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Building and Safety
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Residential Water Heater Installation Requirements

All water heater installations and replacements require a permit and final inspection per the California Plumbing Code.

INTRODUCTION:

This information is intended to provide general guidance on the installation of tank type gas water heaters in single family residences. Instantaneous fired (tank-less) waters have other requirements and are not covered in this handout. This handout summarizes information contained in the 2013 California Residential Code, 2013 California Plumbing Code, 2013 California Mechanical Code and the 2013 California Energy Efficiency Standards and is not meant to replace them. For like for like replacements, it assumes 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, please consult the appropriate plumbing code books.

GENERAL REQUIREMENTS:

Water heaters must be seismic strapped. Provide two 1-1/2" X 18 ga. Straps. Locate the top strap – 1/3 of the way down and the bottom strap in the lower 1/3 of the water heater. Provide a minimum of 4 inches of clearance from the temperature control valve. Use 3/8" dia. Lag bolts to connect the straps to the framing members. Do not use molly bolts or lag shields into the drywall only.

Provide a temperature and pressure relief valve as required by the manufacturer and hard pipe plumb to the outside and directed to the ground and terminated a minimum of 6" to a maximum of 24" above grade. When replacing an existing water heater, the T & P may be re-installed to drain to the garage floor provided the new installation is in the existing location. Relief valve may not discharge into a secondary drain pan.

A water heater, when located inside or above habitable space, where damage may occur if a leak developed, is required to have a secondary pan with a 3/4" minimum drain line run to the outside.

A 120V electrical receptacle, located within 3 feet of the water heater and accessible to the water heater with no obstructions is required.

The water heater shall have a category III or IV vent, or a type B vent with straight pipe (no bends or offsets) between the outside termination and the space where the water heater is located.

Insulate the first 5 feet of hot and cold water pipes from the water heater or storage tank.

Water heaters located in garages must be protected from mechanical damage. This means placing them out of the path of vehicular traffic or providing a protective post or partition.

For water heaters over 50 gallons, consult the 2013 Title 24 for additional insulation requirements.

VENTING:

A single wall vent connector must be fastened with three sheet metal screws, rivets or other approved fasteners at each joint. Do not use cloth tape.

Single wall vent connectors must start and end in the same space as the water heater.

Double wall vent requires 1" clearance to combustibles. Single wall vent requires 6" clearance to combustibles.

No portion of the connector may penetrate or be concealed within the construction of the building.

Vent connectors must be the same size as the draft hood outlet on the appliance. They must slope up from the draft hood to the vent at least 1/4" per foot.

The total horizontal length of the vent system must not exceed 75% of the vertical height of the vent.

A gravity type venting system must terminate at least 5 feet above the draft hood.

A roof top gas vent, less than 12 inches in size, shall have a termination located not less than 8 feet away from a vertical wall and shall extend a minimum of 2 feet above the highest point where it passes through the roof.

In sizing multiple venting situations the largest vent size plus 50% must be used.

Natural draft (Gravity) vents and mechanical draft systems operating under positive pressure shall not be interconnected.

CLEARANCES

Clearances for most water heaters are found on the appliance label.

Please note the front clearance is usually greater than the side and rear.

Access and working space must be provided.

Shutoff valves must be located in a readily accessible location. (From the access and working space provided)

When the water heater is located within a compartment or attic space, the opening must be at least 24" wide and large enough to remove the water heater.

Water heaters installed in a garage must be elevated so that burners and burner ignition devices are located not less than 18" above the floor unless it is *listed* as Flammable Vapor Ignition Resistant (sealed combustion chamber)

Note that electric water heaters with a switch and/or heating element located less than 18" above the base must also be elevated.

Water heaters installed within an approved compartment having access only from outside the garage shall be permitted to be installed at floor level provided the required combustion air is taken from and discharged to the exterior.

PENETRATIONS

Pipes, both water and gas, must be sealed with an approved material when penetrating a rated wall or ceiling assembly.

Single wall vent connectors shall not penetrate an interior wall, ceiling or other assembly.

Single wall vent connectors shall not originate in an attic or concealed space and shall not pass through an attic concealed space or floor.

B type vents shall use an approved thimble (bucket) when penetrating a rated assembly

FUEL GAS

A listed flexible supply with a maximum length of 3 feet is required. Do not re-use an old flexible supply line.

The gas shutoff valve must be located in a readily accessible location.

Fuel gas piping must be sized for the demand upon it. If a water heater is replaced with a larger one, then the pipe sizing should be reviewed.

COMBUSTION AIR

Fuel burning water heaters must be provided with a sufficient supply of air to assure proper combustion of fuel. In tightly constructed buildings with vapor barriers and weather stripping, the combustion air must be ducted in from the outside or from attic spaces that freely communicate with the outside via permanent screened openings. Combustion air openings must be placed so that one half of the required supply enters the water heater enclosure within 12" of the ceiling and one half enters within 12" of the floor. Openings must be a minimum of three inches in least dimension. A typical 50 gallon water heater will require two – 6" round ducts (25 sq. in. each) Consult the plumbing code for further information on combustion air sizing. Combustion air ducts located in the attic space shall not be screened.

PROHIBITED LOCATIONS

Water heaters that are located in a bedroom or bathroom are required to be in accordance with one of the following:

1. Be installed in a dedicated closet with a listed, gasketed door assembly and a self-closing device, the door assembly 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.

Vent clearances

