



Water Heater Replacement

INFORMATION GUIDELINE

January 2005

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WATER HEATER INSTALLATION AND REPLACEMENT

A plumbing permit is required for all water heater installations and replacements. A **final inspection is required after all work has been completed.** The following are water heater installation requirements from the 2001 California Plumbing Code.

Seismic Bracing (Section 510.5)

Water heaters require two seismic straps; one located within the top 1/3 of the water heater unit and one at the bottom 1/3. The bottom strap must be located at least 4" away from the water heater controls. See Diagram below

There are a number of seismic strap kits that are available commercially. Any platform supporting the water heater must be secured to the structure or the slab.

Pressure/Temperature Valve (Section 505.3)

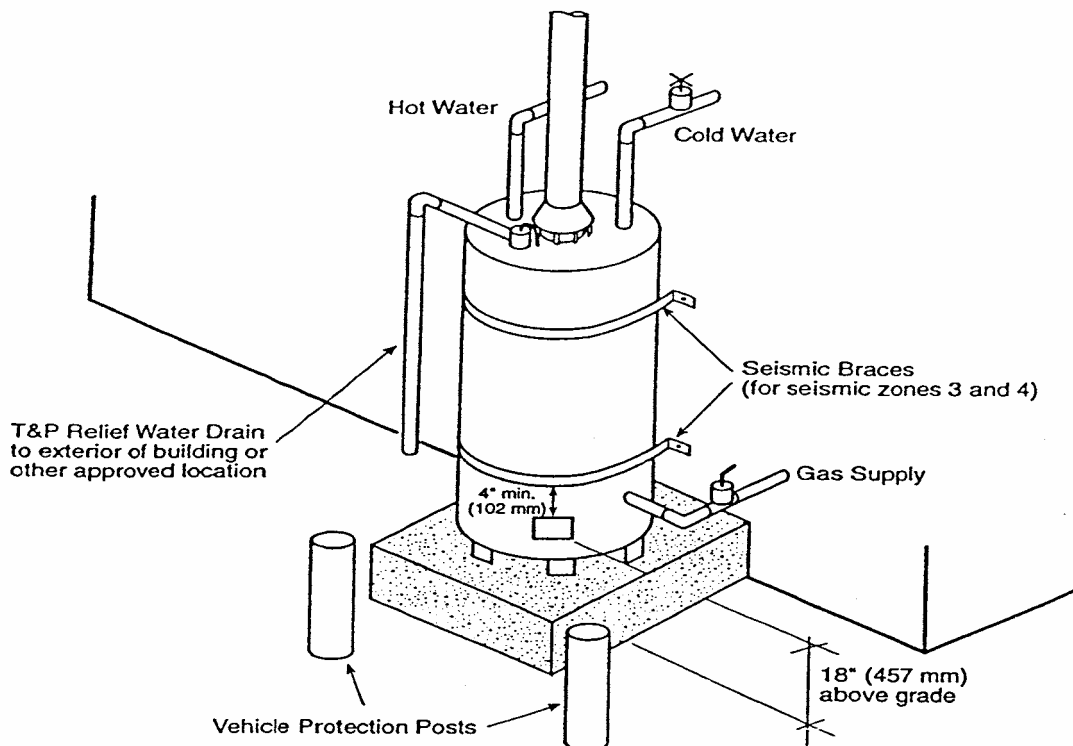
All water heaters have a pressure/temperature (P/T) valve. The valve shall be drained to the exterior and terminate toward the ground maintaining between 6" and 24" of clearance from the ground and pointing downward. The diameter of the valve opening (generally 3/4") must be maintained to the termination of the drain. Check the manufacturer's requirements. When approved by the Chief Building Official, such drain may terminate at other locations (i.e. laundry tub, floor sink, or floor drain). No part of such drain shall be trapped and the terminal end of the drain shall not be threaded.

Located in a Garage (Section 510.1, 510.3)

Water heaters located in a garage must be elevated so the pilot light and controls are at least 18" above the garage floor surface. If subject to damage, adequate barriers must be installed. See Diagram Below

Protection from Damage (Section 510.0)

All water heaters installed in areas where they may be subjected to mechanical damage shall be suitably guarded against damage. Water heaters in garages shall be suitably guarded against such damage by being installed behind adequate barriers or by being elevated or located out of the normal path of a vehicle using any such garage. See Diagram Below



Located in an Attic or Closet with Wood Framing Underneath (Section 510.7)

If located in an attic or furred space (i.e. closet) where leaking could cause damage to underlying wood framing, the water heater must be set in a pan constructed of water tight corrosion resistant material. The pan must be fitted with a minimum 3/4" drain that drains to an approved location. The P/T line is not allowed to terminate at this pan or be connected to it.

Prohibited Locations (Section 509.0)

No water heater which depends on fuel combustion for heat shall be installed in any room used or designed to be used for sleeping purposes, bathroom (a room equipped with a shower or bathtub), clothes closet, or in any closet or other confined space opening into any bath or bedroom. An exception to the above is a sealed combustion chamber-type and direct vent water heater, which is an approved type and installed in accordance with its conditions of approval. Electric water heaters are not subject to the above restrictions.

