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Development Services Division**

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**Gas Water Heater Worksheet**

Information  
Bulletin

**PLG-03**

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## Permit Requirements

### When do I need a permit?

A water heater (plumbing) permit is always required for new and replacement water heater installations. This allows the Building Safety & Inspection field inspector to ensure safe operation and appropriate strapping.

During emergency situations when a water heater appliance has been installed without first obtaining a permit, it shall be obtained on the next work day following installation. A double fee permit penalty may otherwise be added for doing the work without a permit.

## Bracing and Installation

### Enforcement

As adopted by the City of Anderson, Chapter 15 of the 2016 California Plumbing Code (CPC) enforces the construction, location and installation of fuel burning water heaters.

### Location

Water heater installations in bedrooms and bathrooms shall comply with one of the following:

- 1) Fuel-burning water heaters may be installed in a closet located in the bedroom or bathroom provided the closet is provided with a listed, gasketed door assembly and a listed self closing device. All combustion air for such installations shall be obtained from the outdoors. The closet shall be for the exclusive use of the water heater.
- 2) Water heater shall be of the direct vent type.

### Protection

**Bollards** - When water heaters are located in the path of travel or subject to mechanical damage by

vehicles, a suitable barrier shall be installed in front of it.

### Strapping

In seismic design categories C, D, E and F, water heaters shall be anchored or strapped to resist movement during an earthquake. Straps are to be installed at the upper and lower third (1/3) of the water heater (lower strap 4-in above controls). The straps shall be connected so that the fasteners and straps cannot dislodge or loosen. Refer to page 2 for sample illustrations.

When supported on the ground, water heaters can rest on level concrete or other approved base extending not less than 3-in above adjacent ground level.

### Thermal Expansion

Any water system provided with a check valve, back flow preventer, or any other normally closed device that prevents dissipation of building pressure back into the water main shall be provided with an approved, listed, and adequately sized expansion tank to control thermal expansion.

### Capacity

The minimum capacity for water heaters shall be in accordance with the first hour rating as listed in the table below.

