CITY OF REDLANDS
DEVELOPMENT SERVICES
DEPARTMENT BUILDING AND
SAFETY DIVISION
35 CAJON AVE SU1TE 15A
REDLANDS, CA LIFORNIA 92373

GAS WATER HEATERS

INTRODUCTION

This information is intended to provide general guidance on the installation of gas water heaters in single family residences. It summarizes information contained in the 2016 California Residential Code, 2016 California Plumbing Code (CPC), and the 2016 California Energy Code (CEES) and is not meant to replace them. It assumes that a fuel gas system already exists and that adequate venting systems are in place. 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 & Safety Division. All water heater installations and replacements require a building permit and final inspection.

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 3. 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. (2016 CPC 507.2)
  - o You may use a different approved method for seismic strapping as well.
- 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. (2016 CPC 608.5)
- The first 5 feet of both the hot and cold supply pipes must be insulated per the 2016 California Energy Code section 150.0(j)2
- Unfired hot water tanks, such as storage tanks and backup storage tanks for solar water-heating systems, shall be externally wrapped with insulation having an installed thermal resistance of R-12 or greater or have internal insulation of at least R-16 and a label on the exterior of the tank showing the insulation R-value. (2016 California Energy Code 150.0(j)1)
- A water heater located inside or above habitable space, 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 $1^{1/2}$ inches in depth.(2016 CPC 507.5)

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 should be reviewed. See the fuel gas pipe sizing handout available at the Building & Safety front counter. A listed flexible supply with a maximum length of 3 feet is required. Do not re-use an old flexible supply line or unsafe valve.

PROHIBITED LOCATIONS

Water heaters located in a bedroom or bathroom are required to

1) Be installed in a dedicated closet with a gasketed door assembly and be both self-closing and latching. The closing mechanism shall not have a hold-open feature. All combustion air shall be obtained from the outside. or; (2016 CPC 504.1(1))
2) The water heater shall be of the direct vent type (2016 CPC 504.1(2))
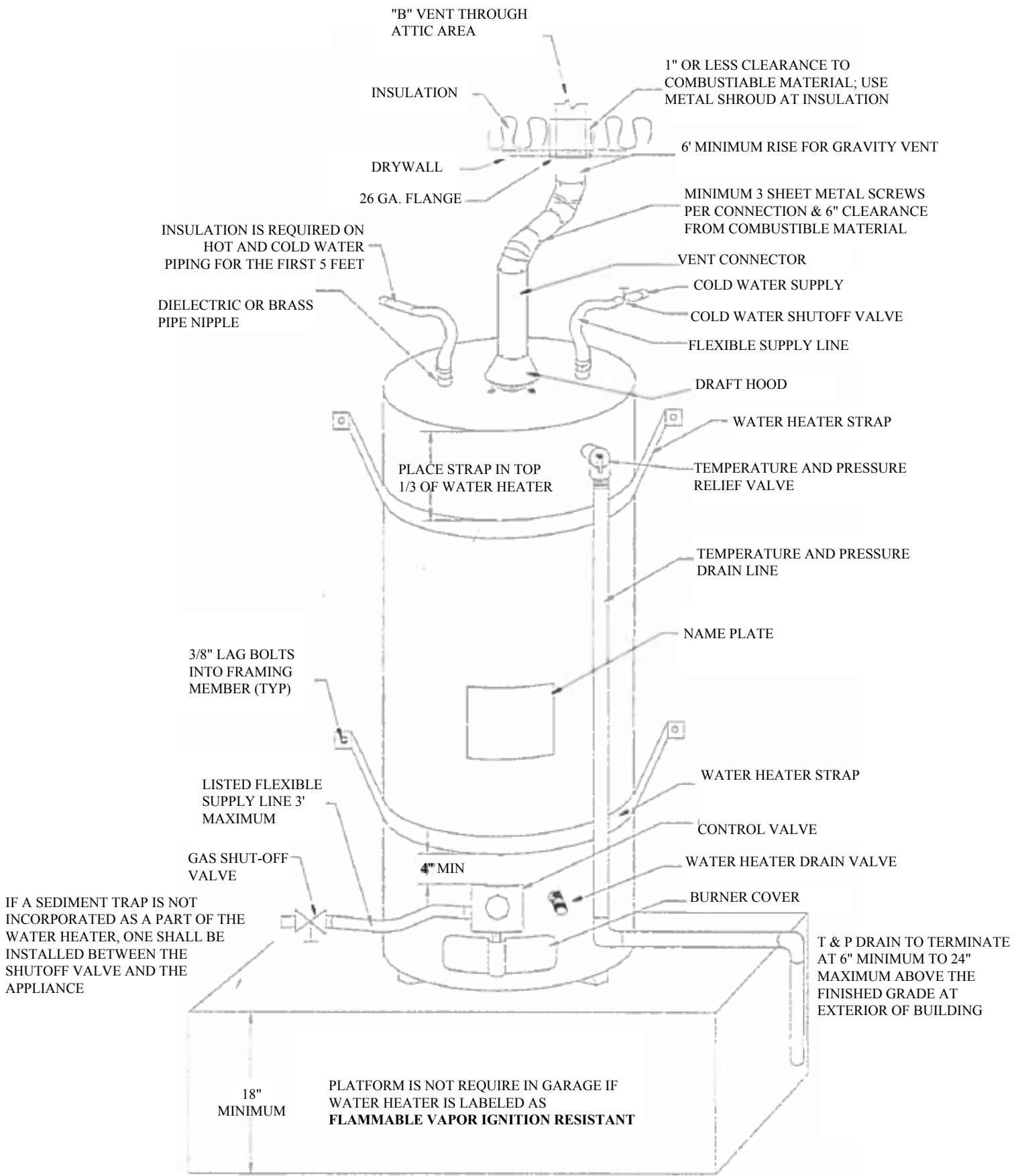
COMBUSTION AIR

