



CITY OF REDDING  
Building Division  
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## WATER HEATER REPLACEMENT

ALL WORK SHALL BE IN COMPLIANCE WITH THE CURRENT CALIFORNIA BUILDING CODES CBC, CRC, CEC, CMC, AND CPC (TITLE 24)

Permits are required prior to installation or replacement of water heater systems. This brochure is intended to provide general information. Contact the Building Division for any questions or additional information.

### Installation Standards - see attached drawing

1. **Permits** are required for new and replacement water heaters. (502.0 CPC)
2. **Inspection** is required after the water heater is installed to verify compliance within the minimum safety requirements of the code regarding: locations of water heater, combustion air, venting and vent cap, seismic protection/strapping, access and working space around water heater and other appliances, clearances to combustibles, gas piping supply with sediment trap and connections, temperature and pressure relief valve and discharge piping to outside, water and gas hand shut off valves, water piping and connections, metallic piping continuously bonded, to meet required Energy compliance and, if required by location, 18" elevation, vehicle damage protection and drain pan with drain. (503.0 CPC)
3. **Prohibited Locations:** Do not install water heaters which depend on the combustion of fuel in rooms used for sleeping purposes, bathroom, closet or other confined space opening into a bedroom, bathroom, or under a stairway landing. (504.1 CPC)
4. **Seismic Bracing System** shall be installed to provide protection from displacement due to earthquake motion. Water heater shall be anchored/secured with a code-approved restraint system consisting of strapping the upper and lower 1/3 of the water heater, minimum 4" above gas control valve and 4" below side T & P outlet. (507.2 CPC and 17958.5 Health and Safety Code)
5. **Temperature and Pressure Relief Valve and Discharge Line:** Water heaters shall be installed with a T & P relief valve that is ran in rigid metal piping from the T & P valve to the outside of the building, with slope, and the end of the pipe not more than 2' nor less than 6" above the ground or flood level of the area receiving the discharge and pointing downward. The discharge line shall not be trapped or have a valve installed, and the terminating end shall not be threaded. The discharge line of a water heater located in a garage may terminate in the garage. (608.5 CPC)
6. **Combustion Air Vents** are required when the water heater is located in a closet or small room. Combustion air must be provided by two or more vents. Vents must be located within 12" of the top and bottom of the enclosure. Vents must draw air from the outside or from a vented attic or vented crawl space. Water heaters located in a garage or other large space may draw combustion air from that space. (506.0 CPC)

7. **Venting System** shall be constructed, sized appropriately and installed to code and per manufacturer's installation instructions. (509.6.3.1 CPC)
8. **Venting Clearance:** A gravity type venting system must terminate at least 5 feet above the draft hood. Single wall metal vent piping shall be installed in a manner to provide 6" clearance from combustible materials and shall be secured together with Tek screws or rivets. Single wall vent piping shall not be installed in a confined space, and only installed below fire stop flashing. Type B Double wall vent piping shall be installed in a manner to provide 1" clearance from combustible materials and shall not be secured together with Tek screws or rivets. (509.6.2 CPC)
9. **Vent Pipe Termination** shall not terminate less than 12" above roof, additional height required if roof pitch is greater than 6:12 slope, nor shall a vent terminate less than 8 feet from any second story exterior wall. Vent termination in all other cases not to terminate any less than 2 feet above any structure within 10 feet. Other venting rules may apply. (509.6 & Table 509.6.2 CPC)
10. **Gas Appliance Connectors:** Gas connectors must comply with CPC Section 1211.0. Listed flexible connectors in compliance with CSA Z21.24, Standard for Connectors for Gas Appliances may be used if installed in accordance with their listing. Connectors must be located completely in the same room as the appliance. (1211.0 CPC)
11. **Sediment Trap** shall be installed to gas supply at water heater control valve with a T fitting and a minimum 3" nipple in length with cap for sediment trap. (1211.8 CPC)
12. **Metallic Piping to be Bonded** continuously with a #8 copper bonding wire and bonding clamps to cold, hot, and gas lines to tie systems together at water heater. (250.104(B) CEC)
13. **Water Piping Insulation** shall be installed 5' on the cold and 5' on the hot water supplies at water heater when possible, and to maintain 6" clearance from the flue. NOTE: if water heater has a re-circulating pump system, the entire length of circulating piping loop will need to be insulated (Energy Efficiency Standards).
14. **State Energy Regulations** requires the following: If the water heater has an EF of less than 0.58 an R-12 water heater blanket is required (internal insulation cannot be used to satisfy this mandatory requirement.) For water heaters with 0.58 EF or higher, no blanket is required. The blanket should be securely attached around the water heater. The top of the water heater should not be insulated and a cut out in the blanket should be provided for combustible air intake and controls. (Energy Efficiency Standards)
15. **Installation Instructions** for water heater to be on site and readily available for reference. (507.24 CPC)
16. **Working Platform:** A level working surface not less than 30" x 30" shall be provided for service (508.4.4 CPC)
17. **Thermal-Expansion Tank System** shall be required to protect water heater and water piping systems from excess pressure due to thermal-expansion (608.3 CPC & 1006.0 CMC) if a pressure regulator or other back-check valve is installed.
18. **Water Heater Stand** or built in platform is required when water heater is installed in a garage to elevate water heater a minimum 18" above the garage floor. (507.13 CPC)
19. **Vehicle Protection** must be provided where subject to vehicle damage, by means of a barrier post or framed wall at least 4' high. (507.13.1 CPC)

