CITY OF DANA POINT

COMMUNITY DEVELOPMENT
BUILDING AND SAFETY
33282 Golden Lantern, Suite 209
Dana Point, CA 92629
949 248-3594

www.danapoint.org

B025 - WATER HEATER

2019 CALIFORNIA CODES
CODE CYCLE

01/02/2020
EFFECTIVE DATE

RESIDENTIAL TANK TYPE WATER HEATERS

INTRODUCTION

This information is intended to provide general guidance on the installation of tank type gas water heaters in single family residences. For instantaneous fired (tank-less) water heaters, see the tank-less water heater handout.

This handout summarizes information contained in the 2019 California Residential Code, 2019 California Plumbing Code (CPC), 2019 California Mechanical Code (CMC) and the 2019 California Energy Code 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. They are available for review in many libraries and the Building Division Customer Service Counter.

All water heater installations and replacements require a permit and final inspection per CPC section 503.0.

GENERAL REQUIREMENTS

- 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.
- 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. See drawing on page 4. 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 (CPC 504.6).
- 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 ¾” 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.
- A condensate drain, run to an approved receptor location, that is no more than 2” higher than the base of the water heater, allowing natural drainage without pump assistance is required.

INSULATION

The following pipe insulations are required measures of the 2019 California Energy Code:

- The first 5 feet of hot and cold water pipes from the water heater or storage tank.
- All hot water pipes ¾" or larger requires full and continuous pipe insulation (CEC Section 150.0(j)2Aii).
- All piping associated with a hot water re-circulation system regardless of the diameter.
- Piping from the water heating source to a storage tank and/or between tanks.
- Piping buried below grade.
- All hot water piping between the heat sources to the kitchen fixtures.

FUEL GAS

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 shall be reviewed (see the fuel gas pipe sizing handout available at the Building Counter). A sediment trap installed after the valve and before the 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 prior to the sediment trap.

A new or relocated water heater installation is required to have the gas supply line sized with a capacity of to supply at least 200,000 Btu/Hr. to the water heater.

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 (CPC 504.1).
2. The water heater shall be of the direct vent type.

Water heaters installed in attic spaces or floor ceiling/floor subfloor assemblies where damage may result from a leaking heater, a watertight pan of corrosion resistant materials shall be installed beneath the water heater with a minimum ¾" dia. drain to an approved location (CPC 507.5).

COMBUSTION AIR

Fuel burning water heaters must be provided with a sufficient supply of air to assure proper combustion of fuel (CPC 506.0). 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 openings 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.

VENTING

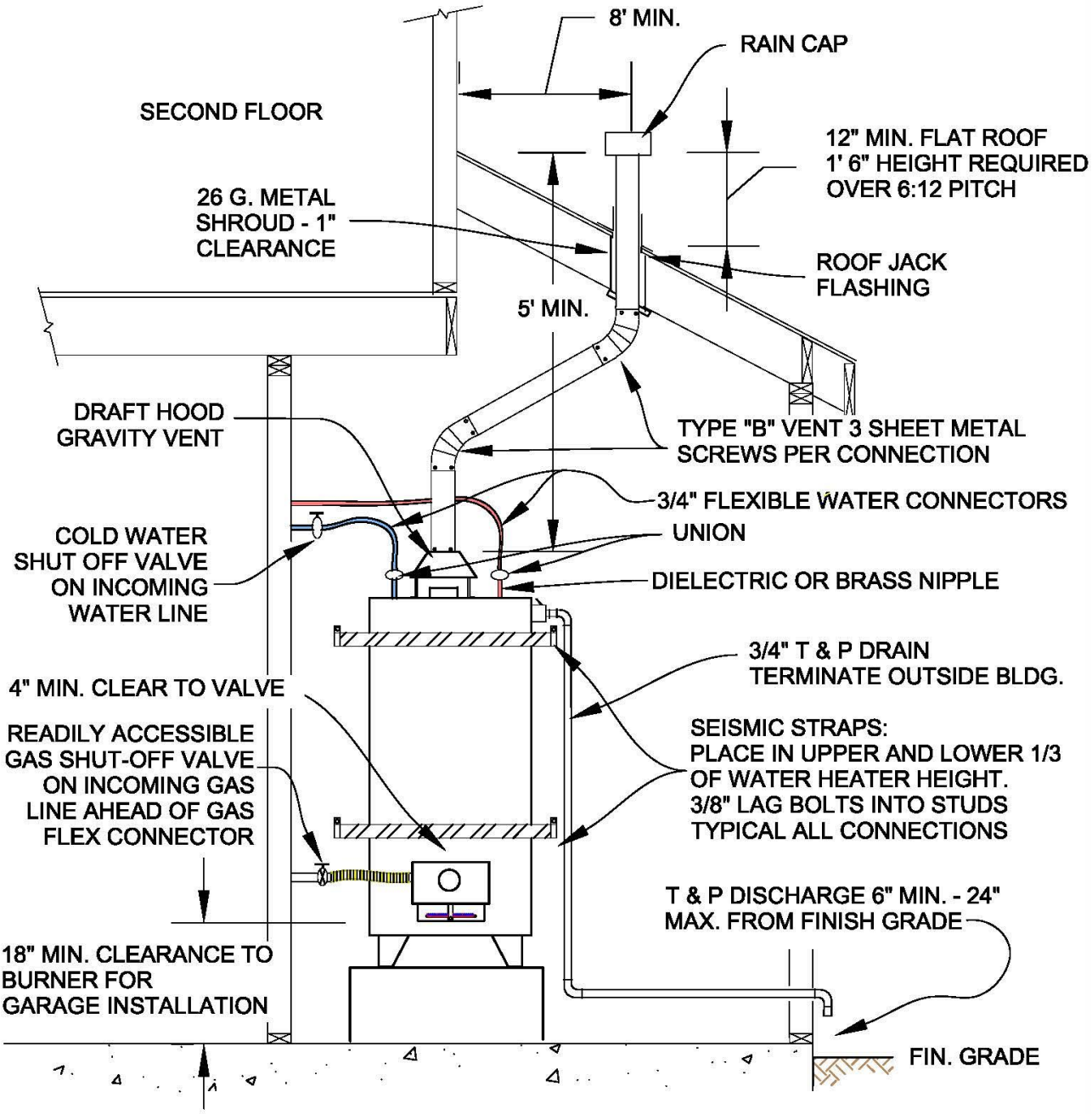
- A single wall vent connector must be fastened with three sheet metal screws, rivets or other approved fasteners at each joint. Do not use cloth tape.
- Single wall vent connectors must start and end in the same space as the water heater.
- No portion of the connector may penetrate or be concealed within 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 ¼" per foot.
- The total horizontal length of the vent system including vent and vent connectors 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 (CPC 509.3.3.3).

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) (CPC 507.13). 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.



TYPICAL WATER HEATER INSTALLATION