Fuel burning water heaters must be provided with a sufficient supply of air to assure proper combustion of fuel. (2016 CPC 506.1) 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 in accordance with 2016 CPC sections 506.4. Openings must be a minimum of three inches in least dimension. They should be at least 10 ft. away from the return air inlet of a blower type furnace (2016 CMC 311.3).

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 as sole means of attachment. (2016 CMC 603.10/802.10.5)
- Single wall vent connectors must start and end in the same space as the water heater.
- No portion of the connector may be concealed within the construction of the building. (2016 CMC 802.7.3.2)
- 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. (2016 CMC 802.10.6)
- The total horizontal length of the vent system including vent and vent connectors must not exceed 75% of the vertical height of the vent. (2016 CMC 802.10.7.1)
- A gravity type venting system must terminate at least 6 ft. above the draft hood. (2016 CMC Table 803.1.2)
- Roof top vent termination must be 8 feet away from a vertical wall and extend 2 feet above the highest point where it passes through the roof. (2016 CMC 802.6.2)
- In multiple venting situations the vent size shall be determined per 2016 CMC Table 803.1.2
- Gravity and induced draft systems may not be interconnected unless a draft hood is present.

CLEARANCES

- Clearances for most water heaters can found in the provided manufacturer's installation instructions. (2016 CPC 504.3.1)
- Unlisted water heaters shall be installed with a clearance of 12" inches on all sides and rear. (2016 CPC 504.3.2)
- 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 18" above the floor unless it is listed as flammable vapor ignition resistant (2016 CPC 507.13) Note that electric water heaters with a switch and/or heating element located less that 18" above the base must also be elevated

"B" VENT THROUGH ATTIC AREA

INSULATION

1" OR LESS CLEARANCE TO COMBUSTIABLE MATERIAL; USE METAL SHROUD AT INSULATION

6' MINIMUM RISE FOR GRAVITY VENT

DRYWALL

26 GA. FLANGE

MINIMUM 3 SHEET METAL SCREWS PER CONNECTION & 6" CLEARANCE FROM COMBUSTIBLE MATERIAL

INSULATION IS REQUIRED ON HOT AND COLD WATER PIPING FOR THE FIRST 5 FEET

VENT CONNECTOR

COLD WATER SUPPLY

COLD WATER SHUTOFF VALVE

DIELECTRIC OR BRASS PIPE NIPPLE

FLEXIBLE SUPPLY LINE

DRAFT HOOD

WATER HEATER STRAP

PLACE STRAP IN TOP 1/3 OF WATER HEATER

TEMPERATURE AND PRESSURE RELIEF VALVE

TEMPERATURE AND PRESSURE DRAIN LINE

NAME PLATE

3/8" LAG BOLTS INTO FRAMING MEMBER (TYP)

LISTED FLEXIBLE SUPPLY LINE 3' MAXIMUM

WATER HEATER STRAP

CONTROL VALVE

GAS SHUT-OFF VALVE

WATER HEATER DRAIN VALVE

4" MIN

BURNER COVER

IF A SEDIMENT TRAP IS NOT INCORPORATED AS A PART OF THE WATER HEATER, ONE SHALL BE INSTALLED BETWEEN THE SHUTOFF VALVE AND THE APPLIANCE

T & P DRAIN TO TERMINATE AT 6" MINIMUM TO 24" MAXIMUM ABOVE THE FINISHED GRADE AT EXTERIOR OF BUILDING

18" MINIMUM

PLATFORM IS NOT REQUIRE IN GARAGE IF WATER HEATER IS LABELED AS **FLAMMABLE VAPOR IGNITION RESISTANT**