



## Building and Safety Division

200 Old Bernal Ave  
Pleasanton, CA 94566-0802  
Office (925) 931-5300 Fax (925) 931-5478

### Residential Water Heaters

#### General Requirements

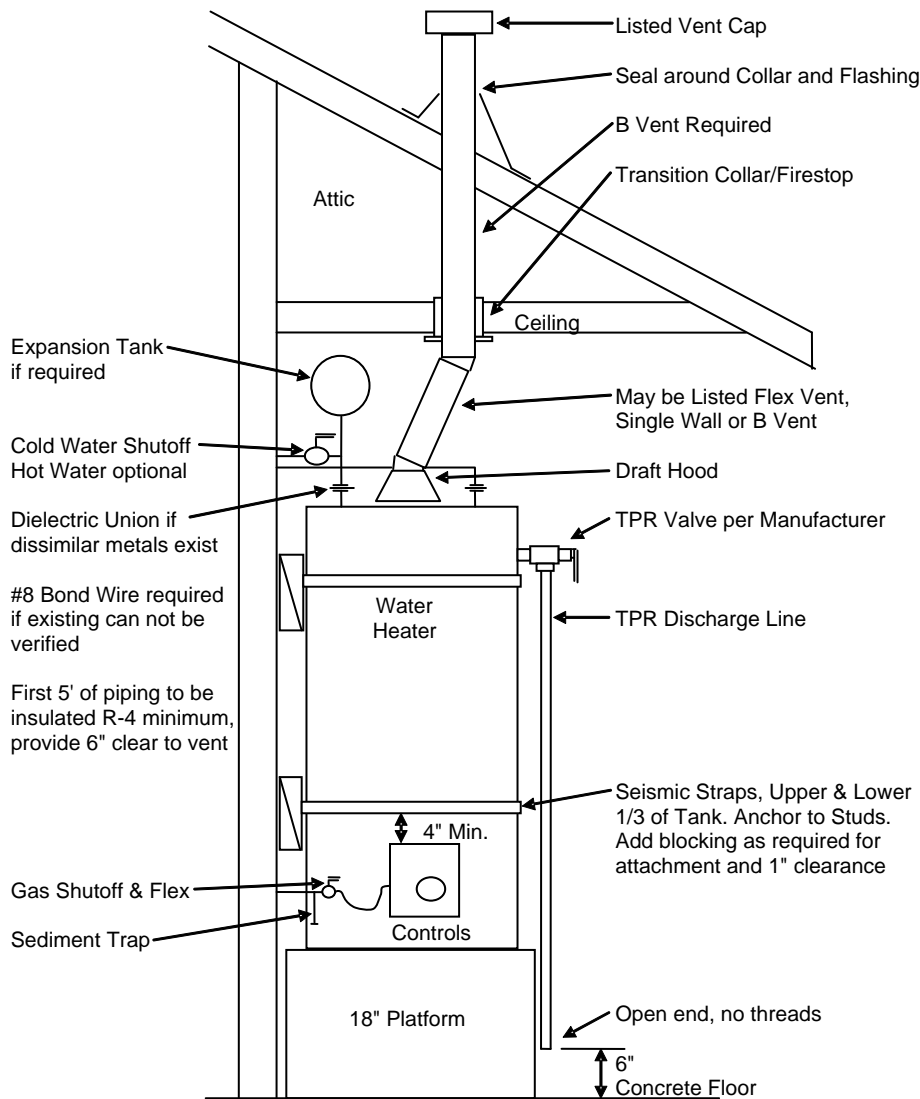
- A plumbing permit is required to install, remove, relocate or replace a water heater. **2007 CPC 503.0.**
- A water heater permit may be issued only to State of California Licensed Contractors, Homeowner or Authorized agent.
- Water heaters require two seismic straps; one located within the top 1/3 of the water heater unit and one at the bottom 1/3. The bottom strap must be located at least 4" above the water heater controls. **CPC 508.2.**
- The first 5' of the hot and cold pipes connected to the water heater shall be insulated with a minimum of R-4 insulation. The insulation shall be installed so that it is at least 6" from single wall vents. **EES 150(j)2.**
- Combustion air is required for safe operation and complete burning of fuels for the appliance. If the water heater is located in a large room or space (e.g. garage) that provides 50 cubic feet per 1,000 Btu for all appliances in the room, the combustion air may come from that area. A water heater located in a closet shall be provided with two vents located within 12" of the floor and 12" of the ceiling. The size of the vents depends on the source of the fresh air. Inside source is 1 in<sup>2</sup> per 1,000 BTU, 100 in<sup>2</sup> minimum. Outside source is 1 in<sup>2</sup> per 4,000 BTU direct or vertical duct and 1 in<sup>2</sup> per 2,000 BTU for horizontal duct. **CPC 507.**
- A pressure/temperature (P/T) relief valve is required on the tank and shall be provided with a drain line extending to the exterior of the building to discharge between 6 and 24 inches above grade. Drain lines shall be copper, galvanized steel or CPVC and shall be installed so all water will drain completely out of the pipe without traps or reverse grades. **CPC 608.5.**
- If the energy factor of the heater is equal to or less than the minimum standards an R-12 external insulation blanket must be installed. **EES 150(j)1.** The minimum standards published in the Appliance Efficiency Regulations, Table F-4, for gas-fired storage water heaters are 0.67- (.0019xV), where V is the tank volume in gallons. This results in the following minimum EF values; 30 gal (0.613), 40 gal (0.594), 50 gal (0.575), etc. If you purchase a water heater that has an EF value greater than the minimum you do not need an external blanket.
- Venting systems for gas-fired water heaters shall satisfy the draft requirements of the water heater in accordance with the manufacturer's instructions. Single wall gas vents require 6" clearance to combustibles and cannot extend into enclosed framing, attics, or roof areas. The transition between single wall vent and double wall Type "B" vent shall be done with an approved transition collar. B vents require 1" clearance to combustibles. **CPC 510.**
- Gas vents shall terminate in a listed vent cap a minimum of 1 foot above the roof surface and 8 feet away from a vertical wall. **CPC 510.6.2(1).**
- Equipment must be installed in accordance with its listing and manufacturer's instructions.
- Any water system provided with a check-valve, back-flow preventer or any other normally closed device that prevents dissipation of building pressure back into the water main shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. **CPC 608.3**

## Water Heaters in Garages

- The Temperature and pressure (P/T) valve may discharge onto the garage floor provided the end of the discharge pipe is within 6" of the floor and the surface of the concrete slopes to provide drainage away from the house.
- Water heaters located in garages shall be elevated 18" above the garage floor on a platform unless they are specifically listed as flammable vapor ignition resistant (sealed or closed combustion chamber). Barriers shall be installed if the water heater is subject to damage from a vehicle. **CPC 508.14.**

## Water heaters in Attics or on Wood Framing

- Water heaters located in attics or on wood flooring or ceilings where damage may occur from a leak, a watertight pan of corrosion resistant materials shall be installed beneath the water heater with a minimum  $\frac{3}{4}$ " drain to an approved location. **CPC 508.4**
- Discharge from a relief valve into a water heater pan shall be prohibited. **CPC 508.5.**



**Typical Gas Water Heater Installation**