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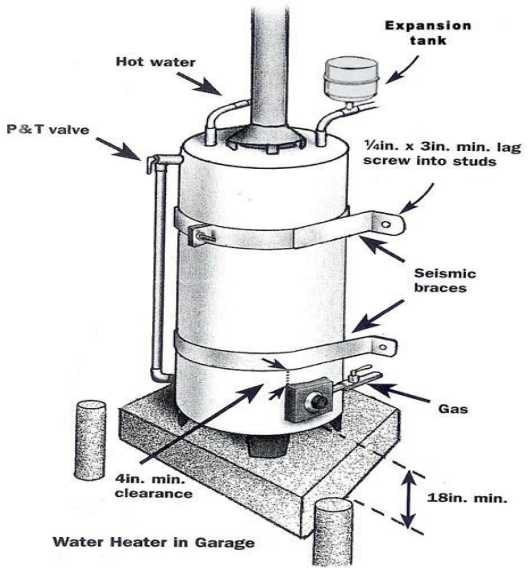
Gas Fired Residential Water Heaters



This handout summaries some of the information contained in the California Plumbing Code and is not all inclusive. For “like-for-like replacements”, it is assumed that a fuel gas system already exists and that adequate venting systems are in place. New installations and relocations are required to meet the requirements of new construction. If conditions are encountered that are not covered in this handout, please consult the appropriate code book(s). They are available for review in many libraries and at the City of Roseville Building Division Permit Center.

All design, construction, and workmanship shall conform to accepted engineering practices, manufacturer’s installation instructions and applicable standards of the California Building Standards Codes. California Residential Code, California Mechanical Code, California Green Building Standards Code, California Electric Code, and California Energy Code requirements are not reflected in this handout.

Permits (CPC Section 503.0)
All water heater installations and replacements require a permit and final inspection.

Seismic Bracing (CPC Section 507.2)
Water heaters require a minimum of two seismic straps to resist horizontal displacement due to earthquake motion; one located within the top 1/3 of the water heater unit and one at the bottom 1/3 of its vertical dimensions. The bottom strap must be located at least 4" above the water heater controls.

Garages (CPC Section 507.13)
Water heaters located in a garage and in adjacent spaces that open to the garage and are not part of the living space of a dwelling unit shall be installed so that all heating elements, switches, burners, and burner-ignition sources (such as pilot lights), elevated a minimum of 18” above the floor. If the water heater is located in an area subject to damage, adequate barriers, or bollards, must be installed.

Bedrooms and Bathrooms (CPC Section 504)
Water heater installations in bedrooms and bathrooms shall comply with one of the following:

1. Fuel-burning water heaters hall be permitted to be installed in a [dedicated] closet located in a bedroom or bathroom provided the closet is equipped with a listed, gasketed door assembly and a self-closing device. The door assembly shall be installed with a threshold and door bottom seal. All combustion air shall be obtained from the outside and the closet shall be for the exclusive use of the water heater.
2. The water heater shall be of the direct vent type.

Drainage Pan (CMC Section 305.5 and CPC 507.5)
When a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, floor-subfloor assembly, or where damage may result from a leaking water heater, a watertight pan of corrosion resistant materials shall be installed beneath the water heater in accordance with all of the following:

1. The drainage pan shall be provided with not less than $^{3}/_{4}$ of an inch (20 mm) diameter drain to an approved location. The terminating end of the drainpipe shall be readily visible.
2. The drainage pan shall be not less than $1^{1}/_{2}$ inches (38 mm) in depth.
3. Where a drainage pan pipe is installed, the material of the piping shall be rated for the temperature rating of the water heater and shall be approved for use with the liquid being discharged.
4. Discharge from a relief valve into a drainage pan shall be prohibited.

Temperature, Pressure, and Vacuum Relief Devices (CPC Section 504.6)
The installation of temperature, pressure, and vacuum relief devices or combinations thereof, and automatic gas shutoff devices shall be installed in accordance with their listings and the manufacturer's instructions. A shutoff valve shall not be placed between the relief valve and the water heater or on discharge pipes between such valves and the atmosphere. The hourly British thermal units (Btu) (kW•h) discharge capacity or the rated steam relief capacity of the device shall be not less than the input rating of the water heater. Discharge piping shall be installed in accordance with CPC Section 608.5.

Installation in Attics and Under-Floor Spaces (CPC Sections 508.4 through 508.4.4)
Water heater installation shall be accessible for inspection, repair, or replacement.

- An attic or under-floor space in which a water heater is installed shall be accessible through an opening and passageway larger than the largest component of the water heater and not less than 22" by 30''.
- The passageway shall be unobstructed and have solid flooring not less than 24" wide from the entrance opening to the water heater.
- Where the height of the passageway is less than 6 feet, the distance from the passageway access to the appliance shall not exceed 20 feet measured along the centerline of the passageway. Where the height of the passageway is 6 feet or more, the distance from the passageway access to the appliance shall not exceed 50 feet measured along the centerline of the passageway.
- A level working platform not less than 30 inches by 30 inches (762 mm by 762 mm) shall be provided in front of the service side of the appliance.
- A permanent 120 V receptacle outlet and a luminaire shall be installed near the appliance. The switch controlling the luminaire shall be located at the entrance to the passageway.

Venting (CPC Section 509)
Venting systems shall be designed and constructed to develop a positive flow adequate to convey all products of combustion (such as flue and vent gasses) to the outside atmosphere. Every factory-built chimney and type B gas vent shall be installed in accordance with the manufacturer's instructions, the terms of its listing and to the applicable requirements of the code.

Combustion Air (CPC Section 506)
Fuel burning water heaters shall be assured a sufficient supply of air for proper fuel combustion and ventilation per the California Plumbing Code. In buildings of unusually tight construction combustion air shall be obtained from outside. In buildings of ordinary tightness insofar as infiltration is concerned, all or portion of the combustion air for fuel burning water heaters may be obtained from infiltration if the enclosure volume equals at least fifty (50) cubic feet per 1000 Btu/h input of all gas burning appliances within.

Pressure/Temperature Valve (CPC Sections 608.3 and 608.5)
All water heaters shall be provided with an approved, listed, adequately sized combination pressure and temperature relief valve installed in an approved location per the manufacturer's instructions. The valve shall be drained to the exterior and terminate toward the ground maintaining between 6" and 24" of clearance from the ground pointing downward. The diameter of the valve opening (generally 3/4") must be maintained to the termination of the drain. When approved by the Chief Building Official, such drain may terminate at other locations (i.e. laundry tub, floor sink, or floor drain). No part of such drain shall be trapped and the terminal end of the drain shall not be threaded.

Expansion Tank (CPC Section 608.3)
An approved, listed expansion tank or other device designed for intermittent operation for thermal expansion control by keeping the system pressure below the relief setting of the P & T valve shall be installed.