	CITY OF HAWAIIAN GARDENS DEPARTMENT OF COMMUNITY DEVELOPMENT BUILDING AND SAFETY DIVISION 21815 Pioneer Boulevard Hawaiian Gardens, Ca 90716 (562) 420 2641	**B-023** EFFECTIVE : 1-05-2015

RESIDENTIAL HVAC REGULATIONS

New, replacement and altered Space-Conditioning Systems require completion and registration of the compliance documents including the CF1R, CF2R and CF3R. These forms shall be made available at time of final inspection.

New, replacement and altered Space-Conditioning Systems shall comply with the minimum efficiency requirements found in the 2013 Building Energy Efficiency Standards and the applicable requirements listed below.

Space-Conditioning Equipment.

1. **Building Cooling and Heating Loads**. Building heating and cooling loads shall be determined using a method based on any one of the following when the duct system is replaced (the duct system is considered new when more than 75% of the duct work is replaced):

    A. The ASHRAE Handbook, Equipment Volume, Applications Volume, and Fundamentals Volume; or
    B. The SMACNA Residential Comfort System Installation Standards Manual; or
    C. The ACCA Manual J.

NOTE: The cooling and heating loads are two of the criteria used to determine equipment sizing and selection (the 2013 Building Energy Efficiency Standards do not require sizing based on heating and cooling loads for residential systems).

Heating systems are required to have a minimum heating capacity adequate to heat the space to a temperature of 68 degrees at a point 3’ above the floor per the CBC.

A. Design conditions. For the purpose of sizing the space-conditioning (HVAC) system, the indoor design temperatures shall be 68°F for heating and 75°F for cooling. Outdoor design conditions shall be selected from Reference Joint Appendix JA2.

B. Outdoor Condensing Units. Installed air conditioner and heat pump outdoor condensing units shall have a clearance of at least five (5) feet (1.5 meters) from the outlet of any dryer vent.

C. Line Set Insulation. Pipe for cooling system lines shall be insulated as specified in TABLE 120.3-A. Insulation located outside of the conditioned space shall be protected by a Class I or Class II vapor retarding facing such as aluminum, sheet metal, painted canvas or plastic cover.

TABLE 120.3-A PIPE INSULATION THICKNESS

FLUID TEMPERATURE RANGE (°F)	CONDUCTIVITY RANGE (in Btu-inch per hour per square foot per °F)	INSULATION MEAN RATING TEMPERATURE (°F)	NOMINAL PIPE DIAMETER (in inches)				
			< 1	1 to <1.5	1.5 to < 4	4 to < 8	8 and larger
			INSULATION THICKNESS REQUIRED (in inches)				
Space cooling systems (chilled water, refrigerant and brine)							
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0
Below 40	0.20-0.26	50	1.0	1.5	1.5	1.5	1.5

2. **Thermostats**. Heating and cooling systems shall be equipped with setback thermostats.
3. **Refrigerant Charge**. Refrigerant charge verification is required in Climate Zones 2 and 8-15.

   EXCEPTION: When the outdoor temperature is less than 55 degrees F and the installer utilizes the weigh-in method. (Must be performed in the presence
   EXCEPTION: Packaged systems for which the manufacturer has verified correct system refrigerant charge prior to shipment from the factory are not required to confirm refrigerant charge through HERS field verification and diagnostic testing.

Air-Distribution and Ventilation System Ducts, Plenums, and Fans.

1. **CMC Compliance.** All air-distribution system ducts and plenums shall be installed, sealed and insulated to meet the requirements of the California Mechanical Code.

   A. Connections of metal ducts and the inner core of flexible ducts shall be mechanically fastened.
   B. 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.
   C. If mastic or tape is used to seal openings greater than 1/4inch, the combination of mastic and either mesh or tape shall be used.
   D. 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 drawbands.

2. **Duct Insulation R-value Ratings**. All ducts shall be insulated to R6 except duct systems in Climate Zones 11, and 14 – 16 shall be insulated to R-8.

3. **Duct System Sealing and Leakage Testing**. When space conditioning systems utilize forced air duct systems, the ducts shall be sealed, and leakage confirmed through HERS field verification and diagnostic testing to conform to the following requirements

   A. **New duct systems**: no more than 6% duct leakage
   B. **Existing duct systems**: no more than 15% duct leakage or no more than 10% leakage to the exterior or seal all exposed leaks using theatrical smoke to verify.
   C. **Extension of an Existing Duct System**. If the new ducts are an extension of an existing duct system, the combined new and existing duct system shall meet the requirements for existing ducts.

4. **Air Filtration.** Mechanical systems that supply air through ductwork exceeding 10 ft. in length shall be provided with air filter devices with having a designated efficiency equal to or greater than MERV 6.

5. **Duct System Sizing and Air Filter Grille Sizing.** Space conditioning systems that utilize forced air ducts to supply cooling to an occupiable space shall comply with the following:

   A. **New Systems**
      i. Airflow greater than or equal to 350 CFM per ton through the return grilles, and a fan efficacy less than or equal to 0.58 W/CFM as confirmed by HERS field verification and diagnostic testing or;
      ii. Comply with prescriptive return duct and grille sizing of Table 150.0-C or 150.0-D as confirmed by HERS field verification and diagnostic testing.

   B. **Altered Systems**
      i. Airflow greater than or equal to 300 CFM per ton through the return grilles confirmed by HERS field verification and diagnostic testing or;
      ii. If unable to comply with the 300 CFM per ton requirement then perform remedial actions listed in RA3.2.2.7.3 and install a thermostat that is capable of receiving and responding to Demand Response Signals confirmed by HERS field verification and diagnostic testing.