Residential Furnace and Air Conditioning Requirements
Effective January 1, 2010

Forms:

- A **CF-1R-ALT** Form must be submitted with all applications to demonstrate compliance with the 2008 California Energy Standards.
- A **CF-6R-MECH-04** form must be posted, or made available with the building permit(s) at final inspection, and a signed copy is required to be included with the documentation the installer provides to the building owner.
- Whenever Duct Sealing and Testing, Refrigerant Charge Measurement and/or Airflow/Fan Watt Draw testing is required, a **CF-4R** Form completed by a HERS Rater shall be submitted at or before the Final Inspection.
  Diagnostic testing and verification by a certified HERS Rater is independent of and in addition to the City of Pleasanton inspections. A listing of certified HERS raters maybe found on the HERS provider website at: http://www.energy.ca.gov/HERS/

Minimum Requirements:

- Central furnaces with an output capacity below 225,000 Btu/hr shall have a minimum 78% Annual Fuel Utilization Efficiency (AFUE).
- Single phase air conditioners and heat pumps with an output capacity below 65,000 Btu/hr shall have a minimum 13 Seasonal Energy Efficiency Ratio (SEER).
- Non-ducted, non-central gas fired heating equipment (wall furnace, space heater, etc.) minimum standards are on the next page in Table E-2.

Duct Sealing and Testing:

- Whenever HVAC equipment will be added or replaced (including the air handler, outdoor condensing unit of a split system A/C or heat pump, cooling or heating coil, or the furnace heat exchanger), the ducts are to be sealed and tested by a HERS Rater, per §152(b)1E.
  Exceptions:
  - Duct systems that are documented to have been previously sealed, confirmed through HERS verification in accordance with procedures in Reference Residential Appendix RA3.
  - Duct systems with less than 40 linear feet in unconditioned space.
  - Existing duct systems constructed, insulated or sealed with asbestos.
- Whenever the entire existing duct system is replaced or a new space-conditioning system (HVAC equipment and ducting) will be added, the ducts are to be sealed and tested by a HERS Rater, per §152(b)1D.
- Whenever more than more than 40 linear feet of ducting will be added or replaced in unconditioned space, the ducts are to be sealed and tested by a HERS Rater, per §152(b)1D.
  Exception: Existing duct systems that are extended, which are constructed, insulated or sealed with asbestos.

The applicant shall identify that Duct Sealing and Testing is required under the HERS Verification Summary on Page 5 of the CF-1R-ALT Form. A CF-4R form will be completed and signed by the HERS Rater, and shall be submitted either at or before the Final Inspection.

Refrigerant Charge Measurement:
The following HVAC alterations will require a refrigerant charge measurement:

- Whenever a new split space-conditioning system (HVAC equipment and ducting) will be added, a refrigerant charge measurement shall be verified.
- Whenever HVAC equipment will be added or replaced (including the air handler, outdoor condensing unit of a split system A/C or heat pump, cooling or heating coil, or the furnace heat exchanger), a refrigerant charge measurement shall be verified per §152(b)1F.
  Exception: Heating only systems.

The applicant shall identify that a Refrigerant Charge Measurement is required under the HERS Verification Summary on Page 5 of the CF-1R-ALT Form. A CF-4R form will be completed and signed by the HERS Rater, and shall be submitted either at or before the Final Inspection.

Airflow (Fan Flow) and Fan Watt Draw:
The following HVAC alterations will require airflow and fan watt draw testing:

- Whenever a central space-conditioning system (HVAC equipment and ducting) is added, the airflow and fan watt draw shall be verified per §151(f)7B.
- Whenever the entire existing space-conditioning system (HVAC equipment and ducting) is replaced, the airflow and fan watt draw shall be verified per §152(b)1F.

The applicant shall identify that Airflow and Fan Watt Draw testing is required under the HERS Verification Summary on Page 5 of the CF-1R-ALT Form. A CF-4R form will be completed and signed by the HERS Rater, and shall be submitted either at or before the Final Inspection.

Non-Central Gas Heaters:
Non-ducted, non-central gas fired heating equipment (wall furnace, space heater, etc.) identified on the CF-1R-ALT Form shall meet the minimum efficiency requirements in the 2007 Appliance Efficiency Regulations, as shown in Table E-2.

