiency at least as good as Prescriptive Component Package A. The calculations for documenting this are done using the approved performance software, the algorithm of which is detailed in the *Alternative Calculation Method (ACM) Manual*.

The performance approach provides maximum design flexibility. It also allows the compliance credit for special, additional features to be quantified.

The CF1R has a section where special modeling features are listed. These are features for which special compliance credit was taken using the performance approach. They required additional visual verification by the enforcement agency to ensure proper installation. Some require field verification and diagnostic testing by a HERS Rater. These will be listed in a separate section.

The following are heating and cooling system features that will be listed in this section if they exist in the proposed design:

Special Features Not Requiring HERS Rater Verification:

1. Ducts in a basement
2. Ducts in a crawlspace
3. Ducts in an attic with a radiant barrier
4. Hydronic heating and system design details
5. Gas-fired absorption cooling
6. Zonal control
7. Ductless wall heaters

Special Features Requiring HERS Rater Verification:

1. Duct sealing
2. Verified duct design – for reduced duct surface area and ducts in conditioned space
3. Low-leakage ducts in conditioned space
4. Low -leakage air handlers
5. Verification of return duct design
6. Verification of air filter device design
7. Verification of bypass duct prohibition
8. Refrigerant charge
9. Installation of a fault indicator display (FID)
10. Verified system airflow
11. Air handler fan watt draw
12. High energy efficiency ratio (EER)
13. Verified seasonal energy efficiency ratio (SEER)
14. Maximum-rated total cooling capacity
15. Evaporative cooled condensers
16. Ice storage air conditioners
17. Continuous whole-building mechanical ventilation airflow
18. Intermittent whole-building mechanical ventilation airflow
19. High-quality insulation installation (QII)

Information summarizing measures requiring field verification and diagnostic testing is presented in Table RA2-1 of the Reference Residential Appendix RA2. The field verification and diagnostic testing protocols that must be followed to qualify for compliance credit are described in RA3 of the Reference Residential Appendix.

Registration of the CF1R with an approved HERS Provider is required. The building owner or the person responsible for the design must submit the CF1R to the HERS Provider Data Registry for retention by following the procedures described in Chapter 2 and in RA2 of the Reference Residential Appendix. Registration ensures that the project follows the

appropriate verification process, provides tracking, and provides instant access to the most current documentation.

4.8.2 Construction-Phase Documentation

During construction, the general contractor or specialty subcontractors must complete all applicable sections of the certificate of installation (CF2R) for any building design special features specified on the certificate of compliance (CF1R). A list of CF2R sections that apply to the HVAC special feature requirements follows:

1. HVAC Systems
2. Duct Leakage Diagnostics
3. Refrigerant Charge Verification
4. Duct Design Verification for the Location and Area Reduction Compliance Measures. The duct design specifications and layout must be included on the building plans submitted to the enforcement agency, and a copy of the duct design layout must be posted or made available with the building permit(s) issued for the building and must be made available to the enforcement agency, installing contractor, and HERS Rater for use during installation and for all applicable inspections.
5. Fan Efficacy Verification
6. System Airflow Verification.
7. High SEER/EER Verification.
8. Whole-Building Ventilation for Indoor Air Quality (IAQ), Local Ventilation Exhaust, and Other IAQ Measures Given in ASHRAE Standard 62.2

Like the CF1R, registration of the CF2R is required. The licensed contractor responsible for the installation must submit the CF2R information that applies to the installation to a HERS Provider Data registry using procedures described in Chapter 2 and in RA2 of the Reference Residential Appendix.

4.8.3 Field Verification and/or Diagnostic Testing

For buildings for which the certificate of compliance (CF1R) requires HERS field verification for compliance with the Energy Standards, a HERS Rater must visit the site to perform field verification and diagnostic testing to complete the applicable heating and cooling system certificates of field verification and diagnostic testing (CF3R). The following measures require field verification and diagnostic testing if they are used in the proposed design for compliance and are listed on the CF1R as special “Features Requiring HERS Rater Verification.”

1. Verified duct leakage. 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 use controlled motorized dampers, open only when OA ventilation is required to meet ASHRAE Standard 62.2, and closed when OA ventilation is not required may be configured to the closed position during duct leakage testing.
2. Verified duct design – supply duct location, surface area, and R-value (including buried ducts).
3. Low-leakage ducts in conditioned space.
4. Low-leakage air handlers.

5. Refrigerant charge verification
6. Verification of installation of a fault indicator display (FID)
7. Forced air system airflow verification using the installer-provided hole for the placement of a hole for a static pressure probe (HSPP), or a permanently installed static pressure probe (PSPP).
8. Air handler fan watt draw.
9. High-efficiency air conditioner energy efficiency ratio (EER).
10. Evaporatively cooled condensers.
11. Photovoltaic (PV) field verification. To receive PV rebates for photovoltaic installations under the New Solar Home Partnership, the output of the installed system must be measured and shown to comply with the output specified on the rebate application (taking into account variables such as the solar insolation, the time, and the temperature)
12. Central fan-integrated systems for ventilation cooling for air handler fan watt draw.
13. Whole-building ventilation for indoor air quality (IAQ), local ventilation exhaust, and other IAQ measures given in ASHRAE Standard 62.2

Field verification for nonmandatory features is necessary only when performance credit is taken for the measure. For example, maximum cooling capacity need only be HERS-verified if maximum cooling capacity was used to achieve credit in the proposed design. Some field verification is for mandatory measures and will occur in all homes, unless they are exempt from the measure.

Like the CF1R and CF2R, registration of the CF3R is required. The HERS Rater must submit the field verification and diagnostic testing information to the HERS Provider data registry as described in Chapter 2. For additional details describing HERS verification and the registration procedure, refer to RA2 of the Reference Residential Appendix.