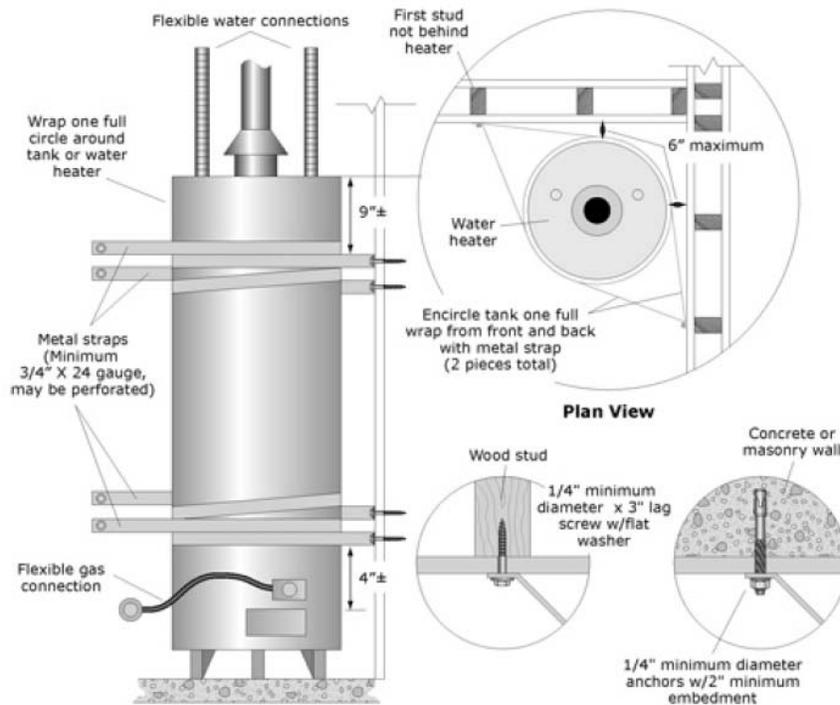
20. **Drain Pan** shall be required when a water heater and/or tank is installed in a location where it could cause damage; in case of failure/leak to floor, sub-floor, drywall, or platform. Drain pan shall be installed with a minimum 3/4" drain outlet and discharge that drain to the exterior of the building or approved location. (507.4 CPC)