Table E-2 (2007 Appliance Efficiency Regulations)

Appliance	*Design Type*	*Capacity (Btu per hour)*	*Minimum AFUE (%)*
Wall furnace	Fan	≤ 42,000	73
Wall furnace	Fan	> 42,000	74
Wall furnace	Gravity	≤ 10,000	59
Wall furnace	Gravity	> 10,000 ≤ 12,000	60
Wall furnace	Gravity	> 12,000 ≤ 15,000	61
Wall furnace	Gravity	> 15,000 ≤ 19,000	62
Wall furnace	Gravity	> 19,000 ≤ 27,000	63
Wall furnace	Gravity	> 27,000 ≤ 46,000	64
Wall furnace	Gravity	> 46,000	65
Floor furnace	All	≤ 37,000	56
Floor furnace	All	> 37,000	57
Room heater	All	≤ 18,000	57
Room heater	All	> 18,000 and ≤ 20,000	58
Room heater	All	> 20,000 and ≤ 27,000	63
Room heater	All	> 27,000 and ≤ 46,000	64
Room heater	All	> 46,000	65

HVAC SYSTEMS - HEATING

Heating Equipment Type and Capacity[1,2,3]	Minimum Efficiency (AFUE or HSPF)	Distribution Type and Location[4]	Duct or Piping Insulation R-Value	Thermostat Type	Configuration (Central, Split, Space, Package or Hydronic)

1. Indicate Heating Type (Central Furnace, Wall Furnace, Heat pump, Boiler, Electric Resistance, etc.)

2. Electric resistance heating is allowed only in Component Package C, or except where electric heating is supplemental (i.e., if total capacity ≤ 2 KW or 7,000 Btu/hr electric heating is controlled by a time-limiting device not exceeding 30 minutes). See §151(b)3 exception.

3. Refer to the HERS Verification section on Page 4 of the CF-1R-ALT Form for additional requirements and check applicable boxes.

4. Indicate Type or Location (Ducts, Hydronic in Floor, Radiators, etc.)

HVAC SYSTEMS - COOLING

Cooling Equipment Type and Capacity[1,2]	Minimum Efficiency (SEER/EER or COP)	Distribution Type and Location[3]	Duct or Piping Insulation R-Value	Thermostat Type	Configuration (Central, Split, Space, Package or Hydronic)

1. Indicate Cooling Type (A/C, Heat pump, Evap. Cooling, etc)

2. Refer to the HERS Verification section on Page 4 of the CF-1R-ALT Form for additional requirements and check applicable boxes.

3. Indicate Type or Location (Ducts, Hydronic in Floor, Radiators, etc.)

Project Name:	Climate Zone #	# of Stories

HERS VERIFICATION SUMMARY *The enforcement agency should pay special attention to the HERS Measures specified in this checklist below. A completed and signed CF-4R Form for all the measures specified shall be submitted to the building inspector before final inspection.*

Duct Sealing & Testing *HERS verification is required for this measure.*

☐ **YES** ☐ **NO** YES: In Climate Zones 2 and 9-16, if more than 40 linear feet of new or replacement ducts are installed in unconditioned space, the ducts are to be sealed per §152(b)1Dii and the newly installed ducts are to be insulated per §151(f)10.

- ☐ **EXCEPTION: Existing duct systems that are extended, which are constructed, insulated or sealed with asbestos.**

☐ **YES** ☐ **NO** YES: In Climate Zones 2 and 9-16, if the existing space-conditioning system (HVAC equipment and ducting) is replaced, the ducts are to be sealed per §152(b)1Di.

☐ **YES** ☐ **NO** YES: In Climate Zones 2 and 9-16, if the existing HVAC equipment is replaced (including the replacement of the air handler, outdoor condensing unit of a split system, cooling or heating coil, or the furnace heat exchanger) the ducts are to be sealed per §152(b)1E.

- ☐ **EXCEPTION: Duct systems that are documented to have been previously sealed confirmed through HERS verification in accordance with procedures in the Reference Residential Appendix RA3.**
- ☐ **EXCEPTION: Duct systems with less than 40 linear feet in unconditioned space.**
- ☐ **EXCEPTION: Existing duct systems constructed, insulated or sealed with asbestos.**

Refrigerant Charge - Split System *HERS verification is required for this measure.*

☐ **YES** ☐ **NO** YES: In Climate Zones 2 and 8-15, when the existing HVAC equipment is replaced (including the replacement of the air handler, outdoor condensing unit of a split system A/C or heat pump, cooling or heating coil, or the furnace heat exchanger) a refrigerant charge measurement shall be verified per §152(b)1F.

Central Fan Integrated (CFI) Ventilation System and Fan Watt Draw

The ventilation requirements of §150(o) do not apply to existing residential homes.

Ducted Split Systems - Air Conditioners and Heat Pumps: Airflow *HERS verification is required for this measure.*

☐ **YES** ☐ **NO** YES: In Climate Zones 10 through 15, when the existing space-conditioning system (HVAC equipment and ducting) is replaced, the airflow and fan watt draw shall be verified per §152(b)1Ci to meet the requirements of §151(f)7B.

Documentation Author's Declaration Statement

- **I certify that this Certificate of Compliance documentation is accurate and complete.**

Name:	Signature:
Company:	Date:
Address:	If Applicable ☐ CEA or ☐ CEPE (Certification #):
City/State/Zip:	Phone:

Responsible Building Designer's Declaration Statement

- I am eligible under Division 3 of the California Business and Professions Code to accept responsibility for the building design identified on this Certificate of Compliance.
- I certify that the energy features and performance specifications for the building design identified on this Certificate of Compliance conform to the requirements of Title 24, Parts 1 and 6 of the California Code of Regulations.
- The building design features identified on this Certificate of Compliance are consistent with the information provided to document this building design on the other applicable compliance forms, worksheets, calculations, plans and specifications submitted to the enforcement agency for approval with this building permit application.