**Table 501.1(1): Water Heater Minimum Capacity (2016 CPC)<sup>1</sup>**

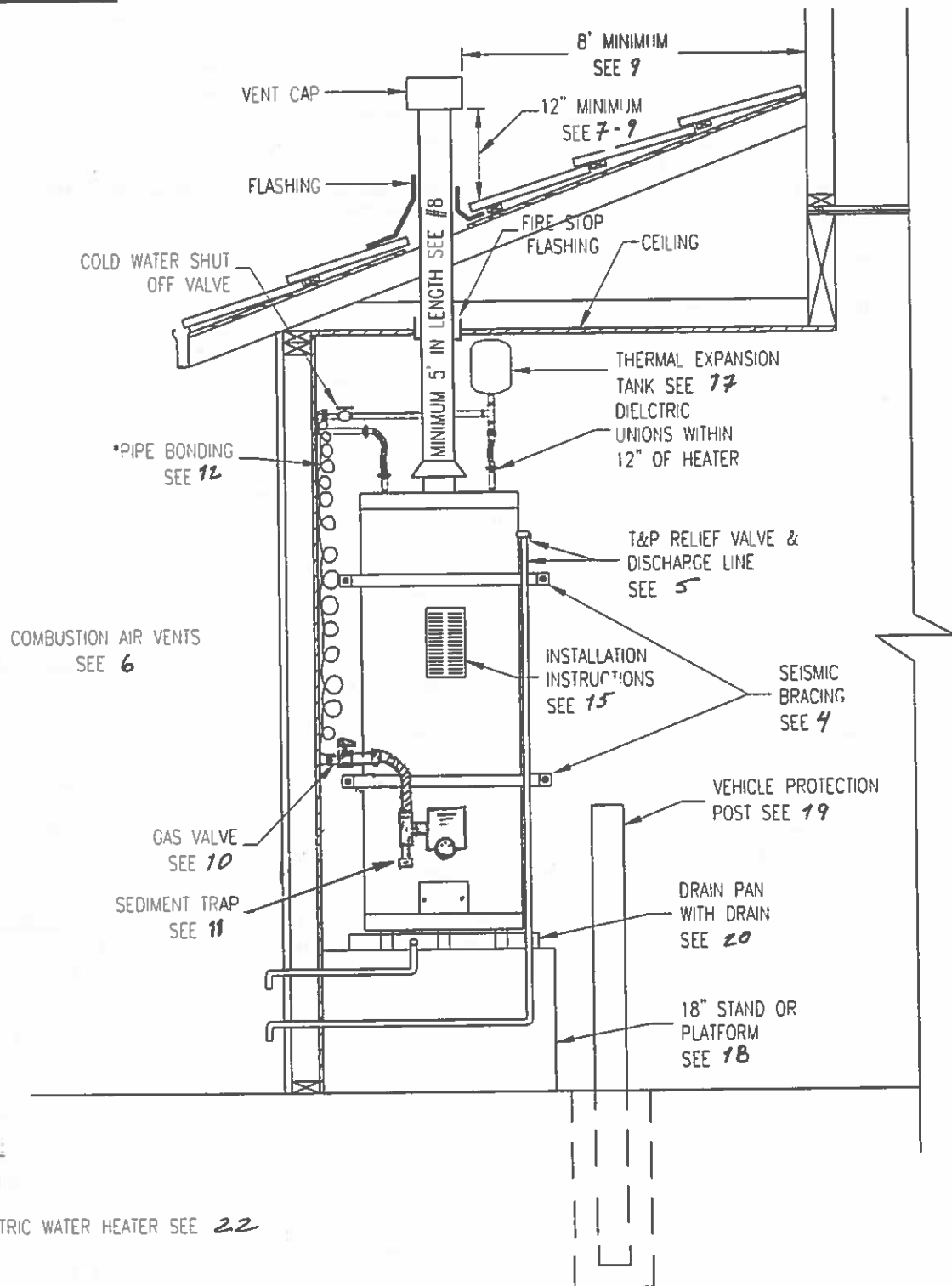
Number of Bathrooms	1 to 1.5			2 to 2.5				3 to 3.5			
	1	2	3	2	3	4	5	3	4	5	6
First Hour Rating <sup>2</sup> (Gallons)	42	54	54	54	67	67	80	67	80	80	80

### Notes:

<sup>1</sup>The first hour rating is found on the "Energy Guide" label.

<sup>2</sup>Non-storage and solar water heaters shall be sized to meet the appropriate first hour rating as shown in the table.