Combustion Air (Section 507.0)

Openings shall be located so that one combustion air opening extends within the upper 12 inches of the appliance enclosure and one combustion air opening extends with the lower 12 inches of the enclosure. Required combustion air ducts shall not be less than 3 inches in the least dimension. Openings shall terminate in a space at least 3 inches in depth open to the front of side of the appliance. Such space shall extend from the floor to the ceiling of the appliance enclosure. Openings shall have the same cross-sectional area as the free area of the openings to which they connect. Openings shall serve a single enclosure. Openings shall serve only upper or lower combustion air openings. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air.

Dampers – Combustion air ducts shall not be installed so as to pass through construction where fire dampers are required. Volume dampers shall not be installed in combustion air ducts.

Screen – Neither end of ducts which terminate in an attic shall be screened.

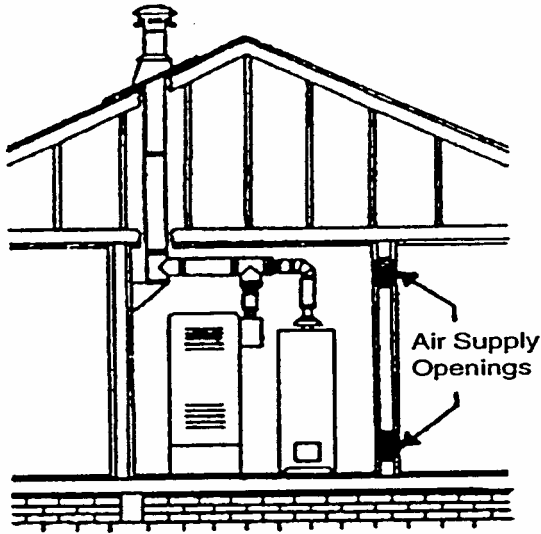
Louvers and Grilles (Section 507.4)

In calculating free area of all louvers and grilles, consideration shall be given to the blocking effect of louvers, grilles or screens protecting openings. Screens used shall not be smaller than ¼ inch mesh. The free area through a design of louver or grille shall be used in calculating the size opening required to provide the free area specified.

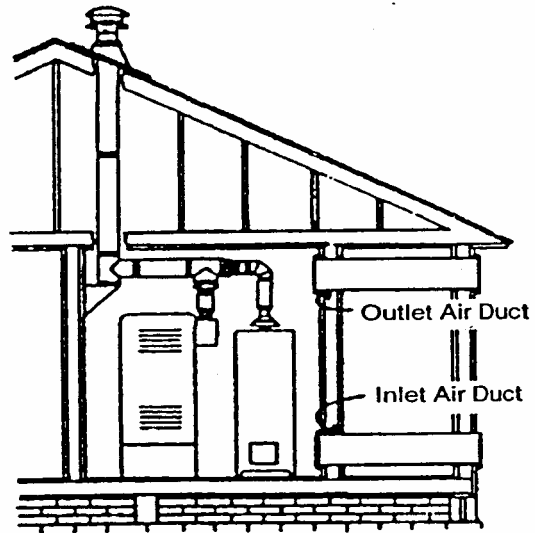
UPC TABLE 5-1 Size of Combustion Air Openings or Ducts ¹ for Gas or Liquid-Burning Water Heaters			
Column 1 Buildings of Ordinary Tightness		Column 2 Buildings of Unusually Tight Construction	
Condition	Size of Opening or Duct	Condition	Size of Opening or Duct
Appliance in unconfined ² space	May rely on infiltration alone.	Appliance in unconfined ² space: Obtain combustion air from outdoors or from space freely communicating with outdoors	Provide 2 openings, each having 1 sq. in. per 5,000 Btu/H input
Appliance in confined ⁴ space 1. All air from inside building	Provide two openings into enclosure each having 1 sq. in. per 1,000 Btu/h input freely communicating with other unconfined interior spaces. Minimum 100 sq. in. each opening	Appliance in confined ⁴ space: Obtain combustion air from outdoors or from space feely communicating with outdoors.	1. Provide two vertical ducts or plenums: 1 sq. in. per 4,000 Btu/H input each duct or plenum. 2. Provide two horizontal ducts or plenums: 1 sq. in. per 2,000 Btu/h input each duct or plenum. 3. Provide two openings in an each opening 1 sq. in. per 4,000 Btu/h input. 4. Provide 1 ceiling opening to ventilated attic and 1 vertical duct to attic: each opening 1 sq. in. per 4,000 Btu/h input. 5. Provide 1 opening in enclosure ceiling to ventilated attic and 1 opening in enclosure floor to ventilated crawl space: each opening 1 sq. in. per 4,000 Btu/h input
2. Part of air from inside building	Provide 2 openings into enclosure ³ from other freely communicating unconfined ² interior spaces, each having an area of 100 sq. in. plus one duct or plenum opening to outdoors having an area of 1 sq. in. per 5,000 Btu/h input rating.		
3. All air from outdoors: Obtain from outdoors or from space feely communicating with outdoors.	Use any of the methods listed for confined space in unusually tight construction as indicated in Column 2.		
1 For location of opening, see Section 507.3 2 As defined in Section 223.0 3 When the total input rating of appliances in enclosure exceeds 100,000 Btu/h, the area of each opening into the enclosure shall be increased 1 sq. in. for each 1,000 Btu/h over 100,000 Btu/h. 4 As defined in Section 205.0		Btu/hr	Watts
		1000	293
		2000	586
		4000	1172
		5000	1465
		100,000	29,300