Name:	Signature:
Company:	Date:
Address:	License:
City/State/Zip:	Phone:

For assistance or questions regarding the Energy Standards, contact the Energy Hotline at: 1-800-772-3300.

INSTALLATION CERTIFICATE		CF-6R-MECH-04
Space Conditioning Systems, Ducts and Fans		(Page 1 of 2)
Site Address:	Enforcement Agency:	Permit Number:

Space Conditioning Systems

Heating Equipment

Equip Type (package-heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (AFUE, etc.)[1, 3] (≥CF-1R value)[4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Heating Load (Btu/hr)	Heating Capacity (Btu/hr)

Cooling Equipment

Equip Type (package heat pump)	CEC Certified Mfr. Name and Model Number	ARI Reference Number [2]	# of Identical Systems	Efficiency (SEER and EER) [1, 3] (≥CF-1R value) [4]	Duct Location (attic, crawl-space, etc.)	Duct R-value	Cooling Load (Btu/hr)	Cooling Capacity (Btu/hr)

1. If project is new construction, see Footnotes to Standards Table 151-B and Table 151-C for duct ceiling alternative compliance.

2. ARI Reference Number can be found by entering the equipment model number at http://www.aridirectory.org/ari/ac.php#

3. Listed efficiency on this page must be greater than or equal (≥) to the value shown on the CF-1R form.

4. When CF-1R is reference it is also applicable to the CF-1R, CF-1R-AA or CF-1R-ALT

ALL BOXES MUST BE CHECKED TO BE A VALID FORM

☐ §110-§113: HVAC equipment is certified by the California Energy Commission.

☐ §150(h): Heating and/or cooling loads calculated in accordance with ASHRAE, SMACNA, or ACCA.

☐ §150(i): Setback Thermostat on all applicable heating and/or cooling systems meet the requirements of §112(c).

☐ §150(j)2: Pipe insulation for cooling system refrigerant suction, chilled water and brine lines meets minimum requirements of Table 150-B and includes a vapor retardant or is enclosed entirely in conditioned space.

Ducts and Fans

§150(m): Duct and Fans

☐ 1. All air-distribution system ducts and plenums installed, sealed and insulated to meet the requirements of CMC Sections 601, 602, 603, 604, 605 and Standard 6-5; supply-air and return-air ducts and plenums are insulated to a minimum installed level of R-4.2 or enclosed entirely in conditioned space. Openings shall be sealed with mastic, tape or other duct-closure system that meets the applicable requirements of UL 181, UL 181A, or UL 181B or aerosol sealant that meets the requirements of UL 723. If mastic or tape is used to seal openings greater than 1/4 inch, the combination of mastic and either mesh or tape shall be used; and

☐ 1. Building cavities, support platforms for air handlers, and plenums defined or constructed with materials other than sealed sheet metal, duct board or flexible duct shall not be used for conveying conditioned air. Building cavities and support platforms may contain ducts. Ducts installed in cavities and support platforms shall not be compressed to cause reductions in the cross-sectional area of the ducts.

☐ 2D. Joints and seams of duct systems and their components shall not be sealed with cloth back rubber adhesive duct tapes unless such tape is used in combination with mastic and draw bands.

☐ 7. Exhaust fan systems have back draft or automatic dampers.

☐ 8. Gravity ventilating systems serving conditioned space have either automatic or readily accessible, manually operated dampers.

☐ 9. Protection of Insulation. Insulation shall be protected from damage, including that due to sunlight, moisture, equipment maintenance, and wind. Cellular foam insulation shall be protected as above or painted with a coating that is water retardant and provides shielding from solar radiation that can cause degradation of the material.

☐ 10. Flexible ducts cannot have porous inner cores.

DECLARATION STATEMENT

- I certify under penalty of perjury, under the laws of the State of California, the information provided on this form is true and correct.
- I am eligible under Division 3 of the Business and Professions Code to accept responsibility for construction, or an authorized representative of the person responsible for construction (responsible person).
- I certify that the installed features, materials, components, or manufactured devices identified on this certificate (the installation) conforms to all applicable codes and regulations, and the installation is consistent with the plans and specifications approved by the enforcement agency.
- I reviewed a copy of the Certificate of Compliance (CF-1R) form approved by the enforcement agency that identifies the specific requirements for the installation. I certify that the requirements detailed on the CF-1R that apply to the installation have been met.
- **I will ensure that a completed, signed copy of this Installation Certificate 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 signed copy of this Installation Certificate is required to be included with the documentation the builder provides to the building owner at occupancy.**

Company Name: (Installing Subcontractor or General Contractor or Builder/Owner)		
Responsible Person's Name:		Responsible Person's Signature:
CSLB License:	Date Signed:	Position With Company (Title):