# GAS WATER HEATER INSTALLATIONS



1. **Permits are Required** for new and replacement water heaters. (2016 CPC Section 503.0)
2. **Inspection is Required** after the water heater is installed to verify compliance within the minimum safety requirements of the code regarding; location of water heater, combustion air, venting & vent cap, seismic protection/strapping, access and working space around water heater and other appliances, clearances to combustibles, gas piping supply with sediment trap and connections, temperature and pressure relief valve and surcharge piping to outside, water and gas hand shut off valves, water piping and connections, metallic piping continuously bonded, to meet required Energy Compliance and if required by location 18 inch elevation, vehicle damage protecting and drain pan with drain. (2016 CPC Section 504.2)
3. **Prohibited Locations** Fuel burning water heaters installed in bedroom or bathrooms shall be either; direct vent type, or in a closet that is vented to the outside, and used exclusively for the water heater. (2016 CPC Section 505.1)
4. **Seismic Bracing System** shall be installed to provide protection from displacement due to earthquake motion. Water heater shall be anchored or secured with a code approved restraint system consisting of strapping the upper and lower 1/3's of the water heater, minimum 4 inches above gas control valve. (2016 CPC Section 508.2)
5. **Temperature and Pressure Relief Valve & Discharge Line** Water Heaters shall be provide with a T & P relief valve and drain installed in compliance with the manufactures instructions and terminate not more than 2 feet nor less than 6 inches above the ground or flood level of the area receiving the discharge and terminate to the outdoors. The discharge line shall not be trapped or have a valve installed, and the terminating end shall not be threaded. (2016 CPC Section 505.6 and 608.5)
6. **Combustion Air Vents** within 12 inches of top and bottom of enclosure is required where enclosure has volume less than 50 C.F. per
  7. 1000 B.T.U./H of all appliances within enclosure. Minimum area per opening shall be based on 1 square inch per 4000 B.T.U./H of input capacity, with minimum screen mesh of a ¼ inch (2016 CPC Section 507) One vent within the upper 12 inches is allowed with restrictions. (2016 CPC Section 507.4)
8. **Venting System** shall be constructed, sized appropriately and installed to code and per manufactures installation instructions. (2016 CPC Section 510.10.3)
9. **Venting Clearance** Single wall metal vent connector piping shall be installed in a manor to provide 6 inch clearance from combustible materials and shall be secured together with Tek Screws or rivets. Single wall vent connector piping shall not be installed in a confined space, and only installed below fire stop flashing. Type "B" double wall vent piping shall be installed in a manor to provide 1 inch clearance from combustibles materials and shall not be secured together with Tek screws or rivets or tape. (2016 CPC Section 510.6 and 510.7)
10. **Vent Pipe Termination** shall not terminate less than 12 inches above roof, additional height required if roof pitch is greater than 6:12 slope, nor shall a vent terminate less than 8 feet from and second story exterior wall. Vents larger than 12" in diameter shall not terminate any less than 2 feet above any structure within 10 feet. Other rules may apply (See 2016 CPC Section 510.6.2)
11. **Gas Appliance Connectors** shall not be reused per manufacturer's installation instructions. Gas connectors shall be attached to a hand shut-off type gas valve and be properly sized to B.T.U. input rating of water heater. (2016 CPC Section 1212)
12. **Sediment Trap** shall be installed to gas supply at water heater control valve with a "T" fitting and a minimum 3 inch nipple in length with cap for sediment trap. (2016 CPC Section 1212.7)
13. **When Applicable Metallic Piping** to be bonded continuously with a copper bonding wire, sized per CEC Table 250.66, and bonding clamps, to cold and gas lines to tie systems together at water heater. (2016 CEC Section 250.104)
14. **Water Piping Insulation** shall be installed 8 feet on the cold and 8 feet on the hot water supplies at water heater when possible and to maintain 6 inches clearance from vent and flue. NOTE: if water heater has a re-circulation pump system the entire length of circulation piping loop will need to be insulated. (2016 California Energy Commission Mandatory Requirements)
15. **State Energy Regulations** requires the following: if the water heater has an EF of less than 0.58 and R-12 Water Heater blanket is required (internal insulation cannot be used to satisfy this mandatory requirement). For water heater with 0.58 EF or higher, no blanket is required. The blanket should be securely attached around the water heater. The top of the water heater should not be insulated and a cut out in the blanket should be provided for combustible air intake and controls. (2016 California Energy Commission Mandatory Requirements)
16. **Installation Instructions** for water heaters to be on site and readily available for reference. (2016 CPC Section 508.26)
17. **Working Platform** A level working surface not less than 30" X 30" shall be provided for service. (2016 CPC Section 509.4.4)
18. **Thermal Expansion Tank System** water piping systems equipped with backflow or pressure reducing device on the main shall require a thermal expansion tank to protect water heater and water piping system from excess pressure due to thermal expansion. (2016 CPC Section 608.3 and 2016 CMC Section 1005.0)
19. **Water Heater Stand** or built in platform is required when water heater is installed in garage to elevate burner a minimum 18" above grade. (2016 CPC Section 508.14) SCC 16.24.120
20. **Vehicle Protection** must be provided where subject to mechanical damage, post (2016 CPC Section 508.17)
21. **Drain-Pan** shall be required when a water heater and/or tank is installed in a location where it could cause damage; in case of failure/leak to floor, sub-floor, drywall. Drain pan shall be installed with a minimum ¾" drain outlet and discharge that drains to the exterior of the building or an approved location. (2016 CPC Section 508.4) Note: Discharge from a T&P relief valve cannot terminate into water heater drain pan. (2016 CPC Section 508.5)
22. **Electrical Water** Heater shall be provided with a disconnect. Electric water heaters require a disconnecting means within sight of, not exceeding 50 'from the appliance. (2016 CEC Section 422.31 (B)).