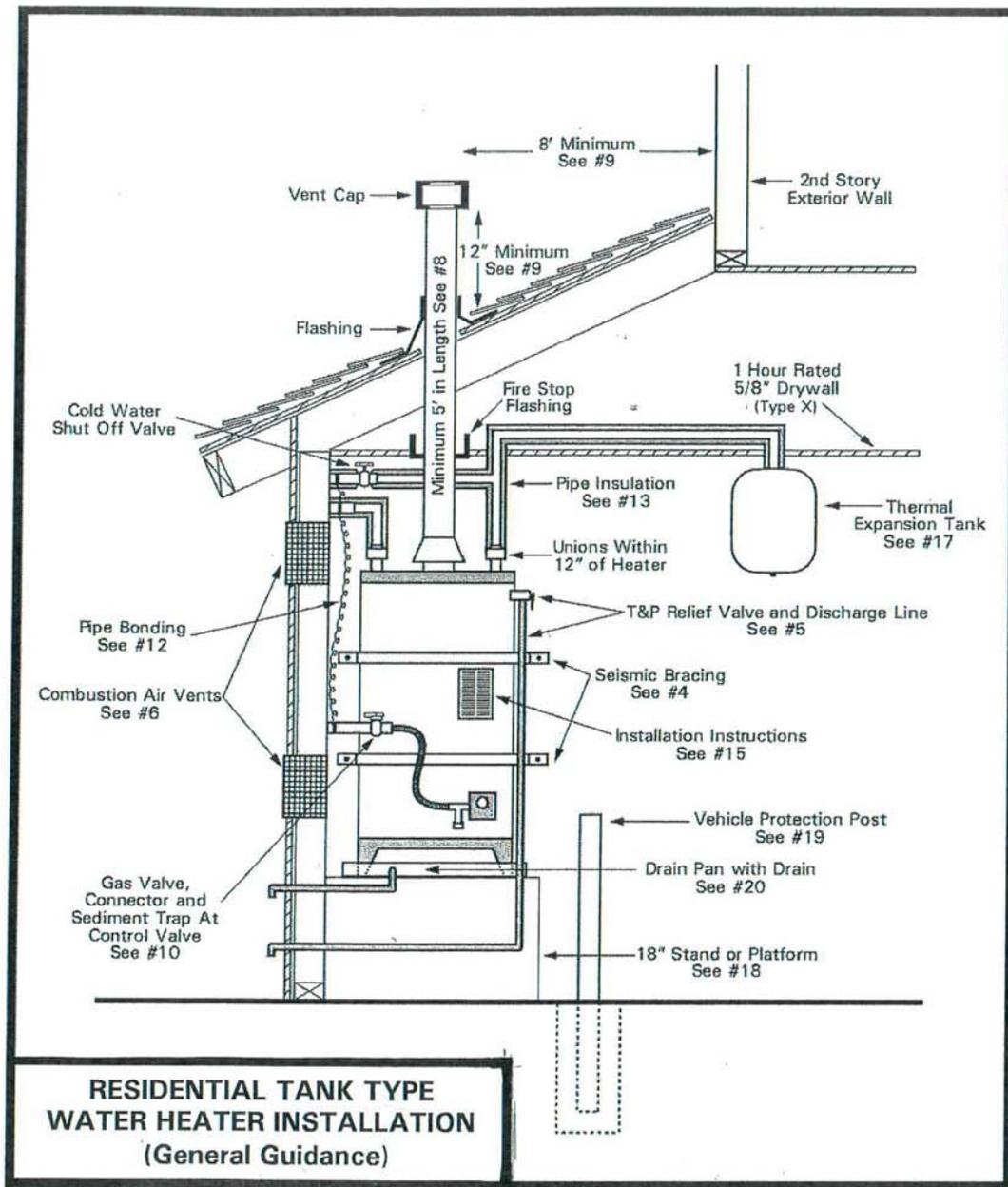
NOTE: Discharge from T & P relief valve cannot terminate into water heater drain pan. (507.5 CPC)

21. **The minimum capacity for water heaters** shall be in accordance with the first hour rating (this can be found on the "Energy Guide" label on the heater) as follows: (CPC 501.0)

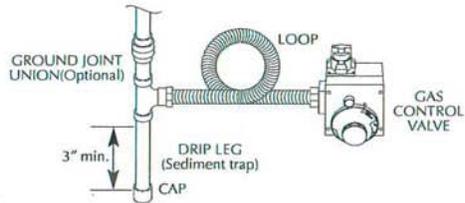
Number of Bathrooms	1 to 1.5		2 to 2.5			3 to 3.5	
Number of Bedrooms	1	2-3	2	3-4	5	3	4-6
First Hour Rating, Gallons	42	54	54	67	80	67	80

### Example to strap water heater





**GAS PIPING WITH FLEXIBLE CONNECTOR**



**GAS PIPING WITH ALL BLACK IRON PIPE TO GAS CONTROL**