Alternate Method of Supplying Combustion Air (Section 507.5)

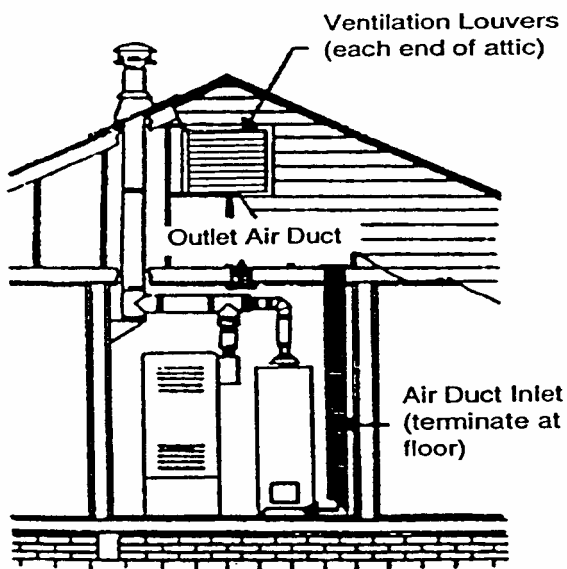
In lieu of the requirements of Table 5-1, combustion air supply may be designed in accordance with recognized engineering principles when first approved by the Administrative Authority. – See Table 5-1 above



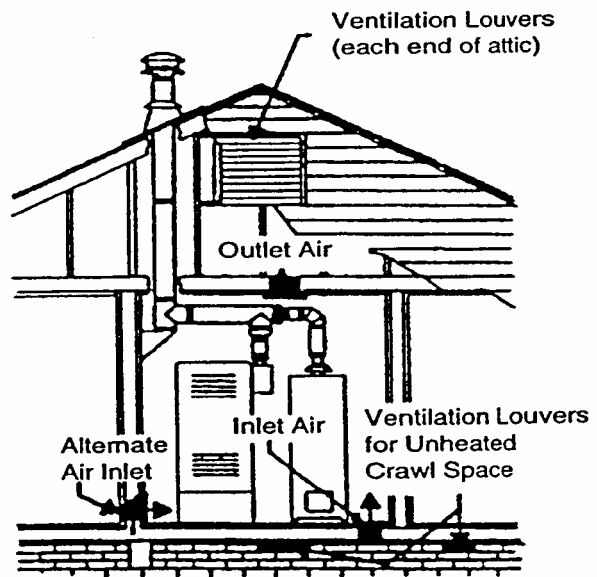
(A) All Air from Inside Building



(B) All Air from Outdoors



(C) All Air from Ventilated Attic



(D) Air in From Crawl Space, Out into Attic

Access and Working Space (Section 511.0)

Every water heater installation shall be accessible for inspection, repair, or replacement. The appliance space shall be provided with an opening or doorway of sufficient size to remove the water heater. In no case shall such opening or doorway be less than 24" in width. Such access shall be continuous and shall be one or any combination of the following:

By an opening or door, and passage not less than 24" in width and large enough to permit removal of water heater, but not less than 30" in height. Every attic, roof, mezzanine, or platform more than 8 feet above the ground or floor level shall be made accessible by a stairway or ladder permanently fastened to the building. Such a ladder or stairway shall not be more than 18 feet in length between landings and not less than 14" in width.

Exception: A portable ladder may be used for access for water heaters in attics on the single-story portion of a Group U, Division 1 or R Occupancy.

Venting (Section 512, 514.2, 515)

All single wall and single wall to double wall joints shall be secured with a minimum of three sheet metal screws, rivets or similar positive connection. The vent and the water heater must maintain clearance from combustible materials such as wall framing or roofing. Generally the minimum distances is 6" for single wall and 1" for double wall and the water heater, but check the manufacturers listing on the materials. The vent shall terminate a minimum 6" above the roof through flashing at the roof and terminate in a listed and approved vent cap. Vents may require additional supports depending on the material and design.

Vent Connector - (Section 514.0) See Diagram Below

That portion of a venting system which connects an appliance vent collar to its vent. Vent connectors used for gas water heaters with draft hoods may be of Type B or Type L vent material or noncombustible materials having resistance to corrosion not less than that of galvanized sheet steel and minimum thickness specified in 523.2. Single wall metal vent connectors shall be fastened with sheet metal screws or rivets and be adequately supported. Single wall vent connectors must be located in the same room as the appliance. A connector may not pass through walls, floors or ceilings or originate in attics or concealed spaces.

Clearances (Section 508.0)

Clearances of listed appliances from combustible materials shall be as specified in the listing or on the rating plate.

