LIVERMORE
CALIFORNIA

Residential Duct Testing & Sealing with Furnace and/or Air Conditioner Replacement

2008 California Energy Efficiency Standards

New or Replacement Heating and/or Cooling Systems:

If new or replacement heating and/or cooling systems or ducts are to be installed, they must meet the requirements listed below:

1. Heating equipment must have a minimum 78% AFUE (Exception: Wall & floor furnaces; room heaters).
2. Central air conditioners & heat pumps less than 65,000 Btu/hr must have a minimum 13 SEER.
3. Newly installed or replaced ducts must have a minimum insulation value of R-6. When more than 40 ft of ducting will be installed or replaced, the duct will need to be tested.
4. A setback type thermostat (24 hr clock with four set points) is required for all alterations.
5. New or replacement ducts must meet the mandatory requirements of Section 150(m):
   - All joints and openings in the in the HVAC system must be sealed.
   - Only UL 181, UL 181A, or UL 181B approved tapes or mastic shall be used to seal duct openings.
   - Connections of metal ducts and the inner core of flex ducts shall be mechanically fastened. Flex ducts must be connected using a metal sleeve/coupling.
   - Flex ducts that are suspended must be supported every 4ft. max for horizontal runs with no more than 2" of sag between supports and 6 ft. max for vertical runs.

WHEN IS HERS VERIFICATION REQUIRED AND WHAT FORMS ARE REQUIRED?

HERS verification is required for **all** HVAC alterations in Climate Zone 10-15. A HERS rater is a special inspector for the building department. The building inspector may also request to be on site to witness testing by the contractor and/or HERS rater. The installer picks one of the four options on the CF-1R-ALT-HVAC Form that describe the work being conducted. Each option lists the forms required to be at the job site for final inspection.

- CF-6R Forms shall be completed and submitted by the installing contractor for final inspection.*
- CF-4R Forms shall be completed, registered with an approved HERS Provider (cannot be completed by hand), and submitted by the HERS Rater for final inspection effective January 1, 2010.

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Permit Center

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DESCRIPTION OF HERS TESTS BELOW (Full descriptions found in Residential Appendix RA3 and Residential Manual)

Duct sealing – The installer is to insure leakage of the HVAC system is less than 6% for new air conditioning system (new equipment and all new ducts) or 15%, 60% reduction, seal all accessible leaks, etc. for alterations to existing HVAC systems. When the contractor uses the option to seal all accessible leaks, all easily movable objects must be moved to seal existing ducting. New ducting installed by the contractor is not allowed to have any leaks even if it is no longer accessible. In example 3 of the CF-1R "all new ducts" means that all the ducting was changed. The original boots, plenums, etc. do not need to be changed.

Cooling Coil Airflow (CCA) – There are two different minimum air flow requirements that must be met. These are 300 CFM and 350 CFM. The minimum 300 CFM per ton of cooling is required in order to conduct a refrigerant charge test. For new HVAC systems (new equipment and new ducts) the HVAC system must move a minimum 350 CFM of air for each ton of cooling.

Refrigerant Charge (RC) – The installer is required to verify the charge is correct. If the outside temperature is below 55 degrees then the weigh in method must be used by the installer. When the weigh in method is used the HERS rater must retest when the temperature is 55 and above. A charge indicator display (CID) can be used in place of conducting an RC, manufacturers are currently developing this device.

Temperature Measurement Access Holes (TMAH) – Installer must drill and mark holes to measure temperature split.

Hole for the placement of a Static Pressure Probe (HSPP) or Permanently installed Static Pressure Probe (PSPP) – Either the installer must drill and mark holes to measure static pressure or a permanently installed pressure probe must be installed and marked.

Saturation Temperature Measurement Sensors (STMS) – Permanently installed type K thermocouple are installed on the indoor and outdoor coil so that the HERS rater can verify charge without attaching gauges. Instructions are found in Ch 4 of the Res. Manual.

Fan Watt Draw (FWD) – Installer verifies that the furnace fan watt draw is less than 0.58 Watts/CFM.

NOTE: The CF-6R-MECH-04 is required for all HVAC alterations.

*** For Final inspection ALL compliance forms (CF-1Rs, CF-6Rs, and CF-4Rs) shall be registered with an approved HERS Provider for building permit applications submitted on or after October 1, 2010.**