



**WATER HEATER INSTALLATION AND REPLACEMENT
COMMUNITY DEVELOPMENT DEPARTMENT BUILDING
DIVISION**

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PURPOSE

The purpose of this guideline is to clarify the minimum 2022 California Plumbing Code requirements when replacing a water heater. A plumbing permit is required for all water heater installations / replacements. The required inspections to ensure these minimums are met are Water Heater and Final Building Inspection. [CPC 502 & 503]

LOCATION

- Water heater installations in bedrooms and bathrooms shall comply with one of the following: [CPC 504.1]
 1. Water heater shall be of the direct vent type. [NFPA 54:10.27.1(2)]
 2. Fuel-burning water heaters shall be permitted to be installed in a closet located in the bedroom or bathroom provided the closet is equipped with a listed, gasketed door assembly and a listed self-closing device. The self-closing door assembly shall meet the requirements of Section 504.1.1. The door assembly shall be installed with a threshold and bottom door seal and shall meet the requirements of Section 504.1.2. Combustion air for such installations shall be obtained from the outdoors in accordance with Section 506.4. The closet shall be for the exclusive use of the water heater.
- Appliances in residential garages 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 burners and burner-ignition devices are located not less than 18 inches (457 mm) above the floor unless listed as flammable vapor ignition resistant. [CPC 507.13] Appliances installed in garages, warehouses, or other areas subject to mechanical damage shall be guarded against such damage by being installed behind protective barriers or by being elevated or located out of the normal path of vehicles. [CPC 507.13.1]
- An attic or under-floor space in which an appliance is installed shall be accessible through an opening and passageway, not less than as large as the largest component of the appliance, and not less than 22 inches by 30 inches. [CPC 508.4] 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. The passageway shall be unobstructed and shall have solid flooring not less than 24 inches wide, a level working platform not less than 30 inches by 30 inches shall be provided in front of the service side of the appliance along with a receptacle and permanent lighting. Where a water heater is located in an attic, in or on an attic ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a watertight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than 3/4 of an inch diameter drain to an approved location. Such pan shall be not less than 11/2 inches in depth [CPC 508.4.1, 508.4.2, 508.1.3, 508.3.3, 507.5]

SEISMIC BRACING

Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one third ($\frac{1}{3}$) and lower one-third ($\frac{1}{3}$) of its vertical dimensions. At the lower point, a *minimum* distance of *four* (4) inches shall be maintained *above* the controls with the strapping. Should an alternate means of seismic strapping be needed, please refer to the Seismic Safety Commissions [Guidelines for Earthquake Bracing of Residential Water Heaters](#) and obtain approval from the Authority Having Jurisdiction. [507.2]

EXPANSION TANK

Expansion tank is required when the water system is "closed loop". A water system provided with a check valve, backflow preventer, or other normally closed device that prevents dissipation of building pressure back into the water main, independent of the type of water heater used, shall be provided with an approved, listed, and adequately sized expansion tank or other approved device having a similar function to control thermal expansion. Pre-pressurized water expansion tanks shall comply with IAPMO Z1088. Such expansion tank or other approved device shall be installed on the building side of the check valve, backflow preventer, or other device and shall be sized and installed in accordance with the manufacturer's installation instructions. [CPC 608.3]

PRESSURE/TEMPERATURE VALVE

The discharge piping serving a temperature relief valve, pressure relief valve, or combination of both shall have no valves, obstructions, or means of isolation and be provided with the following: [CPC 608.5]

1. Not less than the size of the valve outlet and shall discharge full size to the flood level of the area receiving the discharge and pointing down.
2. Materials shall be rated at not less than the operating temperature of the system and approved for such use or shall comply with ASME A112.4.1.
3. Discharge pipe shall discharge independently by gravity through an air gap into the drainage system or outside of the building with the end of the pipe not exceeding 2 feet (610 mm) and not less than 6 inches (152 mm) above the ground and pointing downwards.
4. Discharge in such a manner that does not cause personal injury or structural damage.
5. No part of such discharge pipe shall be trapped or subject to freezing.
6. The terminal end of the pipe shall not be threaded.
7. Discharge from a relief valve into a water heater pan shall be prohibited.
8. The discharge termination point shall be readily observable.

VENTING

Gas vents shall be installed in accordance with the manufacturer's installation instructions. Screws, rivets, and other fasteners shall not penetrate the inner wall of double-wall gas vents, except at the transition from the appliance draft hood outlet, flue collar, or single-wall metal connector to a double-wall vent. A Type B or a Type L gas vent shall terminate at least 5 feet (1524 mm) in vertical height above the highest connected appliance draft hood or flue collar, Decorative shrouds shall not be installed at the termination of gas vents except where such shrouds are listed for use, shall extend through the roof flashing, roof jack, or roof thimble and terminate with a listed cap or listed roof assembly, shall terminate at least 3 feet (914 mm) above a forced air inlet

located within 10 feet. [CPC 509.6, 509.6.1]

COMBUSTION AIR MUST BE MAINTAINED

Air for combustion, ventilation, and dilution of flue gases for appliances installed in buildings shall be obtained. [CPC 506]

INSULATION

Domestic hot water piping shall be insulated. Hot water pipe insulation shall have a minimum wall thickness of not less than the diameter of the pipe for a pipe up to 2 inches in diameter. Insulation wall thickness shall be not less than 2 inches for a pipe of 2 inches or more in diameter. [CPC 609.12.1, 609.12.2]

SEDIMENT TRAP

Where a sediment trap is not incorporated as a part of the appliance, a sediment trap shall be installed downstream of the appliance shutoff valve as close to the inlet of the appliance as practical at the time of appliance installation. The sediment trap shall be either a tee fitting with a capped nipple in the bottom outlet. [CPC 1212.9]

BONDING

Each aboveground portion of a gas piping system, other than CSST, that is likely to become energized shall be electrically continuous and bonded to an effective ground-fault current path. The bonding jumper shall connect to a metallic pipe, pipe fitting, or CSST fitting shall not be smaller than 6 AWG copper wire or equivalent. Gas piping shall not be used as a grounding conductor or electrode. [CPC1211.1, 1211.2.1, 1211.2.2, 1211.4]

